Assessing the Portfolio Behavior of Commercial Banks in Developing Countries: A Literature and Methodological Issues for the Case of Tanzania Commercial Banks

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Abstract

This paper is a work in progress and tries to analyze briefly the literature, proposed hypotheses and methodology for assessing portfolio behavior of commercial banks in Tanzania. Many developing countries have adopted various measures for the economic and trade liberalizations including financial liberalization, Tanzania being unexceptional. Financial sector is believed to be the engine for the economy and economic growth. The liberalization of the financial sector took various forms involving local financial institution and multinational banks of various sizes. The assessment of portfolio behavior of the commercial banks has received little attention to these developing countries especially on the extent to which the commercial banks invest in various assets and the return they realize out of these investments. The literature suggests an optimal profit maximization model in portfolio allocation, by the use of both choice and non choice variables to be relevant in analyzing bank behavior. In the proposed study the researcher proposed the use of quarterly bank financial statements in a panel form for a period of over 10 years and inclusion of bank qualitative variables over the period of study, in a profit maximization equation.

Introduction

Background

The Tanzania banking sector comprises about 80% of the financial assets in the economy. Currently there are 41 deposit taking financial institutions of which 36 are commercial banks. According to Aikaeli, (2006) about 50% of the bank assets were held by three large banks, namely, CRDB Bank Limited, NMB and NBC between 1998 to 2004.

The structure of the commercial bank assets are diversified with more liquid assets that affect penetration of financial services to more economic sectors. There is more diversification on the number of assets held by the financial institutions recently than two decades ago before the liberalization of the financial sector. However, banks have diversified holding of financial assets, and maintains high liquidity positions. According to Aikaeli (2006), out of the legal required 20% for the liquid assets, banks maintained an average of 53% for the period 1998 - 2004. The study indicates that the percentage which is going to the economy as loans and advances is nearly equal to the balances held by banks as cash and other clearing items. In a developing economy like Tanzania, one expects that banks would strategically invest to the avenues which enhance more economic development while at the same time maintaining their normal returns and risk exposures.

Banking sector in Tanzania enjoys high profit margins (Aikaeli, 2006) and they are stable and insolvent even with 32% of its outstanding debt become non performing (IMF, 2003). The increased profitability of banks is not always a good sign as it might cause a huge downturn of the banking sector in case of economic hardships (Paula, 2004) and poor access to financial services. The profitability of the banks has been explained as a normal feature for banking firms in developing countries (Flamini, McDonald, & Schumacher, 2009) given the inherited risks, Tanzania being unexceptional. Ahmad, Ariff and Skully (2008) indicated that high earnings banks take more risk and higher risk leads to credit crunch. This observation is similar to a study by Calomiris (1992).

Commercial banks are considered as important links to economic agents, and thus are important vehicle for economic development (Fakiyesi, 1999). The contribution of the banking sector to the economic

activities depends much on how the banks allocate their assets and liabilities. Freixas and Rochet (1997) argued that the banking firms have fundamental influence on capital allocation, risk sharing and economic growth. Andersen (1969) argued that bank portfolio behavior is a key determinant of the cost and flow of credit to specific sectors of the economy.

Statement of the Problem

Despite of the fact that the banks in Tanzania are liquid and adequately capitalized, they do not contribute significantly to economic growth and development (IMF, 2003). The contribution to economic growth and development by the commercial banks depends much on how strategically the bank's balance their assets and liabilities, and sources of funds available to commercial banks in terms of capital sources and deposits mobilization, on the other hand. The Bank of Tanzania report indicated that in 2007, while over 80% of the bank's assets were financed by deposits; only 30% - 40% were invested in the loans. A study by International Monetary Fund (2003) indicated that in 2002 banks were holding a substantial part of government securities. This may result to interest risk increase and lack of funding to other economic activities but at the same time it lowers exposure to credit risk by banks.

Studies in portfolio behavior reflect different perspectives on whether there are differences in portfolio holding of commercial banks between developing and developed world (Arjoon, 1994; Fakiyesi, 1999). Studies available were carried out before the implementation of the Basle Accord II and liberalization of financial sector in their respective countries of analysis; and therefore there is a need to track the recent changes in portfolio behavior in banking system in developing countries. A study on the behavior of the commercial banks in a developing country perspective, post financial liberalization is important. In the case of Tanzania the study is even more important for several reasons. Firstly, banks are highly profitable and there is a long cry of the business sector to lack access to finance and secondly, it is important to find out how commercial banks invest in various avenues and examining the returns. It is equally important to analyze the qualitative variables such as technology, human resources and regulatory implications in the determination of the portfolio of commercial banks.

Research Objectives

The main objective of the proposed study is to determine the portfolio behavior of commercial banks in Tanzania after the financial liberalization and Basle Accord II. Specific objectives of the study are to:

a) Examine the portfolio behavior of the commercial banks in Tanzania in relationship to size and ownership; and,
b) Determine the extent to which specific bank related factors affect portfolio behavior of the commercial banks in Tanzania.

Literature Review

Structure of Commercial Banking in Tanzania

Before 1990s, the structure of commercial banks in Tanzania was very simple with few assets and liabilities. After the liberalization of the sector and the need for regulation of the banking sector, the structure of the commercial banks balance sheets has increased with more items. The structure of the commercial bank assets are diversified which indicates to have more of liquid assets and hence affect the penetration of the financial services to more avenues. The percentage which is going to the economy as loans and advances is nearly equal to the balances held by banks as cash and other clearing items (Aikaeli, 2006).

According to the recently Bank of Tanzania publication (BOT, 2009), as of Dec 2007, the equity capital of the banks was 4% and 7% of other non equity capital. According to the report, the ratio of total capital

in relation to risk weighted assets and off balance sheet exposure stood at 22%. The report further revealed that, five largest banks command 59% of the total banking capital and 67% of total loan portfolio for the banking sector as well as 65% of the deposits.

Theoretical Literature

Theory of Banking.

Freixas and Rochet (1997) defined a banking firm as an institution whose current operations consist in granting loans and receiving deposits from the public. The underpinning theory of banking firms emphasizes the fact that the banking firms are special institutions which reacts to its regulatory environment to optimally allocate its assets. The provision of deposit and loan products normally distinguishes banks from other types of financial firms (Heffernan, 2006). Contemporary banking theory classifies banking functions into four main categories namely liquidity and payment services, Transforming assets, Managing risks and Processing information and Monitoring borrowers. Historically, banking firms are highly regulated and supervised firms (Saunders, 1994). This is due to their ability channel monetary policies and thus to protect the safety and soundness of the economic system (Gardner & Mills, 1988). The banking sector is probably the most regulated sector (Baer & McElravey, 1993).

Banks have a fundamental influence on capital allocation, risk sharing and economic growth (Freixas & Rochet, 1997). This is due to the fact money as scarce resources are demanded by various economic units. There is evidence that the portfolio behavior of the banks is shaped by the regulatory activities rather than the general equilibrium which is chosen by the banks in response to the asymmetric information problems (Calomiris & Wilson, 2004). The main focus of the study is on two functions of banking firm which are transformation of assets and risk management.

Commercial Banking Portfolio Selection.

Modern financial theory holds that the assets and liabilities can be viewed as comprising some components of portfolio, which can be optimized. Early study on portfolio maximization was pioneered by Markowitz (1959) whereby the initial model was based on the maximization of portfolio returns for one period measured by the variance and standard deviation. Further improvement of the portfolio theory was done by Klein (1971) who introduces the issue of multiple periods in the modeling as well as other variable.

The usual analysis of portfolio behavior considers the problem of allocation of asset levels of banking institution given a certain portfolio size (Parkin, 1970). Bank portfolio behavior has been defined as a process of allocating a given amount of wealth (defined as capital plus total deposits, between nonearning assets (required and excess reserves) and earning assets (loans and other investments) (Andersen & Burger, 1969).

Considering the structure of assets in the balance sheet of a commercial bank, in period t, total assets (TA_t), are the sum of Cash (C_t), required reserves (RR_t), loans (L_t), investment in Government securities (GS_t), and other assets (OA_t). The relationship can be summarized as:

(1) $TA_t = C_t + RR_t + GS_t + L_t + OA_t$

The percentage of a bank's deposits invested in different assets is invariant with respect to time path of deposits. Within a given period portfolio adjustments can be taken into consideration the impact of deposits. Diversified bank portfolio can be optimal in absence of uncertainty if not all assets have secondary markets. In developing countries case like Tanzania this is likely to happen due to the absence of secondary market due to the lack of derivatives markets. In this case there is no incentive and

advantage for banks to hold excess liquidity as outlined in Aikaeli (2006). As long as the relation $r_l > r_s > 0$ holds, the optimal portfolio is not affected by changes in deposits or interest rates.

Banks are assumed to choose simultaneously through a planning horizon a volume and mix of their assets and liabilities. Klein (1971) develops a model which has three categories of assets and three liabilities category. The assets are cash (C), government securities (GS) and loans (L) while categories of liabilities are demand deposits (DD), time deposits (TD) and equity capital (K).

The bank is assumed to maximize in a single period its returns measured by the expected profits, out of the given value of funds. Klein model on the expected return, assume that expected profits and can be presented as:

(2) $Max[E(\pi)] = gGS + l_s L - [r_{dd} DD + r_{td} TD + \varphi]$

Where: r_{dd} and r_{td} are returns in demand deposits and time deposits respectively and φ is the cost associated with adjustments in deficiencies in liquidity.

Empirical Studies

Commercial bank portfolio behavior had been researched for more than a century now. Firstly, advocated by Edgeworth (1888) who studied the importance of random deposit variation in the determination of a bank's optimum portfolio. Several studies (Gupta, 1985; Pierce, 1967; Walker, 1997) have been carried out in developed world, especially US and European countries on the behavior of commercial banks portfolio on various aspects especially in relation to money supply using time series data.

In Africa, perhaps there are two pioneer studies which examine portfolio behavior of banks in South Africa by Dennis (1979) and in Nigeria by Fakiyesi (1999). Dennis studies the portfolio behavior of South African banks as related to the economic performance in relation to loans in the private and government sector. The study by Dennis utilized data from 1965 to 1975. Dennis (1979) findings indicated that there is a strong relationship between economic growth and private lending. The study argues that banks regard lending to the government i.e. investment in treasury bills as a constraint on their preferred lending to private sector.

Research Hypotheses

The reviewed literature on portfolio behavior of commercial banks provides room to suggest hypotheses for the study based on the research objectives.

Hypothesis 1: *The portfolio choice of Tanzania commercial banks is stable over time*

Previous studies assume constant portfolio holding. The stability can be measured in a general equation which involves changes in the portfolio allocation and measures for the standard deviation and means. Thus for all banks at time t;

(3) $A_{i,t} \neq A_{i,t-1} \rightarrow A_{i,t} = f(A_{i,t-1})$

Where

$A_{i,t}$ is investment of funds on asset A by bank *i* for period *t.* Equation (3) develops a trend by the use of first order autoregressive (AR) model.

Hypothesis 2: a) *The portfolio holdings of commercial banks is different across time within same banks.* This can be measured by a multiple regression equation based on the fixed effect model. For individual bank 1 in time t = 1, 2, 3, … n.

(4) $A_{1,t} \neq A_{1,t-1} \rightarrow A_{1,t} = f(A_1, t-1)$

Hypothesis 2: b) *Portfolio holding of commercial banks in Tanzania depends on the size of the banking firm.* Utilization of a multiple regressions by assigning dummy variables 0 for small firms, 1 from medium sized firms and 2 for the big firms can be considered. In analysis of variance, with the null hypothesis: H_0: $\mu_0 = \mu_1 = \mu_2$, and the alternative: H_a: at least two of the means are not equal. Where0 stands for small, 1 for medium and 2 for large banks.

Hypothesis 2: c) *Portfolio holding of commercial banks in Tanzania differs according to the ownership structure.* A multiple regression model based on assigning dummy variables 0 for local banks and 1 for the foreign banks will be used. In analysis of variance, with the null hypothesis: H_0: $\mu_1 = \mu_2$ and the alternative: H_a: $\mu_0 \neq \mu_1$. Where 0 stands for local and 1 for foreign owned banks.

Methodology

Neuman (1997) identified three broad theoretical perspectives in research methodology namely positivism, interpretive and critical social science. Also, he recommends the possibility of combining two or more the methods (known as triangulation).

Research Design

The research uses quantitative financial data (panel data). Panel data has various advantage one being the fact that it provides informative data, more variability, less collinearity, more degrees of freedom and efficient (Gujarati, 1999). It employs the results from the quantitative data to develop a tool to assess the bank specific factors as a follow up stage of data collection. The follow up stage to specific bank data collection will benefit the study from gaining a better understanding on the managerial and endogenous which affect bank's portfolio management. Baumol (1967) argued that behaviour of the firm is likely to respond to managerial rather than ownership interests and thus interviews with the managers of the banking firm will be very important. Thus this study will apply the 'dominant-less dominant" design as suggested by Creswell (2009). The positivism approach will be a dominant one and the interpretive approach will be less dominant supporting approach.

Model Specification, Data Requirement and Measurement

Model Specification.

The model to be used in portfolio maximization behaviour will be based on profit maximization equation to the individual and total banks under as follows

(5) $\pi_{i,t} = \beta_0 + \beta_{i,t}\bar{\hat{v}}'_{w,(i,t)}\hat{W}_{i,t} + \varepsilon_{i,t}$

Where

$\pi_{i,t}$ is the profit of bank *i* for time period *t.* The profit will be taken as differences between interest income and interest expenses of the banking firm. $\bar{\hat{v}}'_{w,(i,t)}$ is the average actual rates of returns in percentage per period of time (quarter) for the individual assets and banks to corresponding time period. $\hat{W}_{i,t}$ is the reduced value of the choice and non choice variable under consideration such that $\hat{W}_{i,t} = \dfrac{W_{i,t}}{\sum_{i=1}^{n} TA_{i,t}}$ and

$\varepsilon_{i,t}$ is the random variable.

This model is referred as fixed effect model for the banking behaviour. This basically implies that the intercepts may differ according to the banking firms but individual's intercept does not vary over time (Gujarati, 1999).

Data Collection Procedures and Management.

Data will be collected from Bank of Tanzania databases from 1998-2010. The period is chosen due to the fact that the data will be publicity available following the 1997 disclosure regulation. Another limiting factor is that before 1998 it the study will not be rich in data and it will exclude two major banks namely National Bank of Commerce and National Microfinance Bank which were both established in 1997 following the split of the former National Bank of Commerce. In absence of the data from the central banks the researcher will follow the publication of the individual bank data from the published newspapers for the period of study. The data collected will be entered in a spread sheet programme corresponding bank reporting variables.

For the follow up stage, collection of individual bank data will utilize semi structured interviews to Directors of Finance and Treasury Managers of the selected banking firms. The interview will seek to examine bank specific factors related to the portfolio selection, challenges, unique characteristics and considerations, problems and prospects. According to Lwiza and Nwankwo (2002) the use of organizational leaders as "key respondents" is relatively widespread in strategy research (Bowman & Ambrosini, 1997). Farrell and Reinhart (1996) noted that the professional portfolio managers are important participants in the portfolio management process.

Data Analysis and Model Fit Evaluation

The study will utilize panel data analysis techniques by the use of Stata®. Panel data models allow will give room for construction and testing the time-series data to be collected. In most cases, financial data will be reduced and made ready for analysis by the use of spreadsheets. Trends and other statistical inferences will be analysed spreadsheets and Stata®. Given the challenges in management of the time series data, specific tests will be done for cleaning missing variables and outliners. Various tests will be done to ensure that the data fits the proposed models for the study.

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