Impact of Capital Structure on the Portfolio Behaviour of Commercial Banks in Tanzania

Tobias A. Swai[†]

Abstract

This study examined the impact of bank capital structure measured by leverage ratio as defined in Based III based on tier 1 capital to total assets, on the portfolio behaviour of commercial banks in Tanzania by using fixed balance panel of annual financial statements data of 20 banks from 2002 to 2017. The studied banks had more than 89 percent of the total commercial banks' assets in 2017 and 79 percent of total loans. Consideration of portfolio behaviour was explained based on choice assets (loans, investment in government securities and interbank loans) and non-choice items (non-earning assets including cash, required reserved and investment in fixed assets). The study examined the impact of capital structure on the bank portfolio holding with respect to the size of the bank and ownership. Findings revealed that only 35% of the banks are undercapitalized as at the end of 2017. The variables tested were significant at $p < 0.01$ and $p < 0.001$ except for the bank size measure. This means size of the bank is not a measure for its leverage structure, but with positive relationship.

Key Words: Commercial Banks, Portfolio Behaviour, Foreign Banks, Capital Structure, Tanzania

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[†]Lecturer, University of Dar es Salaam, Department of Finance, E-mail: tobias@udsm.ac.tz/ tobyswai@gmail.com

1.0 Introduction

Bank capital structure has an influence on behaviour of the banks (Calomiris and Wilson, 2004; Diamond and Rajan, 2000), that is, such behaviour on allocation of assets and liabilities over time and hence the returns from such investments. Bank capital is influenced by various factors such as regulatory capital, deposit taking capacity as well as amount of loans to be provided to the economy.

Commercial banks (CBs) as business entities are important to the financial sector and important links to economic agents (Fakiyesi, 1999; Lwiza and Nwankwo, 2002). According to Saunders (1994), CBs play five major roles in an economy namely; the intermediation, payment, guarantor, agency and policy roles. The intermediation role is a cardinal one for banks in the economy. It entails mobilization of funds from economic units that have surplus funds and allocating them to those units whose expenditure outstrip their current income and thus need funds for financial and investment purposes. Thus, CBs perform the role of resource transformation and business financing. For a developing country like Tanzania, where development of alternative sources of financing such as stock markets is very limited, the role of CBs in financing business sector activities and provision of liquidity to the economy is incredibly high. Banking firms have fundamental influence on funds allocation, risk sharing and economic growth (Freixas and Rochet, 1997).

The contribution of the banking sector to economic activities depends much on how banks allocate their assets and liabilities, that is, on their portfolio behaviour to create return to the shareholders. Earlier research articulated that bank portfolio behaviour is a key determinant of cost and flow of credit to specific sectors of the economy and hence, banks must be very careful in their allocation of resources (Andersen and Burger, 1969).

Given the role of CBs and their impact on the economy, various discussions have been around regarding bank capital structure. Scholars such as Berlin, John and Saunders (1996) argued that banks are very reluctant in raising equity capital and thus depending much on the internally generated funds. Banks seem to maintain just regulatory capital levels and as long as deposits are secured, they seem to secure many deposits because there is no limit to secure deposits from the public which is debt source of capital to banks. Also, banks seem to have no hard choices in raising debt finance given the nature of its business undertakings (Berlin, 2011). High capital ratios are believed to provide safety net to prevent insolvency while low capital ratios limit banks to raise capital in case of credit crunch (Marini, 2003).

Commercial bank assets structure in Tanzania is highly diversified with more liquid assets than long investment assets. Aikaeli (2006) indicates that out of the legally required 20 percent, for liquid assets, banks maintained an average of 53 percent for the period from 1998 to 2004. A study by the International Monetary Fund [IMF] (2003, 2010) on sustainability of the Tanzania financial sector indicated that in 2002 banks, held a substantial part of government securities and were heavily capitalized and that banks are adequately capitalized with weaknesses observed in small banks.

The banking sector in developing countries like Tanzania, enjoys high profit margins (Aikaeli, 2006). The increased profitability of banks is not always a good sign, for it might cause a huge downturn of the banking sector in case of economic hardships (Paula, 2004) and poor access to financial services. High profitability of the banks has been explained to be a normal feature for banking firms in developing countries (Flamini, McDonald and Schumacher, 2009) given inherent

risks within these economies, Tanzania not being an exception. Evidence showed that foreign banks are more profitable than domestic banks (Claessens, Demirgüç-Kunt and Huizinga, 1998). Other studies (Ahmad, Ariff and Skully, 2008; Calomiris, 1992) reveal that high earnings may indicate that banks take considerably, excessive risks that may lead to credit crunch. In Tanzania studies such as Swai, Lwiza and Ndanshau (2016a and 2016b), studied the portfolio behaviour of the banks in relation to size of the banks and ownership structure. Leverage is key for decision making especially when it comes to risk investment (Bank for International Settlements, 2014). The extent to which banks capital and profitability has been investigated has not been studied, especially in emerging economies. The extent to which banks maintains capital levels and the allocation of the resources to productive us, given regulatory limits, size and ownership is important to be studied in emerging economies. Thus, this study examined whether capital structure explains the portfolio behaviour of a commercial bank.

The study is organized as follows. Section 2 reviews the contextual literature on banking sector in Tanzania, followed by theoretical and empirical literature. Section 4 presents methodology for the study while section 5 presents data analysis and discussion of the findings. Section 6 presents conclusion and recommendations.

2.0 Contextual Literature

Commercial banking sector in Tanzania is one of the oldest business ventures in the country (Swai, 2013; Swai, Lwiza and Ndanshau, 2016a and 2016b). Established in 1905, banking sector was in colonial operation until 1966, with limited branch network and operations. All foreign banks were nationalized and forming one bank, the National Bank of Commerce in 1967. Deregulation of the banking sector was initiated in 1990s to liberalize the financial from state economy, due to the static nature of the economy and failures in the operation of state owned banks (Wangwe and Lwakatare, 2004). The liberalization of the commercial banks in the 1990s pave a way to new regulations which allowed formation of private banks – both locally and foreign.

As of December 2017, the sector has 56 banks, whereby 37 are commercial banks, 11 community banks, three financial institutions, two development financial institutions and five deposit taking microfinance institutions. Seven (7) commercial banks are state owned and 30 privately owned banks, of which 29 were foreign owned (BOT, 2018). Bank of Tanzania (BOT) report on banking supervision 2017, indicates that the banking institutions in Tanzania had 821 branch network. Most of the branches were located in major cities of Dar es Salaam, Arusha, Mwanza, Mbeya and Moshi. Four largest banks have market share of 44.23% of the total banking assets, while local banking institutions have market share of 57.43% of the assets.

There has been an increase in the banking operations in the country for the past five years attributed by the use of agency banking as well as innovations in the information communication technology and mobile banking. The sector has witnessed a growth of total assets from TZS 19.5 trillion in 2013 to TZS 29.8 trillion in 2017 being an increase of more than 52.8 percent. Details of the performance of the commercial banks in Tanzania for the previous 5 years is as shown in table 1.

Table 1: Summary of Financial Soundness Indicators

	Dec-13	Dec-14	Dec-15	Dec-16	Dec-17
Assets Structure					
Total assets growth	14.95	15.11	21.11	2.57	6.76
Investment in Debt Securities as percentage of total assets	18.64	17.24	13.67	14.44	18.62
Investment in Debt Securities growth	26.53	6.45	-3.95	8.33	37.68
Interbank Loans as percentage of total assets	2.3	2.33	3.28	3.64	3.04
Interbank loan growth	-12.47	16.66	70.41	13.96	-10.94
Loans, Advances and Overdrafts as percentage of total assets	50.78	52.89	54.62	55.28	50.78
Loans and Advances Growth	17.12	19.89	25.07	3.81	-1.76
Total Earning Assets to Total Assets	79.76	79.32	78.87	79.22	78.87
Liquid Assets as percentage of Total Assets	36.90	33.21	33.08	31.14	42.05
Liquid Assets Growth	18.07	3.62	20.63	-3.44	44.14
Liabilities					
Current Deposits Growth	13.54	61.54	21.57	(7.31)	5.62
Total liabilities growth	14.29	14.81	20.14	0.92	6.47
Earnings and profitability					
Net interest margin to total income	67	67.8	66.72	52.87	51.99
Return on assets (ROA)	2.55	2.51	2.49	2.09	1.15
Return on equity (ROE)	13.08	12.56	12.16	9.26	4.67
Asset quality					
Gross non-performing Loans to gross Loans	6.43	6.83	7.88	10.27	11.9
NPLs net of provisions to total capital	14.26	16.02	18.59	23.56	23.3
Net loans and advances to total assets	50.85	52.89	54.62	55.28	50.87
Capital indicators					
Share capital to total capital	39.87	38.06	39.08	39.92	41.27
Total Capital growth	19.41	17.1	27.47	12.72	8.53

Source: Extract from BOT (2017 and 2018)

As noted in table 1 banking sector experienced varying growth rates in terms of assets and liabilities as well as assets quality over the period. There has been a decrease a slow pace of increase in bank assets in 2016 and 2017 contributed largely by the implementation of treasury single account (TSA) by the government. It is estimated that about US $437 million were removed from the banking system following the implementation of TSA (Bansi, 2017).

3.0 Theoretical and Empirical Literature

3.1 Theory of Banking

Banks are considered as special institutions and they exist because of two generic reasons: i) They possess certain monopoly powers to do what other firms cannot do, such as accepting deposits; and ii) They have the comparative advantages in providing the services, which can also be provided by others (Llewellyn, 1999). This section outlines important considerations on the theory of banking as well as key features of CBs which affect their capital structure decisions and portfolio holding behaviour.

One of the features, distinguishing a banking institution from other institutions, is the ability of the former to accept deposits and transform them into loan products (Heffernan, 2006). The banking sector is probably the most regulated sector and as a result of regulation, there is a link between capital ratios and portfolio risk of the banks (Baer and McElravey, 1993; Saunders, 1994). Contemporary banking theory classifies functions of banks into four main categories, namely, liquidity and payment services; transforming assets; managing risks; and processing information and monitoring borrowers (Freixas and Rochet, 1997).

3.2 Banks' Objective Function

The banks' objective function has been discussed extensively by various scholars (Fakiyesi, 1999; Parkin, 1970; Pierce, 1967). CBs have a common objective function that reflects owners and management of the banking firms. Due to this objective, bank size, rate of growth of assets and income, stability of reported net income and loan losses, have impact on growth and welfare of the banking firms. The principal objective function of a banking firm is conditioned by the fact that promoters are required by the central bank to meet capital adequacy conditions by depositing an initial capital (K_0) before they commence business at time $t = 0$. When the initial capital is satisfied, the bank is ready to open doors to the public given also it raised economic capital above the initial capital, the bank can collect deposits (D).

The initial capital (K_0), and additional economic capital as well as the deposits (D) can be used to acquire investment assets that give a portfolio of assets ($\sum_{i=1}^{n} A_{t,i}$) of different risks and returns. Bank assets are classified as choice and non-choice assets (Fakiyesi, 1999). Normally choice assets are those earning assets. Depending on the bank's policy; banks do invest differently in varying investment vehicles as well as based on the risks and returns.

3.3 Bank Capital Structure

The empirical literature on determinants of bank capital and the relationship it has with bank portfolio behaviour, efficiency and profitability has been widely researched, with mixed results and observations. Berger, Herring and Szegö (1995), Jia (2009) and Sapienza (2004) provide evidence that capital to assets ratio declined by 55 percent in 1850s to 1990s in the USA banking system. However, a study by Berger, DeYoung, Flannery, Lee and Öztekin, (2008) indicates that banking firms have been maintaining high capital ratios greater than the minimum required by the regulators. A study by Yu (2000) provide evidence that large banks substitute bank capital to that of regulators because they feel that they are 'too big to fail' and that banks depend mainly on internal cash flows for capitalization. Swai (2013) found that bank size and ownership have implications on the bank's portfolio choice.

Diamond and Rajan (2000) drew evidence that capital structure affects liquidity and credit creation and hence profitability of the banking firm. Flamini et al., (2009) present a negative correlation between public ownership and profitability, while foreign ownership does not significantly affect earnings. Ahmad et al., (2008) found that there is a correlation between bank capital and bank management risk taking behaviour. Studying the bank capital of New York banks in 1920s, Calomiris and Wilson (2004) documented that lending and low cost sources of capital prompted banks to increase their assets portfolio and maintain low default risk on deposits during the study period. Jacques and Nigro (1997) examined effects of risk-based capital, portfolio risk and bank capital and noted that there were increasing capital ratios with decreasing portfolio risk in

commercial banks in the USA during the first year of implementation of risk-based capital standards. Swai (2018) found that de-novo banking firms invest differently than matured firms.

3.4 Capital Structure and Portfolio Behaviour

Recent literature on bank capital focuses on the impact of capital on banking portfolio risk that in turn affects the assets and liability allocation. A lot of debate exists, however, due to failures of regulatory capital proposed by the Bank for International Settlements (BIS) in the past and the proposed new regulatory framework on risk to the banking firms, known as Basel III.

Shrieves and Dahl (1992) found a positive relationship between capital ratio and portfolio risk for the USA during the period 1984 to 1986. Rime (2001) applied the same methodology used by Shrieves and Dahl to analyze the capital structure of Swiss Banks and confirmed positive relationship between the capital ratio and portfolio risk. Kleff and Weber (2008) using generalized method of moments (GMM) to the Germany banking sector reported existence of a positive relationship between portfolio risk and capital for savings banks, but not for other higher capitalized banks.

Calomiris and Wilson (2004) are of the view that when a bank accumulates more capital it increases its holding of risk assets; and, its non-performing loans can create a big consequence to the economy as they reduce the bank capital and raise leverage. Gropp and Heider (2010) reported that deposit insurance and capital regulation, to some extent, impacted the USA and European Union (EU) banks' capital structure between 1991 and 2004. It is evident that bank capital and the structure affect the risk taking behaviour of the banks, which in turn, affect the portfolio holding of CBs. Normally, in adjusting to new capital structure or the regulatory capital requirement, banks need to adjust their choice of assets as well in order to ensure a constant or an increase in return to the shareholder's wealth. Several studies have supported adjustment of the capital structure and portfolio behaviour to be valid, especially in lending (Demirguc-Kunt, Detragiache and Merrouche, 2010; Fraser and Rose, 1973; Gambacorta and Mistrulli, 2004; Nachane and Ghosh, 2001). Swai (2013), indicated that capital structure of banking sector in Tanzania is comprised more of internally generated funds and inclined more to deposits and banks maintains just minimum regulatory capital needs, especially for the foreign owned banks in Tanzania.

3.5 Bank Size, Ownership and its Implication to Capital Structure and Portfolio

Ownership structure of commercial banks can have influence on the allocation and choice of assets. Ownership creates some confidence in offering loans and deposit mobilization by the commercial banks. Considering the 2007/09 financial crises, it is believed that most banks that had local presence, for example, community banks and purely focused on one sector or economy within a country did not face a huge impact like multinational banks. Studies also indicated there has been differences in the performance between locally owned banks and foreign owned ones in allocation of assets and liabilities.

Evidence worldwide shows that foreign entry of CBs and hence, foreign ownership have improved efficiency and competitiveness of the banking sector (Claessens et al., 1998; Clarke, Cull, Martinez, Peria and Sánchez, 2002; Micco, Panizza and Yañez, 2007; Satta, 2004; Sengupta., 2007; Swai, 2013; Unite, Tabios and Sullivan, 2002).

There are, however, some different findings, which indicate that foreign banks' entry is no longer associated with competitiveness. Presence of large banks in local economies has impact on profitability and efficiency of the banking system in the economy (Taboada, 2011; Swai, 2013).

In other studies, it is also evidenced that foreign banks have different funding sources and different allocations of their choice assets and that acquisition of small banks in local economies has no impact on their lending behaviour inclined to foreign firms (De Haas and Naaborg, 2006; Swai et al., 2016a). There are also differences, which exist between government owned banks (Jia, 2009; Sapienza, 2004) in risk taking behaviour and performance compared to other privately or jointly owned banks.

It can be noted from the literature that there are a lot of discussions regarding the role of bank ownership in economic development of countries, which are affected by the way the banks allocate their resources. There is also a mixed findings on the ability of the banks to mobilize and grow their deposits and thus enhance their capital structure. Related to this is the ability of the banks to invest in choice items and the results of such investment given policy changes. Bank ownership has impact on portfolio investment; local banks have more advantage to mobilize deposits than foreign banks (Swai, 2018). On other hand, ability to mobilize deposits is one strength and the structure of the deposits is more important. This forms debate for this study i.e. the capital structure considering the nature of bank deposits and the portfolio behaviour of banks.

Based on the discussions and in analysing the impact of capital structure on portfolio behaviour for the CBs for the period under study, the following statements were hypothesized. Hypothesis 1: Capital Structure is positively influenced by the portfolio behaviour of the commercial banks. Hypothesis 2: Bank Size has influence on the way Capital structure impacts the commercial banks. Hypothesis 3: Bank Ownership has influence on the Capital structure of the commercial banks

4.0 Methodology

4.1 Approach

This study focused on examining whether capital structure can be explained by the portfolio behaviour of commercial banks in Tanzania. Its main assumption is that commercial banks exist as institutions that pursue specific objectives reflected by the managers and owners of the firm which is shareholders' wealth maximization (Brealey, Myers and Allen, 2006; Fakiyesi, 1999; Parkin, 1970). Hence, the philosophical stance of this research was on objectivism epistemology, also referred to as functional epistemology (Suddaby and Greenwood, 2009). Suddaby and Greenwood (2009) indicate that in functional epistemology, institutions are viewed as discrete and structural objects. For this case, individual banks are treated as independent organizations.

Capital structure is measured based on the Basel III leverage ratio (Bank for International Settlements, 2014) which is capital measure divided by the total assets. Capital measure in this regard is Bank's core capital and the exposure measure is average total assets (i.e. average total assets in period t and period t-1). Kagan and Murphy (2019) argues that tier 1 assets is a good measure of leverage as the assets can be liquidated if the bank needs quick capital in the event of crisis. According to Bank for International Settlements, when a bank's leverage ratio is greater than or equal to 4%, it is considered to be well-capitalized. If its leverage ratio is 3%, the bank is considered adequately capitalized. The bank is undercapitalized if its leverage ratio is less than 3%. If the bank's leverage ratio is less than 2%, it is considered significantly undercapitalized.

Bank portfolio behaviour is defined as "a process of allocating a given amount of wealth (defined as total deposits) between non-earning assets (required and excess reserves) and earning assets that is, loans and investments" (Andersen and Burger, 1969). In this regard, the wealth of a banking firm is summation of total available funding for investment at any particular time. The variables used is loans to total assets (lota), government securities investment to total assets (gsta), interbank

loans to total assets (inbta) and non-earning assets to total assets (noearta). Dummy variables were introduced for Bank size and Bank ownership to cover hypothesis 2 and 3 respectively.

4.2 Data Type, Source and Statistical Measurements

The researcher used annual financial statements data from the commercial banks published in public newspapers as per the Bank of Tanzania regulations forming a fixed balanced fixed panel data. Data was considered from 20 banks from 2002 to 2017. The data forms 320 observations. Banks studied had an average of 89 percent of the total banking industry assets, 85 percent of the total deposits, and 79 percent of total loans. This period of study was important to measure the implication of the liberalization of the financial sector in Tanzania. Stable and fixed bank samples was considered to involve banks which were available consistently during the time of study. Banks that failed and/ or merged between 2002 and 2017 were removed from the sample.

Bank Size was measured by the natural log of total assets ratio (Yinusa, Adelopo, Rodianova and Luqmon, 2019). Ownership was considered majority local or foreign ownership of the banks as defined by Swai (2013). Data collected was subject to various correlation tests. Cleaning process was undertaken including data plotting and cleaning for the outliers. The regression model was developed in the following form.

$$\text{t12ta}_{i,t} = \alpha_i + \gamma\text{lota}_{i,t} + \beta gsta_{i,t} + \rho\text{inbta}_{i,t} + \emptyset\text{noearta}_{i,t} + \partial_{i,t} \ \ldots (1)$$

Where by

t12ta = *core capital to average total assets in period t and period t-1*

lota = *loans to total assets*

gsta = *government securities investment to total assets*

inbta = *interbank loans to total assets*

noearta = *earning assets to total assets*

i = commercial bank and t is time period

t = time period for t = 1 to T

γ, β, ρ and θ = the k x 1 matrix of parameters association with the associated regressors

$\partial_{i,t} = stochastic\ error\ term$

$\propto_i = constant\ term$

For fixed effect (FE) model, the assumption here is that the regressor vectors i.e. lota, gsta, inbta and noearta can be observed directly from the data unlike the constant term$\propto_i$, and thus, correlated with the regressors. An ordinary least regression of the observed dependent variable (t12ta) on the observed independent variables (lota, gsta, inbta and noearta) was undertaken.

For random effect model (RE), assumption is that the constant term $\propto_i$ is not correlated with the dependent variables and thus, it plays a role as explanatory variables. Although not included in the model, in banking sector profit seeking behaviour contributes to the capital of the firm and at the same they are used to acquire assets, thus, profit seeking behaviour and loses affects dependent and independent variables. Is it also noted that the bank internal policies and changes in the management, recapitulation, growth and technology or skills set affects its performance and may be linked to dependent and independent variables for individual banks. Finally, changes in macroeconomic policies and regulatory requirements on time t = 1 to T; may influence both dependent and independent variables specified in the model.

Hausman test for model was performed as regard to the constant term $\propto_i$ (Green, 2008), to choose between these two regressions models. Considering the independent variable as Y, given that the equation has more than one regressor we may call this X with associated time-invariant regressor referred to as Z. It follows that at least one X and one Z are uncorrelated with the constant term $\propto_i$. Equation (1) can be written as:

$$Y_{i,t} = \mu X'_{i,t} + \beta Z'_{i,t} + \partial_{i,t} \ \ldots (2)$$

Where I = 1, …, N and t = 1, … T, and

$$\partial_{i,t} = \rho_i + \theta_{i,t} \ \ldots (3)$$

To choose between these two regressions models of FE and RE, Hausman (1978) specification test was conducted to examine whether the difference between the random effects regression and the fixed effects regression is zero, given that:

$$E(\rho_i | X_{i,t}) = 0 \ \ldots (4) \text{ and } E(\rho_i | X_{i,t}) \neq 0 \ \ldots (5)$$

For equation (4), if this holds, the choice FE and RE coincides meaning that variability of the individual effects is large relative to the random errors. Results under question (5) indicated that FE is consistent and RE is inconsistent and thus the choice will be to use FE. The choice between FE and RE reveal STATA results as presented in table 2.

Table 2: Fixed Effect and Random Effect Hausman Test Results

	Coefficients			
	(b)	(B)	(b-B)	sqrt(diag(V_b-V_B))
	FE	RE	Difference	S.E.
lota	.0737527	.0718987	.0018541	.0110239
gsta	.0900874	.0845281	.0055593	.0107679
inbta	.0538914	.0580784	-.004187	.0093769
noearta	.0870292	.0812743	.0057549	.0113974

Note. b = consistent under Ho and Ha; obtained from xtreg

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

Test: Ho: difference in coefficients not systematic

$\chi^2\ (4)\ =\ (\mathrm{b}-\mathrm{B})'[(\mathrm{V_b}-\mathrm{V_B})\hat{}(-1)](\mathrm{b}-\mathrm{B})$ From Table 2.
$= 4.87$
$Prob > \chi^2\ = 0.3005$
Where $\chi^2\ = Chi - Square$

The results suggest the use of fixed effect model.

5.0 Data Presentation, Results and Discussion of the Findings

5.1 Data Presentation

The 20 sampled banks recorded an increase in the capital and investment in various asset classes over the study period. The analysis indicates that the banks have maintained a paid up capital that is just enough to cover the amount needed by the bank regulators, especially for the foreign banks. It was also noted that some banks were not adequately capitalized as indicated in Table 1. Another notable aspect in the banking sector is that most banks are serving urban clients. Banks have been expanding physical to serve clients in urban and suburban towns. Development of the innovations in the offering of financial services has made access to financial services possible through the use of mobile phones and agency banking. With the current undercapitalization as defined in Basel III (Bank for International Settlements, 2014); the implementation of such regulation will make many banks in Tanzania either to merge or close their business and they will fail to expand to reach more clients in the rural areas.

Table 3: Analysis of the Leverage Measures for the Studied Commercial Banks

	Basel III Leverage Measure (t12ta)				**Total**
	Significantly undercapitalized (t12ta < = 2%)	Capitalized (t12ta 2%>3%)	Adequately capitalized (t12ta 3% > 4%)	Well capitalized (t12ta = >4%)	
2013	12	6	1	1	20
2014	14	4	2	0	20
2015	12	6	2	0	20
2016	9	9	2	0	20
2017	7	7	5	1	20
Total	54	32	12	2	100
2013	60.0%	30.0%	5.0%	5.0%	100.0%
2014	70.0%	20.0%	10.0%	0.0%	100.0%
2015	60.0%	30.0%	10.0%	0.0%	100.0%
2016	45.0%	45.0%	10.0%	0.0%	100.0%
2017	35.0%	35.0%	25.0%	5.0%	100.0%
Total	54.0%	32.0%	12.0%	2.0%	100.0%

Ordinary least square correlation of the variables studied were checked for correlation and results is as presented in table 4. It can be noted that non-choice assets (non-earning assets involving cash, required reserve and investment in fixed assets) have negative correlation with choice assets. This

is due to the fact that an increase in the choice asset, reduces the non-choice asset and the opposite is also true, up to the legal requirement threshold.

Table 4: Correlation Matrix of the Studied Variables

	Leverage	Loans	Government Securities	Interbank Loans	Non Earnings Assets
Leverage	1.0000				
	293				
Loans	0.0067	1.0000			
	0.9092				
	293	320			
Government Securities	0.0367	-0.5589	1.0000		
	0.5319	0.0000			
	293	320	320		
Interbank Loans	0.0379	-0.0481	0.0287	1.0000	
	0.5179	0.3909	0.6095		
	293	320		320	
Non Earnings Assets	-0.0473	-0.5931	-0.2146	-0.4264	1.0000
	0.4202	0.0000	0.0001	0.0000	
	293	320	320	320	320

Summary of the observed variables is as indicated in Table 5. The measure of leverage has 293 observation due to the fact that the measure was based on average assets from time t and that of time t-1, and cleaning for the outliers which was conducted. Some of the banks (government owned banks) experienced a negative leverage. The results suggest significant effect on the changes in portfolio behaviours should the bank reduce its earning assets. It can be observed that there is a moderate negative correlation (-0.59) and it is significant. This suggests that an increase in the non-earning assets such as cash decreases the investment in loans. Thus, generally 35% of the correlations in the investment in loans [Note. $(-.5931)^2 = 35.18\%$] is attributed to the banks holding of non-earning assets.

Table 5: Summary of the Observed Variables

Variable	Obs	Mean	Std. Dev.	Min	Max
Leverage	293	0.026	0.011	0.010	0.070
Loans	320	0.464	0.135	0.022	0.787
Government Securities	320	0.161	0.102	-	0.656
Interbank Loans	320	0.031	0.058	(0.003)	0.291
Non-Earnings Assets	320	0.340	0.125	0.061	0.702

As noted in table 5, some banks invested up to 78.7% of their total assets in loans, with average mean of 46.4% and others have invested up to 65.6% of their assets as government securities in varying periods of time, with average mean rate of 16.1% for the 16 years of analysis. Also other banks experienced negative balances with other banks and others invested up to 29.1% of their assets to interbank loans.

5.2 Results

Summary for the results based on the three hypothesis and the respective models are presented in Table 6.

Table 6: Summary of the Results on the Effect of the Capital Structure on Commercial Banks Portfolio Behaviour

	Model 1	Model 2	Model 3
Loans	0.07**	0.07**	0.07**
	(0.018)	(0.019)	(0.018)
Government Securities	0.09***	0.09***	0.09***
	(0.018)	(0.018)	(0.018)
Interbank Loans	0.05**	0.05**	0.05**
	(0.017)	(0.018)	(0.017)
Non Earnings Assets	0.09**	0.09**	0.09**
	(0.022)	(0.022)	(0.022)
Bank Size		0.00	
		(0.002)	
Ownership (local)			-0.01***
			(0.001)
_cons	-0.05**	- 0.05	- 0.05*
	(0.018)	(0.018)**	(0.017)
R-squared (N)	0.7413	0. 7363	0.7412

Note. N= 293. Standard Errors of estimated coefficients are in parentheses. Model I presented a general model for hypothesis 1, Model 2 is based on the Size of the bank based on natural log of total assets. Model 3 is based on the ownership of the bank *p <0.05 **p <0.01 *** p <0.001.

5.3 Discussion of the Results

The general model (Model 1) indicates a positive impact on the capital structure measured by leverage (t12ta) in a fixed effect model, controlled for endogenous changes in the capital change. Banks are highly regulated, although the measure of the capital structure considered the most recent provision of capital measure (Basel III), the regulation of the banks helped to adjust the bank capital levels. Study revealed changes in the capital ratios over time given the growth of bank assets and profitability of the bank which if not distributed fully, contributes to the bank capital. The study findings are similar to Calomiris and Wilson (2004), Kleff and Weber (2008), Rime (2001), Shrieves and Dhahl (1992) and Swai (2013).

The size effect model (Model 2) is not significant in explaining capital structure of commercial banks in Tanzania. This may be contributed to the measure which was used to capture the bank size which is natural log of assets. This is also attributed from the fact that bank size is not a constant variable as a single bank may change from one class of bank size to another, across the 16 years of study. Using other measure such as grouping of the banks based on the size clusters, studies by Akhavein, Berger and Humphrey (1997), Goddard, Molyneux and Wilson (2004), Bikker and Hu (2002); Molymeux, Lloyd-Williams and Thornton (1992), Short (1979), Swai (2013) and Swai et al. (2016b) present evidence that bank size affects portfolio behaviour of

banking firms. The results suggests that the capital structure affects the portfolio behaviour, attributes of size i.e. how big or small banks are may not be the effect since the banks may grow naturally to acquire assets to a level where it can adjust its assets structure. While it is true that larger banks can raise cheap sources of funds (in this case, customer deposits) to enhance its assets base, the ratio of non-earning assets also increase with the bank size – in terms of cash position, investment in the physical assets such as branch network and automated teller machines. In the previous years before the implementation of treasury single account, large banks (in terms of branch network) and government owned banks had access to the government funds and thus accumulated cheap deposits (transferrable deposits). To exclude biasness of such measures, the measure of the bank size based on the natural log of the total assets was considered.

The ownership effect model (Model 3) indicated that the capital structure is significant within the measure implies that the dummy variable local banks have impact on the leverage of the banking firms. Foreign banks proved to have a significant effect on the measure of the impact of capital structure. This can be explained by the fact that there is not distrinction in the capital requirement by local or foreign firms and since capital is a regulatory measure, local banks might have more advantage in leverage structure. Most of the local banks are privately owned and hence adjustment of capital to meet the regulatory needs through internal funding mechanism is possible. In previous studies such as De Haas and Naaborg (2006), Swai (2013) and Swai et al (2016a), ownership structure had impact on the portfolio behaviour based on the profitability of the firms and reasons explained including access of foreign banks to more expertise in managing portfolio and impact of the parent bank to support strategies of local foreign firms easily.

6.0 Conclusion and Policy Direction

The study examined whether capital structure influence the way the banks make investment based on their available portfolio. Banks have limited classes of investment namely choice assets and non-choice assets. A leverage measure for capital structure based on Basel III provision was adopted. It was noted that out of the 20 banks only seven (30%) were well capitalized with leverage ratio above 3%. Further analysis indicates there is undefined pattern of the banks in meeting this measure. Since Basel III is not implemented in Tanzania, the data and analysis was based on the fact that banks maintain minimum regulatory capital on absolute amounts and not based on the percentage as suggested by Basel III.

Capital structure measured tier 1 capital divided by the total assets (leverage) is considered to be important in portfolio holding measured on how banks invest between choice assets (earning assets namely investment in loans, government securities and interbank loan market) and non-choice items (non – earning assets namely cash, required reserves and investment in fixed assets). Using fixed panel of 20 banks annually for 16 years, it is evidenced that capital structure of banks significantly depends on the way they invest also on the threshold provided by regulatory on non-earning assets.

Comparison between ownership and bank size reflect the same. As bank increase in size, it adjusts itself to the investment strategies to reflect their investment in both choice and non-choice variables. Results are consistence in the previous studies such as Anarfo (2015), Swai et al. (2016b). The findings considered that there is uniformity in the business model for the studied banks to a large extent.

The study provides policy directions which is based on the concerns on the leverage measure of the banks – which in the adoption of the Basel III can lead to massive bank closure if not monitored. There is also need for investment diversification as the study noted differences in investment behaviours foreign and local commercial banks.

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