The Impact of Capital Structure on Banks' Profitability in Africa

Ebenezer Bugri Anarfo
GIMPA Business School

Elijah Appiahene
GIMPA Business School

This paper investigates the impact of capital structure on the profitability of banks in Africa. Using dynamic panel regression robust analysis and data from 37 countries in SSA, the study employed the Debt Ratio (DR) as a measure of capital structure; whereas banks' profitability was measured using Risk Adjusted Return on Asset (RAROA), Risk Adjusted Return on Equity (RAROE) and Net Interest Margin (NIM). The findings suggest that, banks' capital structure is a driver of profitability. Other variables that significantly influence banks' profitability are size, tangible asset, growth, taxes and interest rate.

INTRODUCTION

The increasing spate of globalization coupled with an ever increasing dependence on the financial sector has cumulated in a fiercely competitive global financial sector. Beck & Cull (2013) argued that accelerated growth coupled with expansion of access to financial services has allowed the banking sector in Sub-Saharan Africa to undergo significant changes over the last two decades. Tough regulations and the exercise of immense caution that came about due to the recessionary effects of the global credit crunch means banks are having to cope with strenuous conditions in their attempt to boost their profitability, expand their network and client base to survive. This has led most banks to look inwardly in their efforts to boost profitability. Amongst the internal factors believed to influence a firm's profitability is capital structure and its impact on firm profitability. Empirical studies over the years have not been able to conclude with certainty the impact of capital structure on a firm's profitability. Whereas some studies have found both positive and negative effects (Saeedi & Mahmoodi, 2011; Tsangyaa et.al., 2009; Oke and Afolabi, 2008; Zeitun & Tian, 2007; Abor, 2005); others have simply found negative effects only (Toraman *et al.*, 2013; Babalola, 2012; Mohamad & Abdullah, 2012; Muritalia, 2012), and positive effects only (Saeed et al., 2013; Nawaz et al., 2011; Davide & Olorunfemi, 2010). Thus, Cole et al. (2015), concluded that the relationship between capital structure and firm profitability remains a controversial issue in the area of corporate finance. The need for continuous empirical studies into the nature of the relationship between capital structure and firm profitability therefore cannot be overemphasized. Moreover, in an industry where firms (banks) have focused their attention on enhancing profitability and growth by improving internal efficiencies, a study into the empirical effects of capital structure on bank profitability is of high relevance in today's global world.

By definition, capital structure refers to the combination of debt and equity financing that makes up the sources of funds for a firm. The choice between debt and equity financing in the theory of capital

structure has been associated with the theoretical position that, there is an optimal level of capital structure at which a firm's weighted average cost of capital is at its lowest. Notwithstanding, in the real world, the presence of such optimality has been nothing short of abstract, whereas the decision to use debt over equity or equity over debt has been linked to a firm's financing decision (Cole et al., 2015).

Closely associated with the expected relationship between capital structure and profitability is the positive impact of leverage which includes tax benefits and also as a tool to monitor managerial behaviour. Naturally, firms tend to prefer the use of debt funding due to the fact that it does not result in shareholder dilution of voting right, whereas the interests paid on debts are tax deductible. However, the decision to use debt or equity is not a clear cut decision; primarily, when one takes into account the cost of distress associated with high leverage, the possibility of loss of control, amongst others which make the use of debt less attractive. Most global empirical studies that have investigated the relationship between capital structure and firm profitability used single country case studies (Cole et al., 2015; Saeed et al., 2013; Salim & Yadav, 2012; Pathak, 2011). Likewise, multi-country studies investigating this relationship in Sub-Saharan Africa have been largely non-existent, with most of these studies focusing on single-country studies (Muritala, 2012; Babalola, 2012; Ofori-Dankwa & Julian, 2013). Thus, there is still the need for further studies to establish the relationship between capital structure and firm profitability using a cross country study to contribute positively to the empirical literature on capital structure and firm profitability and that is what this study seek to do. That is, the study investigates the impact of capital structure on banks profitability in sub-Saharan Africa by testing the following hypothesis:

H_0: There is no relationship between capital structure and banks' profitability in Africa.

H_1: There is a relationship between capital structure and banks' profitability in Africa.

Our Paper contributes to the capital structure and firm profitability debate in three ways: First, this paper is the first study to examine the relationship between capital structure and banks performance (profitability) using a cross-country data in Africa. Secondly, this paper is first to use risk adjusted returns such as the risk adjusted return on asset (RAROA) and the risk adjusted return on equity (RAROE) as profitability measures instead of the conventional ROA and ROE that is used by other studies. ROA and ROE are not accurate measures of profitability because they are not adjusted for risks taken by the firm in earning profit. Lastly, this paper contributes to the literature by examining the problem of endogeneity that might exist between capital structure and banks profitability; that is, there could be a bi-directional relationship between capital structure and banks profitability. However, the study finds no evidence of endogeneity base on the granger causality table.

The rest of this paper is organized as follows. In section 1, we present an introduction of capital structure and banks profitability nexus. Section 2 presents both theoretical and empirical literature review on capital structure, Section 3 discusses the empirical models and methodology. Section 4 presents the data analysis and discusses the results. Section 5 presents the summary and implications of our findings.

LITERATURE REVIEW

The theory of capital structure traces back to the original works of Modigliani & Miller (1958) whose position was that capital structure is irrelevant to firm's performance when we have perfect capital markets with no transaction cost and taxes. By their theory, leverage has no effect on profitability since the use of debt or equity financing simply identifies the sources of funds available to a firm and that does not in any way influence the value of a firm. Over time, their irrelevance theory was criticized for ignoring taxation and that their assumption of perfect capital markets is not real.

The introduction of corporate taxes into the M&M irrelevance theory eventually resulted in the development of the trade-off theory (Iqbal et al., 2012). The trade-off theory sought to identify an optimal capital structure where tax shield from debt equals bankruptcy cost. Thus, the theory posits that a firm's choice of debt to equity is a trade-off between its tax shield and the costs of bankruptcy (Anarfo, 2015). The benefits of corporate taxation for a levered firm is dependent on the fact that interest payments are tax deductible – hence, they reduce a firm's tax burden (Jahanzeb et al., 2014). On the other hand, the costs associated with leverage is the probability of financial distress as a result of a firm taking on higher levels

of debts with its associated high interest payments. Thus, tax savings (shield) when matched against the costs of leverage, should off-set each other until a point where the benefits equals the costs, at that point the weighted average cost of capital will be at its minimum and a firm will have reached its optimal capital structure. Thus, proponents of the theory argue that there is a limit to the amount of leverage a firm can assume although this differs for individual firms and industries depending on factors such as profitability, size, composition of assets, risk, growth, amongst others (Ganguli, 2013).

Contrary to the trade-off theory, another theory that altered significantly the current understanding of capital structure is the pecking order theory developed by Myers & Majluf (1984), based on an earlier study by Donaldson in 1961. The theory was developed based on the signaling hypothesis. The theory posits that issuance of new shares to raise funds for a new project implies such shares must be issued at a price below the prevailing market price, which may give an indication that a firm's shares are overvalued and raise questions regarding managements' ability. This could in turn have significant adverse effects on the firm's stock price as investors seek to offload their shares. On the other hand, the use of debt financing gives a positive signal that management are confident of the future prospects of the firm and will be able to meet debt obligations in the future (Ganguli, 2013). However, the issues relating to pricing of debt including the level of interest means that firms will prefer to look internally for financing options primarily from its retained earnings, which is cheaper than the use of debt. Hence, the theory identifies a financing order, where firms will first of all resort to the use retained earnings; however, in the event that there is the need for external financing, debt financing will be preferred. Thus, this theory posits that there is no optimal capital structure (Janzeeb et al., 2014). However, it has been argued that the pecking order theory begins with equity financing and ends with the same, forwarding the argument that retained earnings are profits belonging to shareholders thus making it a form of equity financing (Janzeeb et al., 2014).

A relatively new theory of capital structure was advanced by Baker & Wurgler (2002). The market timing theory, as it is called, suggests that a firm's financing decision is not a straight-forward order as posited by the pecking order theory, and that the choice of one form of financing over another is dependent on prevailing market conditions. Thus, the theory argues that managers take advantage of circumstances that may arise to issue equity and minimize leverage pressures. Setyawan (2011) concludes, based on studies by Dahlan (2004) and Kusumawati & Danny (2006), that the core concept of the market timing theory implies that the decision to opt for debt and equity finance at various points in time matters more than identifying the optimal leverage point. From this view point, two major timing references have been discussed: investors' sentiment and financial distress (Saad, 2010). Hence, it is argued that where the firm is facing financial distress (or has a high probability of distress), managers will prefer to issue equity to avoid the possibility of bankruptcy; whereas in the event stock prices are overvalued, they will prefer debt financing due to the adverse signal of equity issues.

Empirically, various studies have investigated the impact of capital structure on firm profitability. For instance, Cole et al. (2015), examined the relationship between capital structure and firm profitability in the Industrial, Health and Energy Sectors in the US. They found an adverse relationship between capital structure and firms' profitability across all three sectors. This finding was contrary to other western-based studies that had found positive relationships. Similarly, Chadha & Sharma (2015) studied the impact of capital structure on firm profitability using 422 Indian manufacturing firms listed on the Bombay Stock Exchange. Using a ten-year data period ending 2002/2013, they found no relationship between capital structure and ROA and Tobin's Q, whereas an adverse relationship was observed between capital structure and ROE.

Toraman et al. (2013) also investigated the relationship between capital structure and financial profitability of 28 manufacturing firms in Turkey from 2005 to 2011. They found an adverse relationship between capital structure and profitability. Their findings were no different from Salim & Yadav (2012) who also investigated capital structure and its impact on firm profitability using 237 firms listed on the Bursa Malaysia Stock Exchange and data from 1995 to 2011. Their study adopted four profitability measures (ROE, ROA, Tobin's Q and EPS) and five capital structure measures. They found an adverse relationship across all industries between capital structure and profitability. Pathak (2011) also

investigated the relationship between debt level and firm profitability and found an adverse relationship; the results were consistent with findings from studies in Asian countries. Other studies that found adverse relationship between capital structure and profitability include Muritala (2012) whose study was centred in Nigeria using 10 firms and data from 2006 to 2010; Mohamad & Abdullah (2012), whose study used data from 2002 to 2010 for 30 Malaysian companies; and Babalola (2012), whose investigation was centred in Nigeria using 10 firms from 2000 to 2009.

A number of empirical studies have also found positive relationships; for instance, Arbiyan & Safari (2009) investigated the effect of capital structure on firm profitability using 100 listed Iranian firms from 2001 to 2007; they found evidence of a positive relationship between short-term debt and profits (using ROE as proxy) whereas an adverse relationship was observed between long-term debt and profits. Similarly, Saeed et al. (2013) studied the impact of capital structure on bank profitability using 25 banks in Pakistan over the period 2007 to 2011. They measured profitability using return on assets, return on equity and earnings per share; and measured capital structure using long-term debt to capital ratio, short-term debt to capital ratio and total debt to capital ratio. They observed a positive relationship between capital structure and firm profitability. Furthermore, Nawaz et al. (2011) examined the nature of the relationship between capital structure and firm profitability using 173 textile firms in Pakistan from 2000 to 2009 and found a positive relationship. Thus, empirical findings remain inconclusive regarding the effect of capital structure on profitability of firms.

THEORETICAL FRAMEWORK AND METHODOLOGY

A number of factors have been identified in previous empirical studies as determinants of banks' profitability which include; the debt ratio, firm size, asset tangibility, growth rate of assets, corporate tax rate and some of these control for macroeconomic variables such as GDP growth rate, interest rate and inflation rate.

Profitability Measures

The pecking order theory of capital structure seems to suggest that there is a negative relationship between a firm's capital structure and profitability. Murinde et al (2004) observe that retained earnings are the principal source of finance. According to Titman and Wessels (1988) and Barton et al. (1989), firms that have higher profits would maintain a low debt ratio since they are able to generate those funds internally "all other things being equal". Evidence from empirical studies seems to support the pecking order theory. Other studies that have found a negative relationship between profitability and capital structure include Frend and Lang (1988), Barton et al. (1989). Cassar and Holmes (2003), Esperanca et al, (2003) and Hall et al. (2004). Some researchers such as Bettis and Hall (1982), Demsetz and Lehn (1985), Habib and Victor (1991), Zeitun and Tian (2007) among others, used return on Assets (ROA) and return on equity (ROE) as proxies for firm's profitability in their studies.

However, this study deviates from the conventional profitability measures used by other empirical studies and adopts the risk adjusted return on assets (RAROA), the risk adjusted return on equity (RAROE), and the net interest margin as measures of profitability. This is because risk adjusted returns take into account the risk that the bank bears in earning profit. These measures of profitability are the dependent variables and they are briefly discussed below:

Risk Adjusted Return on Assets (RAROA)

Return on asset is very important measure of banks' profitability. It is computed by dividing net income by total assets. Return on assets (ROA) indicates how much profit each asset generates (Hassoune, 2002). One of the main problems with using the ROA as profitability measure is that, it does not account for the risk that is taken to earn the profit on assets. A bank could obtain a high profit level by taking higher level of risk. The ROA could be very high in such a case, but on risk adjusted basis it could reflect a relatively poor profitability. It is for this reason that this study uses the risk adjusted return on

asset (RAROA) unlike other studies that use return on assets (Bashir and Hassan, 2004 and Naceur, 2003).

Risk Adjusted Return on Equity (RAROE)

Return on equity (ROE) indicates how much profit the bank has generated using shareholder's equity. It measures the profit of the bank as a percentage of shareholder's equity. It is computed by dividing net income by total shareholders' equity. ROE shows how efficiently and effectively the bank management has invested shareholders' money. One of the main drawbacks of ROE is that, as a profitability measure, it does not account for the risk that is taken to earn the profit on equity. Clearly, a bank could obtain a high profit by taking higher level of risk to earn e.g. trade income. The ROE could be very high in such a case, but on risk adjusted basis it could reflect a relatively poor profitability. It is for this reason that this study uses the risk adjusted return on equity (RAROE) unlike other studies that use the return on equity (Hassoune, 2002, Bashir and Hassan, 2004).

Net Interest Margin (NIM)

Net Interest Margin is the difference between interest income on loans and other interest-earning assets less the cost of funds – based on sources of funds and liabilities – expressed as a percentage of interest bearing assets. NIM measures how profitable a bank is in terms minimizing its interest expense and maximizing its interest revenue. The higher the NIM for a bank, the more profitable it is. A bank can increase its NIM by maximizing its interest revenue and minimizing its interest expense. Naceur (2003) includes NIM as a profitability measure.

Granger Causality Test

There is a possible endogeneity problem between capital structure and bank profitability and hence there could be a reverse causality. This means that, the relationship between capital structure and banks profitability could be bidirectional. The Granger Causality test is used to test for the presence of reverse causality. The general notation of a Granger Causality test which seeks to determine whether lagged terms of X predict Y and whether lagged terms of Y predict X respectively are specified as follows.

$$Y_t = \propto_0 + \propto_1 Y_{t-1} + \propto_2 Y_{t-2} + \cdots + \propto_p Y_{t-1} + \cdots + \beta_p X_{t-p} + e_i \quad (1)$$

$$X_t = \beta_0 + \beta_1 X_{t-1} + \beta_2 X_{t-2} + \cdots + \beta_p Y_{t-1} + \cdots + \beta_p Y_{t-p} + u_i \quad (2)$$

Where p is the number of lags, e_i and u_i are error terms. Equation 1 tests whether X Granger causes Y, whereas equation 2 tests whether Y Granger causes X. If βeta (β) is significant and not equal to zero (0), we can say that Y Granger causes X and vice versa. The Granger – causality model is specified as follows.

$$RAROA = \propto_0 + \propto_1 RAROA_{t-1} + \propto_2 RAROA_{t-2} + \cdots + \propto_p DR_{t-1} + \cdots + \beta_p DR_{t-p} + ei \quad (3)$$

$$DR = \beta_O + \beta_1 DR_{t-1} + \beta_2 DR_{t-2} + \cdots . + \beta_p RAROA_{t-1} + \cdots . + \beta_R RAROA_{t-p} + u_i \quad (4)$$

$$RAROE = \propto_O + \propto_1 RAROE_{t-1} + \propto_2 RAROE_{t-1} + \cdots . + \propto_p DR_{t-1} + \cdots + \beta_p DR_{t-p} + e_i \quad (5)$$

$$DR = \beta_0 + \beta_1 DR_{t-1} + \beta_2 DR_{t-2} + \cdots . + \beta_p RAROE_{t-1} + \cdots + \beta_p RAROE_{t-1} + u_i \quad (6)$$

$$NIM = \propto_O + \propto_1 NIM_{t-1} + \propto_2 NIM_{t-1} + \cdots . + \propto_p DR_{t-1} + \cdots + \beta_p DR_{t-p} + e_i \quad (7)$$

$$DR = \beta_0 + \beta_1 DR_{t-1} + \beta_2 DR_{t-2} + \cdots . + \beta_p NIM_{t-1} + \cdots + \beta_p NIM_{t-1} + u_i \quad (8)$$

If there is reverse causality between capital structure and bank profitability, this study will resort to simultaneous equations models. The simultaneous equations models are regression models in which there is more than one equation and there are feedback relationships among variables (in our case, capital structure and bank profitability). If there is a simultaneity problem and the model is estimated like a single equation case, this will result in simultaneous equation bias and the results will be bias and inconsistent. If reverse causality exists, this study shall employ indirect least squares (ILS), instrumental variables (IV) and the two stage least squares (2SLS) if the model is over identified to estimate the parameters in order to resolve the simultaneity problem. If there is no reverse causality, the study will resort to the panel regression models specified in the methodology.

Research Methodology

This study will use dynamic panel regression robust analysis to estimate the parameters. The use of panel data is advantageous because of the several data points, more accurate inference of model parameters and because it contains more degrees of freedom and more sample variability than cross-sectional data. It may be viewed as a cross-sectional data which is a panel with T = 1, or time series data which is a panel with N = 1, hence improving the efficiency of econometric estimates. Collinearity among the explanatory variables is reduced leading to an improvement of economic efficiency and an increase in the predictive power of the model (Hsiao et al., 1995).

Data Type and Sources

Panel data on banks from 37 countries in the Sub-Saharan region for the period 2009 to 2015 was used. The data is a secondary data obtained from the Price Water House Coopers Annual Banking survey. The criteria used for selecting the banks in each country was based on the availability and quality of data for the period.

Model Specification

The main independent variable used in this study is the debt ratio (DR). However, there are a number of other factors that influence and determine banks' profitability known as the controlled variables which are also included in this study. The controlled variables used in this study includes firm's size, asset tangibility, growth rate of firm's assets, marginal corporate tax, GDP growth rate, interest rates and inflation rates. The dependent variables are the measures of profitability (RAROA, RAROE and NIM). The model is therefore specified as;

$$Y_{it} = \beta_0 + \beta \sum X_{it} + e_{it} \quad (9)$$

With the subscript (i) denoting the cross-sectional dimension and t representing the time series dimension. The left hand-side variable represents the dependent variable in the model which is banks' profitability; X_{it} represents the independent variables in the estimation model; β_i is the coefficients which is constant overtime (t) and specific to the individual cross-sectional unit (i). The model can generally be specified as:

$$Y_{it} = \beta_o + \beta_{it} DR_{it} + \beta_{it} \sum_{i=1}^{n} Z_{it} + e_{it} \quad (10)$$

Where: $Y_{it} - the\ dependent\ variables\ RAROA, RAROE, NIM\ and\ AQ$

$DR_{it} - the\ independent\ variable\ (DR)$

$Z_{it} - the\ controlled\ variables\ i.e\ size, Asset\ tangibility, growth$

$e_{it}\ is\ the\ error\ term, it\ is\ assumed\ to\ have\ zero\ mean\ and\ constant\ variance$

Empirical Model

$$RAROA_{it} = \beta_0 + \beta_1 DR_{it} + \beta_2 SIZE_{it} + \beta_3 TANASSETS + \beta_4 GROWTH_{it} + \beta_5 LNTAX_{it} + \beta_6 INTERATE_{it} + \beta_7 GDPGR + \beta_8 INFLRATE_{it} + e_{it} \quad (11)$$

$$RAROE_{it} = \beta_0 + \beta_1 DR_{it} + \beta_2 SIZE_{it} + \beta_3 TANASSETS + \beta_4 GROWTH_{it} + \beta_5 LNTAX_{it} + \beta_6 INTERATE_{it} + \beta_7 GDPGR + \beta_8 INFLRATE_{it} + e_{it} \quad (12)$$

$$NIM_{it} = \beta_0 + \beta_1 DR_{it} + \beta_2 SIZE_{it} + \beta_3 TANASSETS + \beta_4 GROWTH_{it} + \beta_5 LNTAX_{it} + \beta_6 INTERATE_{it} + \beta_7 GDPGR + \beta_8 INFLRATE_{it} + e_{it} \quad (13)$$

RESULTS AND DISCUSSION

Unit Root Test

The study employed STATA 11.2 package to carry out two panel unit root tests (Levin-Lin-Chu and Im-pesaran-shin) in order to determine whether the variables used to test for reverse causality using the Granger causality method are stationary. To test for reverse causality by Granger causality method, the variables used must be stationary. The variables used were all stationary at levels and hence they are integrated of order zero I (0) stochastic process.

Reverse Causality

To examine reverse causality, Granger causality test was carried out using Eviews 7 to determine whether capital structure Granger causes bank profitability or it is bank profitability that Granger causes capital structure of banks in sub-Sahara Africa. According to the results obtained in table 1 below, there is no reverse causality or Granger causality between capital structure and bank profitability. This implies that, the problem of endogeneity does not exist between capital structure and banks profitability in Sub-Sahara Africa. Results are presented in Table 1 below.

TABLE 1
GRANGER CAUSALITY TEST

Null Hypothesis	Observation	F-Statistic	Prob.
RAROA does not Granger Cause DR	150	2.047	0.064
TDR does not Granger Cause ROA	150	1.458	0.197
RAROE does not Granger Cause DR	150	1.030	0.409
TDR does not Granger Cause RAROE	150	1.784	0.107
NIM does not Granger Cause DR	150	2.954	0.009
TDR does not Granger Cause NIM	150	0.827	0.551

Descriptive Statistics

Table 2 below shows the descriptive statistics of all the variables used in the study. The mean of the RAROA of the sample banks is 0.63 while that of the RAROE and NIM is 1.005 and -0.2429 respectively. The results indicate that on the average, for every dollar worth of total assets of the banks, $0.63 was earned as profit after tax after adjusting for risk, whiles $1.005 was earned as profit after tax on every equity share issued after adjusting for risk. However, the mean net interest margin (NIM) is negative indicating that the banks interest expense far exceeds their interest income. The analysis showed that the selected banks have high risk adjusted profitability ratios except that of the net interest margin. The mean total debt ratio is 24.72 and size is 8.77. The mean tangible assets are 0.0421, this means that the proportion of the firms fixed asset to total asset is about 4.2%. Growth rate of the banks on the average is 0.1299, average tax rate of banks in Africa is 29.53%, and the mean GDP growth rate of African countries is 4.70%. The mean interest rate on loans and inflation rate is 9.80% and 16.2% respectively.

TABLE 2
DESCRIPTIVE STATISTICS OF VARIABLES

Variable	Observation	Mean	Standard Deviation	Minimum	Maximum
RAROA	1043	0.632	1.002	-13.630	11.933
RAROE	1044	1.006	1.763	-18.856	16.410
NIM	1050	-0.243	3.843	-71.581	0.279
DR	1033	1.06e+07	2.23e+08	-2.96e+07	6.69e+09
TANASSETS	1050	0.421	0.034	0.00008	0.329
SIZE	1050	8.772	2.909	-0.105	14.349
GROWTH	1049	0.130	48.401	-1462.071	237.313
TAX	1050	29.530	4.777	20.000	40.000
INTERATE	1050	9.798	12.701	0.854	203.375
GDPGR	1050	4.703	3.880	-16.995	27.462
INFLRATE	1050	16.211	60.970	-9.616	1096.68

DR=Debt ratio TANASSETS= asset tangibility SIZE=Size of the bank GROWTH= growth rate of total assets RAROA=Risk Adjusted Return on Asset RAROE=Risk Adjusted Return on Equity NIM=net interest margin TAX=corporate marginal tax rate GDPGR=GDP growth rate INTERATE= interest rate on loans INFLRATE= inflation rate

Correlation Analysis

Due to the problem of multicollinearity among variables, a correlation matrix of the variables used in the regression is presented in Table 3. With regards to the debt ratio, its correlation with the other variables used in the study is not significant. The risk adjusted return on equity (RAROE) significantly correlates with all the variables except GROWTH. GDP growth rate, inflation rate and the net interest margin are significantly correlated. The risk adjusted return on asset (RAROA) exhibits a significant positive correlation with interest rate and inflation rate. Tangible asset significantly correlates with size, tax, interest rate and the inflation rate.

TABLE 3
CORRELATION MATRIX OF ALL VARIABLES USED IN THE STUDY

	RAROA	RAROE	NIM	DR	TANASSETS	SIZE	GROWTH	TAX	INTERATE	GDPGR	INFLRATE
RAROA	1.00										
RAROE	0.24*	1.00									
NIM	-0.04	-0.09*	1.00								
DR	0.01	0.01	0.00	1.00							
TANASSETS	-0.07*	-0.13*	-0.01	-0.02	1.00						
SIZE	-0.11*	-0.10*	0.15*	0.06	0.07*	1.00					
GROWTH	0.09*	0.01	0.04	-0.00	-0.02	0.10*	1.00				
TAX	0.04	0.08*	-0.03	0.01	0.19*	-0.00	-0.01	1.00			
INTERATE	0.35*	0.24*	-0.12*	-0.02	0.15*	-0.25*	-0.03	0.17*	1.00		
GDPGR	0.01	-0.07*	0.13*	0.02	0.03	0.02	-0.01	0.08*	-0.17*	1.00	
INFLRATE	0.29*	0.19*	-0.07*	-0.01	0.18	-0.06*	-0.04	0.10*	0.80*	-0.22*	1.00

Regression Results and Discussion

The regression results of the profitability variables regressed on the main independent variable (debt ratio) and the controlled variables are shown in Table 4 below. The result indicates that, the debt ratio (DR) is statistically significant in determining the RAROA, RAROE and NIM at 1%, 0.1% and 10% respectively. However, the coefficient of capital structure (Debt ratio) is negative. This implies that, higher debt ratios reduces banks profitability in Africa and this is consistent with other studies that found a negative relationship between capital structure and firms profitability (Toraman et al, 2013 Salim & Yadav , 2012 Pathak, 2011 Muritala , 2012 Mohamad & Abdullah ,2012). Size is statistically significant in influencing the RAROE and NIM but not significant in determining the RAROA. The coefficient of Size is negative and this means that, as the size of banks increase their profitability reduces this may be due to diseconomies of scale. This result is not consistent with other empirical studies that found size to have a positive influence on firms' profitability (Babalola, 2013. Abor, 2008).

Asset tangibility (TANASSET) is statistically significant at 5% in determining RAROA but not significant in determining RAROE and NIM. The coefficient of tangible assets is negative and this is not consistent with other studies that found tangible assets to have a positive influence on firm profitability (Bradley et al. 1984). This might be due to the fact that banks are not really using their tangible assets to enhance their profits. The growth rate of banks' assets is also statistically significant at 10% in influencing RAROE but not statistically significant in influencing RAROA and NIM. The Corporate tax rate (TAX) is also statistically significant at 10% in influencing NIM but not statistically significant in influencing RAROA and RAROE. This implies that higher corporate taxes reduces banks profitability. Interest rate is statistically significant in influencing RAROA and NIM. The only variables that are not statistically significant in determining banks' profitability in Africa are GDP growth rate and inflation rate.

TABLE 4
REGRESSION RESULTS

	(11) Dependent Variable: RAROA	**(12) Dependent Variable: RAROE**	**(13) Dependent Variable: NIM**
DR	-2.39e-11***	-2.88e-10****	-5.54e-11*
	(-2.71)	(-4.75)	(-1.89)
SIZE	-0.0157	-0.195**	-1.168**
	(-0.20)	(-2.10)	(-2.74)
TANASSETS	-6.126**	-4.329	-4.060
	(-2.39)	(-1.43)	(-1.14)
GROWTH	0.00268	0.0213*	0.0048
	(1.49)	(1.76)	(0.43)
LNTAX	-0.151	0.726	-0.726*
	(-0.46)	(0.63)	(-1.78)
INTERATE	0.0163***	-0.0125	-0.129***
	(3.32)	(-1.55)	(-3.00)
GDPGR	0.0268	-0.0106	-0.00332
	(1.44)	(-0.40)	(-0.18)
INFLRATE	0.00098	0.00255	0.0104
	(0.58)	(1.63)	(1.29)
C	1.234	-0.506	14.21***
	(0.90)	(-0.13)	(2.81)
N	1031	884	885
R-sq	0.067	0.012	0.550
Adj. R-sq	0.060	0.003	0.546

t statistics in parentheses
* p<0.10, ** p<0.05, *** p<0.01, **** p<0.001

SUMMARY, CONCLUSION AND POLICY IMPLICATIONS

This paper examines capital structure and bank profitability in Sub-Sahara Africa. The study uses eight variables as determinants of banks' profitability in Sub-Sahara Africa: debt ratio, size of a bank, asset tangibility, growth rate of banks, taxes, GDP growth rate, interest rates and inflation rate. Due to the problem of heteroskedasticity, autocorrelation and multicollinearity in the panels, the study employed robust standard errors to estimate the parameters.

The study uses the debt ratio as a proxy for capital structure. The main objective was to examine whether capital structure affects banks profitability in sub-Sahara Africa and also to examine nature of relationship between capital structure and bank profitability.

The findings suggest that, banks capital structure is an adverse driver of their profitability. This implies that banks in Sub-Sahara Africa will be best served by reducing their debt ratios and resorting to equity financing to enhance their profitability since higher debt ratios reduces their profitability. The fact that stock markets in Sub-Saharan Africa are underdeveloped mean that banks in Africa do not have to be concerned about the signaling hypothesis should they employ equity finance. The negative impact of banks' capital structure on their profitability may be a result of higher bankruptcy cost that outweighs the benefits of debt financing in a form of tax savings according to the trade-off theory of capital structure. Government and policymakers should reduce corporate tax rate since it reduces banks' profitability. When taxes are reduced and banks become more profitability, it provides them the enabling environment to create more jobs thereby reducing unemployment in Africa. Banks need to increase their interest rates a bit since it positively enhances their NIM.

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AUTHOR CONTACT

Ebenezer Bugri Anarfo
GIMPA Business School
P. O. Box AH 50
Achimota
Accra – Ghana
(+233) 26 716 0600