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

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Abstract

This study examined the impact of bank capital structure on the portfolio behaviour of commercial banks in Tanzania by using panel financial statements data of 14 banks from 1998 to 2010 on a quarterly basis. The studied banks had more than 85% of the total commercial banks assets on average during the time of study. The study objectives were to analyze the impact of the capital structure to the portfolio performance of commercial banks with respect to the size of the bank and ownership. Financial statements data from the 14 banks were collected from published bank data. Findings revealed that banks are heavily financed by debt sources of finance. It is also revealed that bank expansion to attract deposits through branch network and various products are important in shaping the capital structure. Deposits are cheap sources of finance for commercial banks. Based on the bank size model, it was revealed that the size of the bank has impact on capital structure of the bank which was measured by leverage ratio. Foreign banks have more been found to have impact on their leverage as compared to the local banks.

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

INTRODUCTION

Commercial banks (CBs) as business entities are important to the financial sector and important links to economic agents, and therefore, they form an important vehicle for economic development (Fakiyesi, 1999; Lwiza & 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 capital allocation, risk sharing and economic growth (Freixas & 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 & Burger, 1969). Banks leverage is also important in resource allocation and determines the returns to the shareholders.

Statement of the Problem

Bank capital structure has an influence on behavior of the banks (Calomiris & Wilson, 2004; Diamond & Rajan, 2000), that is, such behavior 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. 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).

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. 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).

Commercial bank assets structure in Tanzania is highly diversified with more liquid assets than long investment assets. Banks maintain high liquidity positions. Aikaeli (2006) indicates that out of the legally required 20%, for liquid assets, banks maintained an average of 53% for the period from 1998 to 2004. A study by the International Monetary Fund (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 Tanzania enjoys high profit margins (Aikaeli, 2006) and they has been stable as well as insolvent even with 32% of its outstanding debt being non-performing (Assaf, Barros, & Matousek, 2009). 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, & 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, & Huizinga, 1998). Other studies (Ahmad, Ariff, & Skully, 2008; Calomiris, 1992) reveal that high earnings may indicate that banks take more risk and a higher risk leads to credit crunch.

This study explores the impact of the capital structure to the portfolio behavior and performance of the commercial banks in Tanzania. While leverage is good for commercial banks to some extent, this affects the portfolio behavior over time. This inquiry is studied based on banks' size and ownership.

Objectives of the Study

Given the stated research problem, the objectives of the study were three-fold as follows:

i) To analyse the extent to which capital structure of the bank has impact on the portfolio holding of the commercial banks in Tanzania
ii) To determine the impact of bank size to the impact of implication of capital structure to the portfolio holding of CBs in Tanzania
iii) To determine the impact of ownership structure to the impact of implication of capital structure to the portfolio holding of CBs in Tanzania

Theoretical and Empirical Literature

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.

An Overview of the Theory of Banking

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 & 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 & Rochet, 1997). This is due to their ability to channel monetary policies and to protect the safety and soundness of the economic system (Gardner & Mills, 1988).

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 $t = 0$. Whenthe initial capital is satisfied, the bank is ready to open doors to the public and thus, the bank can collect deposits (D).

The initial capital (K_0) and 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 Capital Structure

The empirical literature on determinants of bank capital and the relationship it has with bank portfolio behavior, efficiency and profitability has been widely researched, with mixed results and observations. Berger and Sergio (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 et al., (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.

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.

Capital Structure and Portfolio Behavior

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 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 (1992) 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 behavior 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 behavior to be valid, especially in lending (Demirguc-Kunt, Detragiache, & Merrouche, 2010; Fraser & Rose, 1973; Gambacorta & Mistrulli, 2004; Nachane & Ghosh, 2001).

Bank 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 being a difference 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, & Sánchez, 2002; Micco, Panizza, & Yañez, 2007; Satta, 2004; Sengupta, 2007; Unite, Tabios, & 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). 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 behavior inclined to foreign firms (De Haas & Naaborg, 2006). There are also differences, which exist between government owned banks (Jia, 2009; Sapienza, 2004) in risk taking behavior 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 feeling on the role of foreign owned banks in competitiveness of the banking sectors measured by the reduced interest rate spread. The gap exists on the ability of the banks to mobilize deposits and whether this has impact on the portfolio perfomance.

Methodology

This study focused on examining 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, & Allen, 2006; Fakiyesi, 1999; Parkin, 1970). Hence, the philosophical stance of this research was on objectivism epistemology, also referred to as functional epistemology (Suddaby & Greenwood, 2009). Suddaby and Greenwood (2009) indicate that in functional epistemology, institutions are viewed as discrete and structural objects.

Data Type, Source and Statistical Measurements

The researcher used quarterly financial statements from the commercial banks published in public newspapers as per the Bank of Tanzania regulations forming a balanced panel data for the studied 14 banks from 1998-1 to 2010-4. The data forms 52 observation periods and for 14 banks, giving a total of 728 observation variables on a balanced panel. Banks studied had an average of 83% of the total assets, 85% of the total deposits, 79% of total loans and advances and 81% of the net interest income for the 52 quarters of observation. Quarterly average on interest rates for various investment avenues of the commercial banks were obtained from the Bank of Tanzania publications from the entire period of study. The study assumes no price differentiation among CBs investment avenues.

Bank portfolio behaviour and thus its performance was measured by Return on Equity (ROE), Capital structure was measured by the debt equity ratio (LEVERAGE). Bank Size was measured by the total assets ratio and three bank sizes were identified as per Aikaeli (2006) namely; Large, Medium and Small Banks. Ownership was considered majority local or foreign ownership of the banks.

Data collected was subject to various tests including normality tests. Since the researchers collected financial data; it is concluded that they are affected by many factors which normality test will not hold (Lee, 1985). Lee conducted a Monte Carlo simulation by comparing various ratios, building from an earlier work by Deakin (1972) and concluded that there is no normality in financial data and associated ratios. In banking sector, several studies and tests on financial data have revealed the same observations of non-normality of bank financial data (Bedingfield, Reckers, and Stagliano, 1985; Kolari, McInish, and Saniga, 1989; So, 1994). It is evidenced further that normality distributions are not a vital condition for econometric analysis of the ratios; and, that transformation of the ratios for normality is unnecessary (Fischer, Horn, and Klein, 2007). Thus, from our study normality tests for the data was not performed.

Data Presentation and Discussion of the Findings

Banking Sector in Tanzania

The 14 sampled banks for the study recorded an increase in the total deposits and liabilities held by them . 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. The increase in the number of banks was an important factor for the increase in bank liabilities especially deposit mobilization. The increase in the number of the banks fostered competition that forced already established banks to expand, innovate and learn from foreign banks an aspect which was also observed by Lwiza and Nwanko (2002). Banks have been expanding to serve clients in the suburban towns and areas where access to financial services was previously a nightmare. However, more needs to be strategically done to foster financial innovation and competition in Tanzanian banking sector especially by the local banks.

Table 1. Selected Commercial Banks Performance Indicators of the Sampled Banks for Selected Periods

Figures in Percentage (%)	1998-1	2000-3	2002-4	2005-2	2007-3	2009-1	2010-1	2010-2	2010-3	2010-4
Return on Average Total Assets	2.4	3.7	2.8	2.4	4.2	2.3	1.2	2.4	3.6	5.3
Return on Ordinary Shareholder's Funds	24.5	38.2	34.1	29.1	40.7	19.4	10.7	20.5	30.9	48.0
Net Income before Taxes/ Net Worth	24.6	42.3	41.3	36.4	51.6	23.6	12.9	24.7	37.4	55.0
Net Income before Taxes/ Total Assets	2.4	4.1	3.4	3.0	5.3	2.8	1.4	2.9	4.3	6.1
Net interest Income/Total Assets	1.2	3.6	3.3	2.9	5.0	2.8	1.4	2.7	4.0	5.3
Interest income/Total Income	65.2	64.9	56.2	55.0	57.0	55.1	56.5	56.0	56.0	55.7
Interest expense/Interest Income	47.5	45.8	22.2	18.0	24.7	18.7	23.0	21.5	21.3	20.4
Total Loans/Total Assets	15.6	22.3	23.2	32.1	38.6	48.6	44.3	44.1	44.5	44.1
Net worth/Total assets	10.0	9.6	8.1	8.3	10.3	11.8	11.1	11.8	11.6	11.1
Net worth/Total loans	63.9	43.1	35.0	25.8	26.7	24.2	25.0	26.7	26.0	25.2

Source: Computed from the Sampled CBs Quarterly Financial Statements

Hypotheses Tested

Based on the discussions and in analyzing the impact of capital structure on portfolio behaviour for the CBs for the period under study, the following statements was hypothesized.

Hypothesis 1: *Bank capital structure is positively influenced by the portfolio behaviour of the commercial banks*

Hypothesis 2: *Bank Size has influence on the impact of bank portfolio performance on capital structure*

Hypothesis 3: *Bank Ownership has influence on the impact of bank portfolio performance on capital structure*

A mathematical relationship of the stated hypothesis is as presented in equation below.

$$ROE_{(i,t)} = f(LEVERAGE_{(i,t)})$$

where by i = commercial bank and t is time period .

The hypothesis examines the impact of the bank capital structure measured by debt to equity book ratio (LEVERAGE) on the commercial bank profitability measured by return on equity (ROE).

Summary of the Results

Summary for the results based on the three hypothesis and the respective models are presented in Table 2.

Table 2. Summary of the Results for the effects on capital structure on portfolio behavior

Variable	**Model 1** **Random Effect**	**Model 2** **Size**	**Model 3** **Ownership**
Leverage	0.002 (847.94)***	0.002 (191.87)***	0.002 (189.46)***
_Isize_2	--	-0530 (-0.83)	--
_Isize_3	--	0.2255 (3.91)***	--
_Iowner_1	--	--	-0.108 (-1.96)**
_Ibreak_1	--	--	--
Constant	0.3144 (5.61)	0.261 (7.50)	0.3914 (8.41)
R-squared (N)	0.9802(728)	0.9807 (728)	0.9803 (728)

Note. Size of the bank based on the assets value Quarter 4, 2010. *** Significant at 1% test level, ** Significant at 1% test level.

Discussion of the Results

The general model (model 1) indicates a positive impact on the capital structure of the banks' measured debt to equity book value (LEVERAGE), $z(827)= 847.94$, $p < 0.01$, with error values $\delta_u = 0.19$, $\delta_e = 0.65$ and correlation of the error terms, $\rho_{(u,i)} = 0.08$. However, this was expected for CBs since majority of the banks' debt is also part of the bank assets and banks' own funds investment is on average, 15% of the total assets. The study findings are similar to Kleff and Weber (2008), Rime (2001) and Shrieves and Dhahl (1992).

The size effect model (model 2) indicated strong correlation, $r^2 = 0.98$,significant within the three bank sizes $F(3,724) = 122.84$ $p < 0.01$. The estimations of the portfolio behavior impact by return on equity (ROE) by the capital structure measured by leverage of the bank (LEVERAGE) was found to be significant, $t(727)= 191.87$, $p < 0.01$. Small banks were used as control variable and large banks proved to be significant on the impact of capital structure on the portfolio behaviour, $t(727)= 3.91$, $p < 0.01$. Medium sized banks were not significant, $t(727)= -0.83$, $p = 0.40$. Studies by Akhavein et al., (1997), Goddard et al., (2004), Bikker and Hu (2002), Molymeux and Thornton (1992) and Short (1979), present similar arguments between bank size and profitability. The results confirm that larger banks can raise cheap sources of funds (in this case, customer deposits) easily. Based on the previous discussion on the portfolio holding, large banks have access to the government funds and thus well trusted. Large banks in Tanzania also have wide branch network which enable them to access the savings deposits in a large catchment area than small banks. Related to this is the ability of large banks to gain access to various specialized financing programmes which are geared at the increase of access to finance such as those provided by the Financial Sector Deepening Trust and the World Bank under the financial sector development project.

The ownership effect model (Model 3) indicated strong correlation, $r^2 = 0.98$, significant within the bank ownership, $F(2,725) = 10834.29$ $p < 0.01$. The estimations of the portfolio behavior impact by return on equity (ROE) by the capital structure measured by leverage of the bank (LEVERAGE) was found to be significant, $t(727) = 189.46$, $p < 0.01$. Foreign banks proved to have a significant effect on the measure of the impact of capital structure on portfolio holding of CBs, $t(727)=-1.96$ $p = 0.05$. Ownership of the banks is also considered to be significant. Foreign banks are significant at p value 0.05, and thus significant at 5 percent test level. The results indicate that foreign banks have more expertise in the management of the portfolios than do the local banks. Expertise can be derived from the employees or the branch networks;

also technology used by the banks in the management of the portfolios and debt levels. Furthermore, foreign banks can access funding from other multinational branches of their parent banks, than do the local banks.

Conclusion and Policy Direction

Capital structure measured by the ratio of debt to total equity (LEVERAGE) is considered to be important in portfolio holding of CBs measured by return on equity (ROE), for the tested models for across time, size effects and ownership effects. Size of the bank is considered to have impact on the way capital structure decisions impacts portfolio holding of CBs. Large banks are proved to have more advantage on leverage compared to medium and small banks. Ownership of banks is also considered to be significant in leverage of the CBs, possibly due to the fact that foreign banks may be more innovative with good expertise and experience from the parent or other multinational branches. It is thus important to create a purposive policy to expand financial services access including to rural areas so as to attract deposits. This will also have impact to the profitability of the banks as well as improve informal economies of the rural areas through lending; and thus reduce poverty levels. It is also important for the local banks to improve their capital structure through deposit mobilization as they have more advantage than the foreign based banks. Deposit mobilization is a cheap and sustainable source of finance to commercial banks.

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