

The Impact of Capital Structure on Profitability of Banks in Malawi

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This study examines the impact of capital structure on bank profitability in Malawi. It examines the impact of debt equity ratio on profitability of banks. Using the Arellano and Bover General Method of Moments estimator, the study estimates a dynamic panel model. Evidence shows that debt has no impact on profitability measured by return on assets and has positive impacts on return on equity. Findings reject the existence of an optimal debt equity ratio in the Malawi banking sector. Banks should therefore focus on financing assets through debt than equity as it positively affects return on equity.

Keywords: capital structure, profitability, Modigliani and Miller, dynamic panel, Malawi

INTRODUCTION

In Malawi like in most countries, the banking sector is one of the largest of the financial sector and forms an integral part of the economy. According to Kaluwa and Chirwa (2017), the Malawi banking sector assets contributes 37% of the country's Gross Domestic Product (GDP) as such its performance has serious implications on the financial sector and the economy at large. To continue operating, banks have to be making profits and this is why the issue of profitability of banks has received a lot of research attention in recent years (Ayanda et al, 2013). Bank profitability in Malawi is among the highest in the world (Kaluwa & Chirwa, 2017). In 2006, the return on assets was 6.4% on average, 4.8% higher than the world average. Kaluwa and Chirwa (2017) attributed these high profits to high monopoly power and collusive pricing behaviour. Monopoly power and collusive behaviour led to high lending rates and the rates were almost the same from 2005 to 2011 for the two largest banks; National Bank of Malawi and Standard Bank.

In recent years, Malawi has seen an increased competition for deposits in the banking sector (RBM, 2016). This has resulted in rising of debt equity ratios for some banks yet there is little research on the impact of this rising debt on profitability. This study therefore carries out an empirical analysis of the relationship between capital structure¹ and bank profitability in Malawi. The study aims at examining the impact of debt-equity ratio on profitability of banks in Malawi. It tests the hypothesis that debt-equity ratio has no impact on profitability. This study theoretically adds to literature on whether capital structure

is a determinant of firm profitability in the Malawi's financial sector. It essentially informs literature on whether banks should finance their operations through debt or equity or through an optimal combination of both. Thus, the study contributes to the pool of knowledge in literature by establishing whether an optimal debt equity ratio that maximises profits exists in the banking sector in Malawi.

This paper is organized as follows: Section 2 discusses both the theoretical and empirical literature on capital structure and bank profitability. Section 3 provides an overview of the banking sector in Malawi which is followed by sections on econometric modelling and estimation technique, variable definition, measurement and expected impact, data and descriptive statistics. Section 7 presents and discusses the empirical results with the last section drawing conclusions from the findings.

LITERATURE REVIEW

The theory of Modigliani and Miller (MM proposition I) of 1958, forms the basis for both the theoretical and empirical debates on the relationship between capital structure and firm performance. The theory suggests that when there are no taxes and no bankruptcy costs, capital structure decision of the firm is irrelevant (Myers, 1984). Later in 1963, Modigliani and Miller modified proposition I, and came up with MM proposition II. MM proposition II recognizes the impact of tax shield on firm value. This is on the understanding that interest payment on debt is tax deductible (Myers, 1984). Thus the best capital structure of a firm should be the one with hundred percent of debt instruments (Lawal et al, 2014).

The unrealistic assumptions of Modigliani and Miller allowed the development of theories such as the static trade theory, the pecking order theory and the agency cost theory in an attempt to explain how capital structure affects firm profitability. The consideration of a tax system and bankruptcy costs in these theories suggest the existence of an optimal debt to equity ratio (Myers, 1984). The static trade off and agency cost theories suggest that increasing debt equity ratios and debt asset ratios have a non-linear effect on firm value and profitability. Debt financing increases profitability up to a certain level, from which further increase reduces the value of the firm.

The pecking order theory however, proposes that there is no well-defined target debt-equity mix because of the existence of internal and external equity with internal financing a priority in the pecking order (Myers, 1984). According to Myers, the pecking order theory is based on asymmetric information and proposes that firms prefer internal finance to external finance. This is so because funds from internal sources such as returned earnings are raised without sending any adverse signals that may lower the share price. In addition, if external finance is required, firms issue debt first, then hybrid securities and issue equity only as a last resort. An issue of debt is less likely to be interpreted by investors as a bad omen than the issue of equity. Therefore, firms issue debt rather than equity if internal finance is insufficient.

There is a great deal of empirical literature that examined the impact of capital structure on bank profitability. These studies have produced mixed results. Some studies have found a positive impact, while others have established either a negative effect or no effect. For instance, Ebaid (2009) found a negative significant relationship between short-term debt, total debt and Return on Assets (ROA). For Return on Equity (ROE), the study found that capital structure is irrelevant, agreeing with the findings of Modigliani and Miller proposition I. Anarfo and Appiahene (2017) used a dynamic panel regression robust analysis and data from 37 countries in Sub-Sahara Africa and found that debt ratio is negatively related to profitability measured by risk adjusted return on asset, risk adjusted return on equity and Net Interest Margin. This means that capital structure is an adverse driver of bank profitability in Sub-Sahara Africa. In agreement, the study by Siddik et al (2017) in Bangladeshi, indicated that capital structure variables captured by total debt to total asset ratio, long-term debt to total asset ratio and short-term debt to total asset ratio have significant negative impacts on return on assets, return on equity and earning per share.

Salim & Yadav (2012) using data from 1995-2011 of 237 Malaysian companies examined the relationship between capital structure and firm performance on firms listed on Malaysia Stock exchange. They observed a significant negative influence of total debt to total asset ratio, long-term debt to total asset ratio and short-term debt to total asset ratio on EPS, ROA, ROE and Tobin's Q. Sovbetov (2013),

Gropp & Heider (2009), Osborne et al (2011), Dogan (2013) also found that capital structure has a negative impact on bank profitability in United Kingdom, United States and Europe, United States and Turkey respectively.

In contrast to the findings of Anarfo and Appiahene (2017), Anafo et al (2015), investigated the relationship between capital structure and profitability of banks listed on the Ghana stock exchange and found that financial leverage measured by short-term debt to total assets had significant positive relationship with profitability. Long Term Debt to Total Asset also had a significant positive relationship with return on assets and return on equity. This is in agreement with the findings of Taani (2013) and Abor (2005) in Jordan and Ghana respectively.

In Malawi, the relationship between capital structure and firm profitability has received limited research attention and more specifically in the banking industry. Despite that increasing debt equity ratios have been accompanied by decreasing return on assets and return on equity in recent years, most studies on bank profitability have focused on the impact of financial regulation and other determinants with limited or no particular interest on capital structure. Such studies include Kaluwa and Chirwa (2017) on competition and banking industry regulation, Chimkono (2015) who evaluated the impact of non-performing loans on the financial performance of commercial banks in Malawi, Lipunga (2014) on determinants of commercial bank profitability, Mlachira and Chirwa (2004) on financial reforms and interest spreads in the commercial banking system and Chirwa (2003) who explored the relationship between market structure and profitability of commercial banks in Malawi.

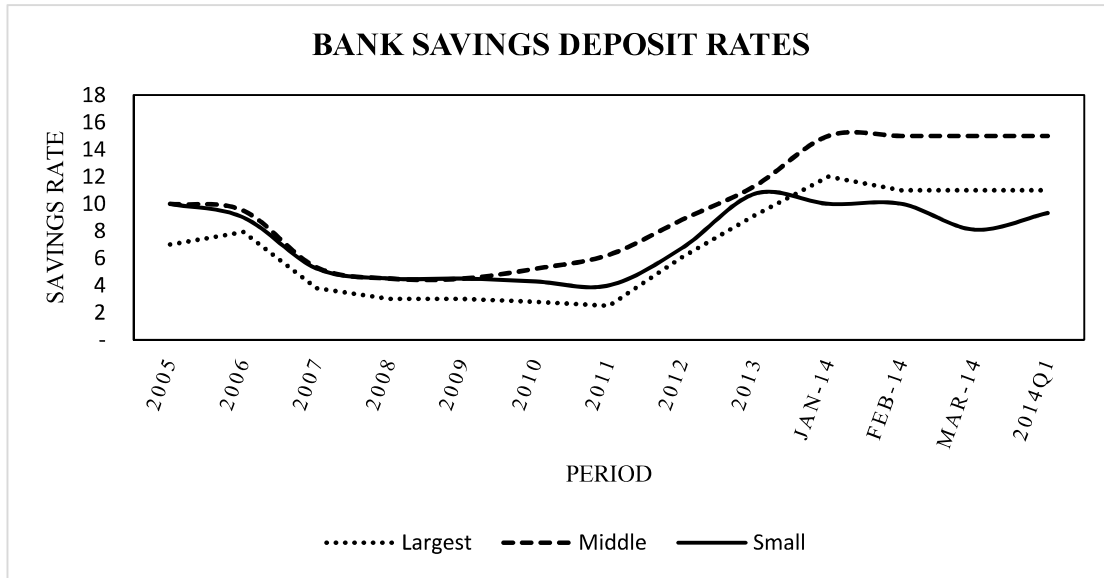
This research gap needs to be filled considering the fact that profitability is one of the major factors that ensure continuity of the banking sector. This study therefore comes in to fill this research gap. In addition, most studies from other countries did not capture the dynamic persistency of bank profits. They mainly used pooled ordinary least squares and fixed effects models. This has short falls as profit persistence as suggested by most literature is not captured. The existence of an optimal debt equity ratio as argued by the static trade off and the agency cost theories, has also not been tested in these studies. This study is therefore different from most of these studies as it uses a dynamic panel model that captures profit persistency and also tests the existence of an optimal debt equity ratio in Malawi.

AN OVERVIEW OF THE BANKING SECTOR IN MALAWI

The banking industry in Malawi is highly regulated by the Reserve Bank of Malawi (RBM). For instance, the RBM adopted the Basel II in 2012 and uses this to set minimum liquidity reserve ratio and the minimum capital ratio. By end 2015, there were 12 registered banks and one leasing finance company that operated in the banking market in Malawi (RBM, 2016). This number however dropped to 10 in 2016 following the acquisition of Malawi Savings Bank (MSB) by FDH bank and Inde bank by National Bank of Malawi. This was largely a result of failure by the two acquired banks to meet minimum capital regulatory requirements. The adoption of Basel II in January 2012 has created more competition on deposits among banks in Malawi over the years and this is evidenced by the decline in the Hirschman Herfindhal index (HHI) of concentration from 0.301 to 0.222 for deposits between 2001 and 2013 (Kaluwa & Chirwa, 2017). Over the years, the two largest banks have commanded a large market share in terms of deposits and loans. But the introduction of the Basel II has seen this share decline over the years.

By June 2016, the sector continued to be dominated by two banks whose total assets and deposits constituted 50.1 percent and 52.4 percent of the industry respectively (RBM, 2016). However, the position was slightly lower than the September 2015 position of 52.4 percent and 53.3 percent, respectively. In addition, bank deposit rates have shifted to higher rates suggesting competitiveness on deposits by banks. Figure 1 shows trends of savings deposit rate of large, middle and small banks in Malawi.

FIGURE 1
SAVINGS RATES: COMPETITIVE SMALLER BUT MIDDLE BANKS DOMINANCE

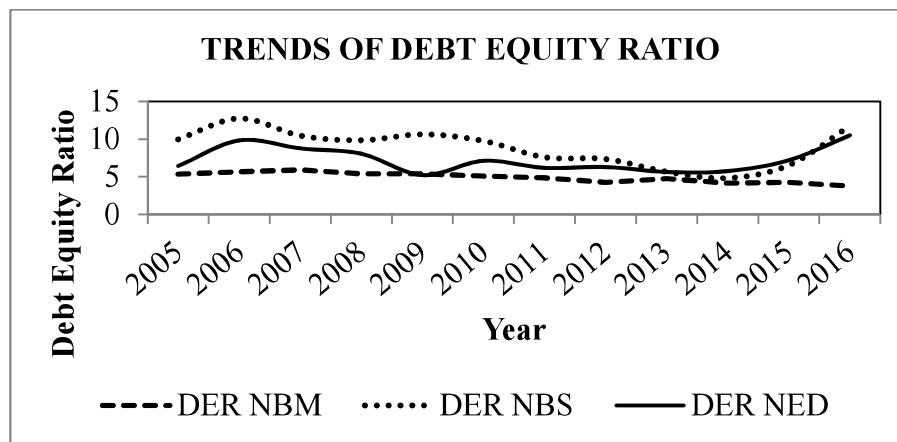


Source: Kaluwa and Chirwa, 2017.

Notes: Largest dominated by National Bank of Malawi (2005-January 2014), Middle by First Merchant Bank (throughout) and Small by Inde Bank (2008+). For largest banks, National Bank of Malawi and Standard Bank shares in deposit were 26% and 25% respectively in 2012 while for middle banks, NBS Bank and First Merchant Bank had 14% and 10% respectively. Ned Bank and Inde Bank are among the smallest, with 2% and 4% respectively.

The deposit rates are higher for middle and small banks on average as compared to large banks over the years 2005 to 2014. The figure also shows that the deposit rates have been increasing over the years. All this suggests that banks in Malawi are competing for deposits as a source of funds. The result of this has been the increase in debt equity ratios for some banks in recent years as presented by Figure 2.

FIGURE 2
TRENDS OF DEBT EQUITY RATIO FOR NBM, NBS AND NED BANK 2005 TO 2016



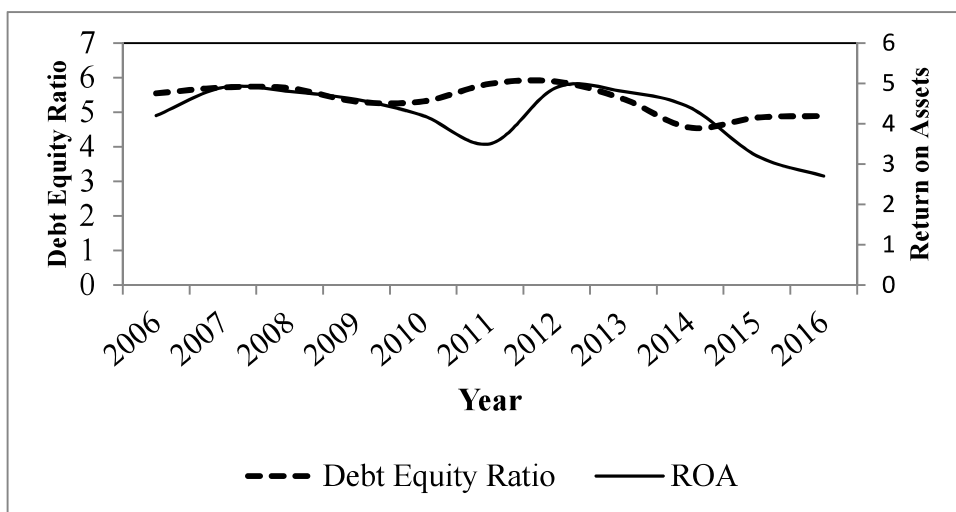
Source: Reserve Bank of Malawi.

Notes: DER=Debt Equity Ratio, NBM=National Bank of Malawi and NED=Ned Bank. DER increasing for NED and NBS from 2014 but fairly stable for NBM

The debt equity ratio for National Bank of Malawi has been fairly stable over the years. But for NBS and Ned bank, the ratio has on average been decreasing in the years 2006 to 2013. From 2014 to 2016, the debt equity ratio has been increasing. This implies that in recent years, these banks have been more into debt financing than equity. Bank debt in Malawi is mostly comprised of deposits. In 2016, the Reserve Bank of Malawi shows that deposits constituted 65.3 percent of the total funding (RBM, 2017). The overdependency on deposits to finance assets is explained by the lack of well developed capital markets. In 2016, the capital market was still characterised by few stock listings and low market activity (RBM, 2016).

In 2016, the banking industry remained profitable with aggregate profit after tax growing from MK33.4 billion in 2015 to MK36.8 billion in 2016 (RBM, 2017). That's a growth of 10.2 percent. Despite this increase in profit after tax, return on assets (ROA) and return on equity (ROE) marginally declined from 3.2 percent and 20.1 percent in 2015 to 2.7 percent and 18.4 percent in 2016, respectively. The Reserve Bank of Malawi attributed this decline to a lower growth in profit which grew by 10.2 percent relative to a higher growth in average total assets and average equity which grew by 30.6 percent and 9.3 percent respectively. It has been noted that bank capital structure in Malawi is leaned towards debt. Figures 3 and 4 present the trends of debt equity ratio, return on assets and return on equity. These figures show what has been happening to ROA and ROE as debt equity ratio was changing over the period 2006 to 2016.

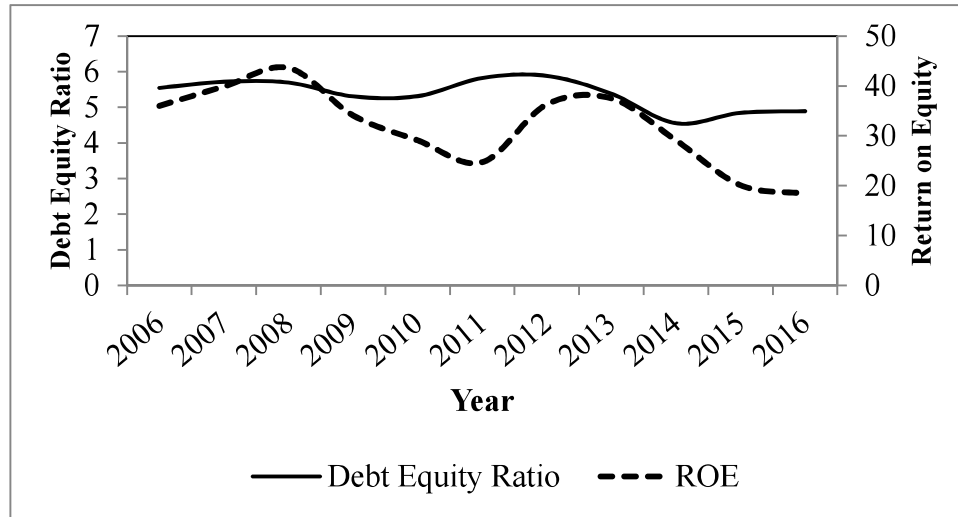
FIGURE 3
TRENDS OF DEBT EQUITY RATIO AND RETURN ON ASSETS



Source: Reserve Bank of Malawi.

Notes: ROA=Return on Assets. Positive relationship between debt equity ratio and ROA from 2006-2013. Negative relationship 2014 onwards.

FIGURE 4
TRENDS OF DEBT EQUITY RATIO AND RETURN ON ASSETS



Source: Reserve Bank of Malawi

Notes: ROE=Return on Equity. Positive relationship between debt equity ratio and ROE from 2006-2013. Negative relationship 2014 onwards.

The trends from these figures show that from 2006 to 2013 there has been a positive relationship between debt ratio and the two measures of profitability, return on assets and return on equity. From 2014 we note a negative relationship between debt equity ratio and profitability. Debt equity ratio has an upward trend while ROA and ROE has been decreasing. Further, we observe that profitability decline is more pronounced after the adoption of the Basel II accord in 2012. Perhaps this could be a result of competition on deposits which followed the adoption of the Basel II as suggested by (Kaluwa & Chirwa, 2017). This competition has contributed to the decline in the deposit debt ratio in recent years. Deposits are a cheaper source of funding as they are tax deductible and are paid low interest rate compared to other forms of debt.

ECONOMETRIC MODELLING AND ESTIMATION TECHNIQUE

The study uses the structure conduct performance model and adopts the specification used by Athanoglou et al (2005) and Flamini et al (2009). The general model is given as follows:

$$\pi_{it} = \alpha + \sum_{k=1}^K \beta_k X_{it}^k + v_{it} \quad (1)$$

where:

π_{it} is the profitability of bank i at time t , with $i=1, \dots, N$; $t=1, \dots, T$, α is a constant term, X_{it}^k are k explanatory variables and v_{it} is the disturbance with ε_i the unobserved bank-specific effect and μ_{it} the idiosyncratic error. This is a one-way error component regression model, where $\varepsilon_i \sim \text{IIN}(0, \sigma_\varepsilon^2)$ and independent of $\mu_{it} \sim \text{IIN}(0, \sigma_\mu^2)$.

The explanatory variables are then grouped into bank specific, industry specific and macroeconomic factors. The general model then becomes:

$$\pi_{it} = \alpha + \sum_{j=1}^J \beta_j X_{it}^j + \sum_{n=1}^N \beta_n X_t^n + \sum_{m=1}^M \beta_m X_t^m + v_{it} \quad (2)$$

where X_{it}^j denotes bank-specific determinants and X_t^j with superscripts n and m denote industry-specific and macro-economic determinants respectively.

Dynamic panel is based on generalized method of moments (GMM), which was developed by Hasen (1982). Since the focus of this study is on capital structure, we separate the capital structure variables from other bank specific factors. The general model augmented with lagged profitability is given as follows:

$$\pi_{it} = \alpha + \delta\pi_{i,t-1} + \sum_{j=1}^J \beta_j X_{it}^j + \sum_{i=1}^N \beta_n X_{it}^n + \sum_{i=1}^M \beta_m X_t^m + \sum \beta_k X_t^k + v_{it} \quad (3)$$

where:

π_{it} is bank profitability, $\pi_{i,t-1}$ is a one period lagged bank profitability, X_{it}^j is vector of capital structure variables, X_{it}^n is a vector of other bank specific variables, X_t^m is a vector of industry specific variables, X_t^k is a vector of economy wide or macroeconomic variables and v_{it} is a disturbance or error term. δ captures the speed of adjustment to equilibrium. A value of δ between 0 and 1 signals profit persistency but after time profits will eventually return to normal (average) level (Athanasoglou et al, 2005). The industry is fairly competitive (high speed of adjustment) if the value of δ is close to 0 while a value of δ close to 1 means the industry is less competitive (very slow adjustment). From the general model, the study estimates Equations 4 and 5 presented below:

$$ROA = \alpha_0 + \delta ROA_{i,t-1} + \beta_1 DER_{it} + \beta_2 SQDER_{it} + \alpha_1 \ln Assets_{it} + \alpha_2 LOD_{it} + \alpha_3 NPL_{it} + \alpha_4 OEOI_{it} + \lambda_1 HHI_t + \lambda_2 LRR_t + \varphi_1 ChangeRGDP_t + \varphi_2 INF_t + \varphi_3 TFR_t + v_{it} \quad (4)$$

$$ROE = \alpha_0 + \delta ROE_{i,t-1} + \beta_1 DER_{it} + \beta_2 SQDER_{it} + \alpha_1 \ln Assets_{it} + \alpha_2 LOD_{it} + \alpha_3 NPL_{it} + \alpha_4 OEOI_{it} + \lambda_1 HHI_t + \lambda_2 LRR_t + \varphi_1 ChangeRGDP_t + \varphi_2 INF_t + \varphi_3 TFR_t + v_{it} \quad (5)$$

where ROA is return on assets and ROE is return on equity as proxies for profitability. ROA is measured as a ratio of net income to total assets while ROE is measured as a ratio of net income to total equity, DER is debt equity ratio and SQDER is the square of debt to equity ratio to capture nonlinear effects of debt. $\ln ASSET$ is the natural logarithm of total assets capturing bank size. LOD represents the loan to deposit ratio as a measure of liquidity and NPL is non-performing loans to total loans ratio measuring asset quality. OEOI stands for operating expenses to operating income ratio capturing management efficiency, HHI is the Hirschman Herfindhal Index of concentration, LRR is the liquidity reserve ratio, ChangeRGDP is the percentage change in real GDP capturing economic growth, INF is inflation and TFR is total foreign reserves. The choice of these variables is mainly based on previous literature and theory.

In econometrics literature, dynamic panels are often faced with the problem of endogeneity because of the introduction of a lagged value of the dependent variable as a regressor (Baltagi, 2009). With endogeneity, standard panel data estimators such as fixed effect and random effect estimators are biased and inconsistent. To deal with endogeneity, Baltagi suggests the use of an Arellano and Bover estimator. It is a System GMM estimator which was proposed by Arellano and Bover (1995) to control potential endogenous explanatory variables in panel data (Ayaydin & Karakaya, 2014). It estimates a level-equation and a difference equation. The first difference model is used by this method to eliminate the time-invariant firm-specific effect (Mueller, 1977). According to Mueller, lags of original level endogenous variables generated instrumental variables. This study therefore uses the Arellano and Bover system GMM estimator that controls for endogeneity and firm specific effects. Even when the sample period is short the estimator produces unbiased and consistent estimates.

VARIABLE DEFINITION, MEASUREMENT AND EXPECTED IMPACT

Dependent Variable

The dependent variable is bank profitability measured by a number of variables including return on assets (ROA), return on equity (ROE), net interest margin (NIM) and earnings per share (EPS). This study uses the most common accounting based measures used in literature; return on assets (ROA) and return on equity (ROE). The two captures how much profit a firm has earned on invested assets and how effectively managers use investors' funds (Vatavu, 2015). Kalluci (2011) argues that the two are also indicators of management efficiency towards generating income from funds. On one hand, return on assets measures the ability of bank management to generate income by utilising available company assets and is generally expressed as a ratio of net profits after taxes to total assets (Ongore & Kusa, 2013).

$$ROA = \frac{Net_Profits}{Total_Assets} \quad (6)$$

On the other hand return on equity (ROE) captures profits earned by a firm in comparison to the shareholder equity. It is the ratio of net income to shareholders' equity. For banks, it is captured as a ratio of net profits after taxes to total assets (Kumbirai & Webb, 2010).

$$ROE = \frac{Net_Profits}{Total_Equity} \quad (7)$$

Independent Variables

Employing the structure conduct performance model, the study uses bank specific, industry specific and macro-economic variables as independent variables. Since the main objective of this study is to examine the impact of capital structure on bank profitability, capital structure variables makes the main bank specific variables of the study. Following Opuku et al (2013), this study uses debt equity ratio (DER) to proxy capital structure. This is consistent with the definition of capital structure by theories of Modigliani and Miller, the static trade off theory and the agency cost theory. To capture the nonlinear effects of debt as suggested by the static trade off and agency cost theories, this study include the square of debt to equity ratio (SQDER). This will help to test if an optimal capital structure exists as proposed by the two theories.

Based on theory and previous literature on determinants of bank profitability the study employs bank size, liquidity, asset quality and expenses management as other bank specific variables. Bank size is used to capture economies of scale that arise as the bank grows is measured by the natural logarithm of total assets of banks and is expected to have a positive impact on profitability (Gul et al, 2011). Liquidity is used to capture the capacity of a bank to pay off the debt obligations that are short-term and is measured by proportion of the current assets to the current liabilities of a bank (Atellu, 2004, Makri 2014). Current assets of banks are in form of loans and current liabilities are in form of deposits. Literature suggests that there is a nexus between profitability and liquidity. On one hand it can help boost bank profits while on the other hand, an increase in the loan to deposit ratio may negatively affect profitability.

Asset quality which is used to capture bank's credit risk is measured by the ratio of non-performing loan to total loans. We expect an inverse relationship between bank profitability and non-performing loan to total loan ratio since an increase in non-performing loans implies that the firm is exposed to high credit risk, which negatively affects profits (Olweny & Shiphoo, 2011). Expenses management used to capture management efficiency is expressed as ratio of operating expenses to operating income (Kosmidou, 2008). Athanasoglou et al (2005) argue that this ratio is expected to negatively affect profitability since improved management of these expenses will increase efficiency and raise profits.

Under industry specific variables, the study employs the Hirschman Herfindhal Index of concentration (HHI) and the liquidity reserve ratio (LRR). HHI ranges between 0 and 1 and is calculated by squaring the market share of each firm competing in the market and then summing the resulting numbers (Ana et al, 2011). The greater the HHI, the more concentrated the market. We expect HHI to

have a positive effect on profitability because in more concentrated markets, banks are able to adjust spreads in response to unfavourable changes in the macroeconomic environment leaving returns unaffected (Flamini et al, 2009). The liquidity reserve ratio is used as a regulatory instrument by the central banks (Kaluwa & Chirwa, 2017). Usuagwu, (2014) argue that the LRR is seen as a tax to bank since it limits the banks capacity to extend loans. Therefore it is expected to be negatively related to profitability.

The study includes economic growth, inflation and foreign reserves as macroeconomic variables. Economic growth is measured by the percentage change in real GDP and is expected to have a positive impacts on bank profits as it increases customer deposits and loans granted which leads to increase in profitability (Petriaa et al, 2015). Inflation affects bank profitability either positively or negatively depending on whether it is anticipated or not (Athanasoglou et al, 2005). Higher anticipated inflation rates allow banks to increase interest rates on loans, which increases bank profitability. If inflation is not anticipated, banks slowly adjust interest rate, which increases financing costs and negatively affecting profitability (Petriaa et al, 2015). Total foreign reserves have been included because Malawi banks earn approximately over 25% of their revenue from foreign exchange transactions and play a bigger role in the growth and stability of Malawi economy which is predominantly an importing nation. They influence the overall exchange rate movement. Since banks generate income from foreign exchange transactions, we expect a positive relationship between total foreign reserves and bank profitability.

DATA AND DESCRIPTIVE STATISTICS

This study uses yearly secondary data corrected from financial statements and balance sheets of banks in Malawi. Data for industry specific variable was sourced from the Reserve Bank of Malawi while economy wide variables came from the World Development Indicators (WDI). A panel of six banks is formed covering the period from 2005 to 2016. This sample size has been selected mainly due to data availability and we adopted the selection criteria of Kaluwa and Chirwa (2017) of two largest banks, two middle banks and two smallest banks in terms of bank deposits. The six banks making the sample of the study are National bank of Malawi (NBM), Standard bank (STD), NBS bank, First Merchant bank (FMB) Inde bank and Ned bank. Table 1 below presents the descriptive statistics of the variables used in this study.

TABLE 1
DESCRIPTIVE STATISTICS

Variable	Observations	Mean	Std Deviation	Minimum	Maximum
ROA	70	0.0334	0.0276	-0.0500	0.1000
ROE	70	0.2053	0.1890	-0.6361	0.5269
DER	70	6.1057	2.1487	3.3475	12.7428
LOD	70	0.6224	0.2067	0.2508	1.2002
NPL	68	0.0914	0.1841	0.0003	0.9274
OEOI	69	0.6489	0.2064	0.3269	1.2843
HHI	66	0.2307	0.0325	0.1700	0.2972
LRR	72	13.4250	5.3070	7.5000	18.6000
ChangGDP	72	5.2779	2.3672	1.8858	9.6000
Inflation	72	15.3101	7.0265	7.4116	27.2833
TFR	72	0.3385	0.1866	0.1419	0.6787

Notes: ROA= Return on Assets, ROE=Return on Equity, DER=Debt Equity Ratio, LOD=Loan Deposit ratio, NPL=Non-performing Loans, OEOI=Operating Expenses to Operating Income, HHI= Hirschman Herfindhal Index of concentration, LRR=Liquidity Reserve Ratio, ChangGDP= Percentage Change in Real GDP and TFR= Total Foreign Reserves.

The table shows that over the years, the mean of return on assets and return on equity are 3.3% and 20.5% respectively. This means that on average, banks in Malawi have earned profitability of 3% in terms of ROA and 20.5% in terms of ROE. The highest ROA over the period is 10% while the lowest is -5% which means that some banks have been experiencing losses over the period. Equity holders have also been experiencing losses evidenced by the minimum ROE of -63.6%. The highest ROE is 52.7%. In terms of capital structure, the average debt equity ratio is 6.1 with the minimum values at 3.4. This means that for the sample banks, debt has dominated equity over the years. Debt finances nearly 81% of bank assets.

The mean for the loan deposit ratio is 0.622 which means the on average banks over the period converted 62.2% of deposits into loans. With the average required liquidity reserve ratio at 13.4 percent, it implies that banks in Malawi hold excess liquidity. They hold reserve 24.4% above the required amount on average. However, the maximum loan deposit ratio is 1.2 meaning that sometimes banks issue loans more than deposits. This tells that banks do not depend only on deposits to fund their assets. The other funding comes from other forms of debt or equity. On average, out of the loans extended 9.1% become impaired or non-performing.

EMPIRICAL RESULTS AND DISCUSSION

Prior to estimation of Arellano and Bover models, this study carried out two diagnostic tests as suggested by Curak et al (2012) to ensure validity of the results. These are the Sargan test for over identification restrictions and the abond test for second order serial correlation. The results of these tests showed that the over identification restrictions are valid and there is no second order autocorrelation in all the two models (see appendix A and B). Pairwise correlation matrix also showed that there is no multicollinearity since they are all less than 0.7 (see appendix C). The results of the two tests allows us to proceed to interpretation and discussion of the Arellano and Bover estimation results. We present results for two regression models; one model with return on assets (ROA) as the dependent variable and another with return on equity (ROE) as the dependent variable.

The Arellano and Bover estimation results of the two models are presented in Table 2 below. ROA has been used as a general measure of profitability, which captures the ability of bank management to generate profits by using the available financial and real assets (Obamuyi, 2013). ROE has been used to measures profits earned by a bank in comparison to the shareholder equity invested. Return on equity is one of the main indicators of management efficiency towards generating income from funds. It has been used in this study to examine how capital structure decisions affect profits earned by bank shareholders.

The results from Table 2 indicate that the coefficient on the one year lagged values of ROA is positive and significant at 1% significance level while that of ROE is positive but insignificant. For ROA the value of the coefficient is 0.273 which is between 0 and 1. This means that profitability in terms of ROA in the banking sector in Malawi is persistent. A value between 0 and 1 implies that profits are persistent, but will eventually return to normal (average) level. The previous year's return on assets positively influences the current year's ROA. The results for return on equity implies the ROE is not persistent. Thus, the previous year's return on equity does not affect the current year's ROE.

It is further noted from the results that capital structure, the focus of this study, has different impacts on return on assets and return on equity. It is a significant determinant of on return on equity but not return on assets. Debt equity ratio which is our measure of capital structure, has a positive impact on return on equity and it is significant at 1% significance level. Thus, increasing debt relative to equity, increases ROE. We find that a one point increase in the debt equity ratio, on average leads to 0.0399 points increase in ROE, *ceteris paribus*.

TABLE 2
ARELLANO AND BOVER ESTIMATION RESULTS

Variable	Return on Assets	Standard Error	Return on Equity	Standard Error
Lagged profitability	0.2143***	(0.0824)	0.0921	(0.1467)
Debt equity ratio	-0.0041	(0.0028)	0.0399***	(0.0117)
Squared debt to equity ratio	0.0003*	(0.0002)	-0.0004	(0.0008)
Bank size	-0.0015	(0.0038)	0.0128	(0.0245)
NPL to gross loans ratio	-0.0187**	(0.0074)	-0.1445***	(0.0496)
Loan to deposit ratio	-0.0104	(0.0081)	-0.0897	(0.0645)
Operating expenses to assets ratio	-0.1108***	(0.0222)	-0.8194***	(0.1650)
Hirschman Herfindhal Index	0.0412	(0.0265)	0.1979	(0.1323)
Liquidity reserve ratio	-0.0002	(0.0003)	-0.0017	(0.0026)
Economic growth	0.0008	(0.0007)	0.0092	(0.0064)
Inflation	0.0008***	(0.0003)	0.0033*	(0.0018)
Total Foreign Reserves	-0.0230*	(0.0125)	-0.1269	(0.1079)
Cons	0.1196***	(0.0403)	0.3547	(0.2707)
<i>N</i>	57		57	

Notes: Standard errors in parentheses; **Levels of significance:** * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$
NPL=Non-performing Loans.

On the square of debt equity ratio, the results show that it is only significant for ROA and has a positive coefficient. For return on equity, the coefficient of the square of debt equity ratio is insignificant refuting the existence of a non-linear relationship between debt and return on equity. These results therefore do not support the existence of an optimal debt equity ratio as advanced by the static trade off and agency cost theories. This is in agreement with Modigliani and Miller proposition II, which argues that the best capital structure is one with 100 percent debt. It is also in line with the findings of Anafo, Amponteng, & Yin (2015) and Taani (2013) who found a significant positive impact of debt on bank profitability in Ghana and Jordan. The similarity between Malawi and these countries may be due to the fact that these countries are developing as such their capital markets are not well developed. For instance, bond markets are almost non-existent (Lesle, 2012).

However, these results are in contrast to the findings of most studies in Europe, Asia and some African countries. Sovbetov (2013), found a negative relationship between debt equity ratio, total debt to total asset ratio and both return on assets and return on equity in the United Kingdom banking system. Siddik et al (2017), Gropp & Heider (2009), Osborne, Fuertes & Milne (2011) and Dogan (2013) also found that capital structure has a negative impact on bank profitability in Bangladeshi, United States and Europe, United States and Turkey respectively. In Africa, Anarfo and Appiahene (2017), found a negative relationship between debt and profitability in Sub-Sahara Africa.

The difference on the effects of debt on bank profitability between Malawi and European countries can be attributed to the difference in the composition of bank debt in these countries. Bank debt in Malawi is largely composed of bank deposits. Deposit financing, as retail funding, is more stable than wholesale funding (Lesle, 2012). According to Lesle (2012), in developing countries like Malawi, retail funding dominates and loans are primarily financed by deposits, reflecting low levels of private sector debt and high savings ratios. European banks on the other hand, have the highest level of reliance on wholesale funding, averaging 61 percent of total liabilities, twice that of emerging economies (37 percent). In addition, core funding ratios are lower in Europe than in developing countries (Lesle, 2012). According to Lesle (2012), deposits finance 36 percent assets in Europe which is a smaller proportion compared to more than 80 percent in Malawi and 62 percent for North America and Asia. This is due to the fact that the customer funding gap is high in Europe than in Malawi. This is the amount by which

customer loans exceed customer deposits. Capital markets are also more developed in Europe than in Malawi and other in developing countries (Lesle, 2012).

For the other bank specific factors, only asset quality and expense management significantly influence bank profitability. Both the ratio of non-performing loans to gross loans (NPL) and the ratio of operating expenses to operating income (OEOI) have a negative impact on both return on assets and return on equity. This conforms to *a priori* expectations. The negative impact of non-performing loans on ROA is also consistent with the finding of Chimkono, (2015) who found a negative relationship between non-performing loans and return on assets in Malawi commercial banks. Bank size and the loan to deposit ratio capturing liquidity, have been found to be insignificant on both measures of profitability. However, Lipunga (2014) who found a positive relationship between bank size and profitability.

In terms of industry specific variables, both the liquidity reserve ratio and the Hirschman Herfindhal Index of concentration have insignificant impacts on both ROA and ROE. It is not surprising that the liquidity reserve ratio (LRR) is insignificant because as discussed in Section 5.2, banks in Malawi hold excess reserves as such hanging the LRR does not affect profits. They hold reserves 24.4% higher than the required reserve ratio. This is in agreement with Ngwira (2014) who argues that the reserve bank of Malawi rarely changes the liquidity reserve ratio and is not used as monetary policy because banks already hold reserves above the required minimum.

For macroeconomic variables, inflation has a positive significant impact on both return on assets and return on equity. A one percent increase in inflation increases ROA and ROE by 0.001 and 0.003 points respectively. This is consistent with our *a priori* expectations. In Malawi, inflation has been one of the highest in the SADC region over the years (RBM, 2013). This has allowed banks to factor inflation into interest rates charged on loans hence the positive significant impact on profitability. Higher anticipated inflation rates allow banks to increase interest rates on loans to raise revenue, which increases bank profitability (Athanasoglou et al, 2005). Total foreign reserves only influence return on assets. It has a negative effect on ROA and is significant at 1% significance level. This is a surprising result because we expected total foreign reserves to positively influence profitability. Another macroeconomic factor, economic growth measured by percentage change in real GDP has an insignificant impact on profitability in Malawi. Despite that we postulated a positive relationship between bank profitability and economic growth, Malawi has been experiencing little economic growth over the year and this is possibly the reason for the insignificant impact.

CONCLUSION

After examining the impacts of debt equity ratio on bank profitability in Malawi, the study finds that debt equity has no impact on profitability measured by return on assets (ROA) but has a positive impact on return on equity (ROE). This means that bank debt in Malawi does not significantly affect ROA but positively effects ROE. The square of debt equity ratio is only significant on ROA with a positive impact. The findings on ROA supports the capital structure irrelevance theory advance by Modigliani and Miller proposition I. On ROE, the results are in agreement with the argument raised by the Modigliani and Miller proposition II that the best capital structure is the one with 100% debt. Increasing debt, increases bank profitability and is consistent with the findings of Anafot et al (2015) and Taani (2013) in Ghana and Jordan respectively. However, the results are against the proposition of the existence of an optimal debt equity ratio made by the static trade off and agency cost theories. They also do not agree with most findings from Europe, Asia and America. We conclude that in Malawian banking sector, the existence of an optimal debt equity ratio that maximises profits and firm value is not supported. Banks should focus on financing assets through debt rather than equity as it has a positive impact on return on equity.

ENDNOTE

1. Capital structure is the way a firm finances its assets across a blend of debt, equity and hybrid securities (Saad, 2010). It is the mixture of debt and equity that make up the total capital of a firm. While most of the debt from non-banking firms is raised through bonds, bank debt includes deposits and funds raised through borrowing from other banks and the central bank (Diamond & Dybvig, 1986).

REFERENCES

- Abor, J. (2005). The effect of capital structure on profitability: An empirical analysis of listed firms in Ghana. *The Journal of Risk Finance*, 6, 438-445.
- Allerano, M., & Bover, O. (1995). Another Look at the Instrumental Variable Estimation of the Error Component Model. *Journal of Econometrics*.
- Ana, K., Blanka, S. & Roberto, E. (2011). Determinants of Bank Profitability in Croatia. *Croatian Operational Research Review*, 2.
- Anarfo, E.B., & Appiahene, E. (2017). The Impact of Capital Structure on Banks' Profitability in Africa. *Journal of Accounting and Finance*, 17(3).
- Anafo, S.A., Amponteng, E., & Yin, L. (2015). The Impact of Capital Structure on Profitability of Banks Listed on the Ghana Stock Exchange. *Research Journal of Finance and Accounting*, 6(16), 26-34.
- Atellu, R.A. (2004). *Determinants of Non-interest income in Kenyas Commercial Banks*.
- Athanasoglou, P., Brissimis, S., & Delis, M. (2005). *Bank Specific, Industry Specific and Macroeconomic Determinants of Bank Profitability*. Bank of Greece Working Paper, 06-47.
- Ayanda, M.A., Christopher, L.E., & Mudashiru, M.A. (2013). Determinants of Banks' Profitability in Developing Economy: Evidence from Nigerian Banking Industry. *Interdisciplinary Journal of Contemporary Research Business*, 4(9), 155-181.
- Ayaydin, H., & Karakaya, A. (2014, January). The Effect of Bank Capital on Profitability and Risk in Turkish Banking. *International Journal of Business and Social Science*, 5(1), 252-271.
- Baltagi, B.H. (2009). *A Companion to econometric analysis of Panel data*. New York: John Wiley and Sons.
- Chimkono, E. (2015). *Effect of Non-Performing Loans and other Factors on Performance of Commercial Banks in Malawi*. PHD thesis.
- Chirwa, E. (2003). *Determinants of Bank's Profitability in Malawi-Cointegration Approach*. Applied Financial Economics, Taylor and Francis.
- Curak, M., Poposkib, K., & Pepura, S. (2012). Profitability Determinants of the Macedonian Banking Sector in Changing Environment. *Procedia: Social and Behavioral Sciences*, 44, 406-416.
- Diamond, D.W., & Dybvig, P.H. (1986, January). Banking Theory, Deposit Insurance, and Bank Regulation. *The Journal of Business*, 59(1), 55-68.
- Dogan, M. (2013). Does Firm Size Affect The Firm Profitability? Evidence from. *Research Journal of Finance and Accounting*, 4(4), 53-59.
- Ebaid, E-S.I. (2009). The impact of capital structure choice on firm performance: Empirical evidence from Egypt. *The Journal of Risk Finance*, 10, 477-487.
- Flamini, V., McDonald, C., & Schumacher, L. (2009). *The Determinants of Commercial Bank Profitability in Sub-Saharan Africa*. IMF.
- Gropp, R., & Heider, F. (2009, September). *The Determinants of Bank Capital Structure*. Working Paper Series, (1096).
- Gropp, R., & Heider, F. (2009, September). *The Determinants of Bank Capital Structure*. Working Paper Series. Eurosystem: European Central Bank.
- Gul, S., Irshad, F., & Zaman, K. (2011). Factors Affecting Bank Profitability in Pakistan. *The Romanian Economic Journal*, 14(39), 61-87.

- Hansen, L.P. (1982). Large Sample Properties of Generalized Method of Moments Estimators. *Econometrica*, 50, 1029-1054.
- Kalluci, I. (2011). Analysis of the Albanian banking system in a risk-performance framework. *Proceeding of 3rd. Annual South-Eastern European Economic Research Workshop*. Athens: Bank of Greece & Bank.
- Kaluwa, B., & Chirwa, G.C. (2017). Competition, regulation and banking industry pricing conduct in Malawi. *African Review of Economics and Finance*, 9(2).
- Kosmidou, K. (2008). The determinants of Banks' Profits in Greece during the period of EU financial integration. *Managerial Finance*, 34, 146-159.
- Kumbirai, M., & Webb, R. (2010). A financial Ratio Analysis of Commercial Bank Performance in South Africa. *African Review of Economics and Finance*, 2, 30-53.
- Lawal, A.B., Terer, E.K., Kiyanjui, M.W., & Kayode, A.M. (2014). Effects of capital structure on firm's performance: Empirical study of manufacturing companies in Nigeria. *Journal of Finance and Investment Analysis*, 3, 39-57.
- Lesle, V. (2012). *Bank Debt in Europe: "Are Funding Models Broken?"*. IMF Working Paper. International Monetary Fund.
- Lipunga, A.M. (2014). Determinants of Profitability of Listed Commercial Banks in Developing Countries: Evidence from Malawi. *Research Journal of Finance and Accounting*, 5(6), 41-49.
- Makri, V.T. (2014). Determinants of Nonperforming Loans: The Case of Eurozone. *Panoeconomicus*, 2, 193-206.
- Mlachila, M., & Chirwa, E.W. (2004). *Financial Reforms and Interest Rate Spreads in the Commercial Banking System in Malawi*. IMF. IMF Staff Paper.
- Modigliani, F., & Miller, M. (1958, June). The Cost of Capital, Corporation Finance and the Theory of Investment. *American Economic Review*, 53, 261-297.
- Mueller, D.C. (1977). The Persistence of Profits above the Normal. *Economica*, 44(176), 369-380.
- Myers, S.C. (1984). The Capital Structure Puzzle. *The Journal of Finance*, 39(3), 575-592.
- Ngwira, N. (2014). *Implementing Monetary Policy in Malawi*. Monetary and Exchange Rate Policy. Nkopola, Mangochi, Malawi.
- Obamuyi, M.T. (2013). Determinants of banks' profitability in a developing economy: Evidence from Nigeria. *Organizations and Markets in Emerging Economies*, 4, 97-111.
- Olweny, T., & Shipho, T.M. (2011). Effects of Banking Sectoral Factors on the Profitability of Commercial Banks in Kenya. *Economics and Finance Review*, 1(5), 01-30.
- Ongore, O.V., & Kusa, B.G. (2013). Determinants of Financial Performance of Commercial Banks in Kenya. *International Journal of Economics and Financial Issues*, 3, 237-252.
- Opoku, E.F., Adu, J.K., & Anarfi, B.O. (2013). The Impact of Capital Structure and Profitability of Listed Banks on the Ghana Stock Exchange. *Social and Basic Sciences Research Review*, 1(2), 74-91.
- Osborne, M., Fuertes, A., & Milne, A. (2011). *Capital and Profitability in banking: Evidence from US banks*. London: UK Financial Services Authority.
- Petriaa, N., Caprarub, B., & Ihnatovc, I. (2015). Determinants of banks' profitability: Evidence from EU 27 banking systems. *Procedia Economics and Finance*, 20, 518-524.
- RBM. (2016). *Financial Institutions Supervision Annual Report*. Lilongwe: Reserve Bank of Malawi.
- RBM. (2016). *Financial Stability Report June 2016*. Lilongwe: Reserve Bank of Malawi.
- RBM. (2017). *Financial Institutions Supervision Annual Report*. Lilongwe: Reserve Bank of Malawi.
- Saad, M.N. (2010). Corporate Governance Compliance and the Effects to Capital Structure. *International Journal of Economics and Financial*, 2(1), 105-114.
- Salim, M., & Yadav, R. (2012). Capital structure and firm performance: Evidence from Malaysian listed companies. *Procedia - Social and Behavioral Sciences*, 65, 156-166.
- Siddik, M., Kabiraj, S., & Joghee, S. (2017, May 3). Impacts of Capital Structure on Performance of Banks in a Developing Economy: Evidence from Bangladesh. In N. Apergis (Ed.), *International Journal of Financial Studies* [4(13)].

- Sovbetov, Y. (2013, May). *Master in Business Administration. Relationship Between Capital Structure and Profitability: Evidence from UK Banking Industry Over the Period of 2007-2012*. Cardiff Metropolitan University.
- Taani, K. (2013). Capital structure effects on banking performance: A case study of Jordan. *International Journal of Economics, Finance and Management Sciences*, 1(5), 227-233.
- Usuagwu, E.S. (2014). Determinants of Bank Profitability in Nigeria. *International Journal of Economics and Finance*, 6(12), 46-63
- Vatavu, S. (2015). The impact of capital structure on financial performance in Romanian listed companies. *Procedia Economics and Finance*, 32, 1314-1322.

APPENDICES

APPENDIX A SARGAN TEST RESULTS

Null hypothesis: Over identifying restrictions are valid

Model	Chi-square statistic	Probability	Decision
Model 1	50.95392	0.2510	Fail to reject null hypothesis
Model 2	42.73759	0.5683	Fail to reject null hypothesis

Notes: Model 1 has return on assets as the dependent variable and return on equity is the dependent variable for model 2. The results show that over identifying restrictions are valid implying that the used instruments are adequate and the results are valid.

APPENDIX B ABOND TEST RESULTS

Null hypothesis: No autocorrelation

Model	Z-Statistic	Probability	Decision
Model 1	-1.2901	0.1970	Fail to reject null hypothesis
Model 2	-.54686	0.5845	Fail to reject null hypothesis

Notes: The results show that there is no second order autocorrelation in all the two models. A model with no second-order autocorrelation is a suitable model (Tatoglu, 2012).

APPENDIX C PAIRWISE CORRELATION MATRIX

Pwcorr	DER	InAssets	LOD	NPL	OEOI	HHI	LRR	RGDP	INF	TFR
DER	1									
InAssets	-0.3249	1								
LOD	0.4167	-0.017	1							
NPL	0.1518	0.2216	0.1241	1						
OEOI	0.5534	-0.5689	0.0157	0.1086	1					
HHI	0.1126	-0.1847	0.1377	-0.2267	0.0392	1				
LRR	-0.2077	0.2179	0.1529	-0.0566	-0.2082	0.3077	1			
RGDP	0.056	-0.2731	0.1095	-0.2109	-0.1459	0.2003	0.1573	1		
INF	-0.1855	0.3929	-0.164	0.3295	0.0111	-0.4852	0.0322	-0.6302	1	
TFR	-0.1717	0.594	-0.169	0.4344	-0.0065	-0.4124	-0.0637	-0.357	0.6573	1

Notes: The matrix shows that there is no multicollinearity since all the pairwise correlations are less than 0.7.