



Global Advanced Research Journal of Management and Business Studies (ISSN: 2315-5086) Vol. 4(6) pp. 216-226, June, 2015
Available online <http://garj.org/garjmbs/index.htm>
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Full Length Research Paper

Examining the Bank Specific Determinants of Profitability among Commercial Banks in Namibia

Johannes Peyavali Sheefeni Sheefeni,

Department of Accounting, Economics and Finance, Polytechnic of Namibia, Windhoek, Namibia
Email: peyavali@gmail.com

Accepted 26 June 2015

This paper analyses the bank-specific determinants for commercial bank's profitability in Namibia. The study employed the techniques of unit root, cointegration, impulse response functions and forecast error variance decomposition on the quarterly data covering the period 2001 to 2014. The results reveal that capital adequacy, credit risk and liquidity risk as the main determinant of commercial bank's profitability in Namibia. This suggests that the quality of loan portfolio determines the profitability of banks. Moreover, the bank has the ability to fulfill its obligations to the depositors. Lastly, the banks have required level of capital that enable them to withstand credit, market and operational risks they are exposed to in order to absorb the potential loses and protect the bank's debtors.

Keywords: bank-specific, commercial bank's profitability, Namibia, unit root, cointegration, impulse response function.

INTRODUCTION

It is generally accepted that a profitable banking sector is better positioned to withstand negative shocks as well contribute to the stability of the financial system. Commercial banks are financial institutions whose profits are affected by numerous factors and these factors include elements that are internal to each financial institution and external forces influencing the earnings of these institutions (Ani, Ugwunta, Ezeudu and Ugwuanyi, 2012).

The Namibian banking industry is characterized by an oligopolistic market structure in which a few institutions dominate the industry (Andongo and Stork, 2005). As of December 2013, the structure of banking sector still

continues to be dominated by the four major commercial banking institutions with a Herfindahl- Hirschman Index (HHI) of 2729 (Financial Stability Report 2014) in December 2013, compared to 2734 points June 2013. Market structure in which few large firms have a large market share is believed to have a positive impact on corporate profit. Profitability of the banking sector has been on the increase, in particular, profitability indicators of the banking sector remained relatively high by international standards and reached their highest levels as of end 2013. Banking sector profitability, as measured by Return on Asset (ROA) and Return on Equity (ROE), increased from 2.11 percent and 21.98 percent at the end

of June 2013 to 2.37 percent and 24.82 percent, respectively, as at the end of December 2013 (Bank of Namibia Annual Report, 2013).

The nature of the market structure of the Namibian banking industry could pose a high risk nature in that it may be posing a natural barrier of entry in order to preserve the industry's profit. However, changes and advances in technology make the banking sector environment to become very complex, more competitive and more challenging to the manager. Therefore, in the midst of rapid domestic economic and financial sector transformations, an efficient management of banking operations aimed at maximizing growth in profits and efficiency requires an understanding of all the factors that determines the profitability of banks (Kutsienyo, 2011).

According to the Financial Stability Report (2014), the special examination of the banking sector better known as the stress-test shows that the banking sector continue to operate in a manner which ensures that indicators used to measure the health of the institutions remain within accordance of regulatory requirements. In particular, financial soundness indicators for the banking sector remain at comfortable levels by international standards. The resilience of the commercial banks is regularly tested and current stress testing results suggests that the commercial banking institutions are able to withstand shocks in the banking system. The only concern is the assets of banking institutions, which are highly concentrated in mortgage loans, and thus, requires continuous monitoring. Notwithstanding the concerns raised, the banking sector remains compliant with regulatory liquidity requirements. However, in a country where the financial sector is dominated by commercial banks, any failure in the sector has enormous potential effect on the economy.

Over the years, the Namibian banking sector has witnessed some intervention measures acted upon by the regulatory authorities in response to internal and external economic developments and shocks. This includes the Financial Intelligence Act (FIA) which was passed on July, 20, 2007 by the parliament of the

Republic of Namibia. This Act deals with money laundering control measures within the Republic of Namibia. In addition, in August 2008, the Banking institution of Namibia has issued a determination on the localization of core banking systems. The purpose of the determination is to ensure that the core banking systems are located in Namibia. Furthermore, this determination applies to all banking institutions authorised by the Bank of Namibia and that they have to conduct their banking business in Namibia, as well as covers all their fault tolerant core banking systems. The determination became effective on August 11, 2008. (Financial Stability Report, 2008) Therefore, it is reasonable to assume that these measures might have changed the way commercial banks in Namibia operate and consequently, their performance. In this regard, Kutsienyo (2011) argued

that, due to the changing banking environment, profitability which is the major criteria to measure performance of banks has come under intense pressure and it is critical to the survival of commercial banks for a number of reasons. Firstly, dividends are paid from profits (cash profits) and secondly, profit is an important source of retained earnings (residual profits after dividends are paid). These earnings are important component of bank capital.

The relevance of the study on the profitability of commercial banks is informed by the dominance of few banks in the banking sector. Thus, failure in the banking system might result in deep economic repercussion. Secondly, banking sector reforms are likely to affect the way banks operate and hence their performance. Finally, bank profitability is an important source of retained earnings; a very important component of bank capitalisation, providing a margin of protection during recessionary periods, and enabling the banks to be more resilient against external shocks. Therefore, if the determinants of profitability are well observed and explored it will strengthen the foundations of domestic financial system (Kutsienyo 2011).

Though many studies have been conducted on the banking profitability elsewhere in the world, little is known about Namibia. Therefore, the objective of this study is to investigate the bank-specific determinants of profitability of commercial banks in Namibia. The paper is organized as follows: the next section presents a literature review. Section 3 discusses the methodology. The empirical analysis and results are presented in section 4. Section 5 concludes the study.

LITERATURE REVIEW

Theoretical Literature

The theoretical framework on commercial bank's profitability acknowledges and concluded that bank performance is influenced by internal factors. According to Soyemi, Akinpelu and Agunleye (2013) internal factors originates from bank's financial statements such as balance sheets and/or profit and loss accounts, hence referred to as bank specific or micro determinants of commercial bank's profitability. The variables used to represent the internal factors include variables such as size, capital risk, credit risk, liquidity risk, management expenses among others (Weersainghe and Perera, 2013). Athanasoglou, Sophocles and Matthaïos (2005) also listed the same factors as critical in determining the performance of the commercial banks. The scholarly analysis of these factors usually follows the CAMEL framework which stands for Capital Adequacy, Asset Quality, Management Efficiency, Earnings Ability and Liquidity (Dang, 2011). Ongore and Kusa (2013) looked at each of these indicators in greater detail as discussed

below.

Capital adequacy is the level of capital that banks are required to hold to enable them withstand credit, market and operational risks they are exposed to in order to absorb the potential losses and protect the bank's debtors.. This is a critical factor in the sense that capital itself is the amount of the bank's own fund available to support the bank's business at all times and it also serves or acts as a buffer in strained situations. Therefore, banks capital creates liquidity for the bank due to the fact that they cannot merely rely on deposit as they are most fragile and prone to bank runs. Capital adequacy is evaluated on the basis of capital adequacy ratio (CAR), which demonstrates the internal strength of the bank to withstand losses when calamity strikes. Expectations are that the higher the ratio, the lower the need for external finance and hence the higher the profit ability of the bank. In this regard, capital adequacy ratio is directly proportional to the resilience of the bank to crisis situations and subsequently, a direct effect on the profitability of banks by determining its ability to venture into different level of risky but profitable ventures.

Asset quality simply refers to the bank's asset which includes among others current asset, credit portfolio, fixed asset, and other investments. Poor asset quality and low levels of liquidity are the two major causes of bank failures. The loan issued by banks is the major asset that generates the major share of the banks income and thus the quality of loan portfolio determines the profitability of banks. In this regard, the downside is the risk of losses resulting from felonious loans and therefore, nonperforming loan ratios are ought to be kept at minimum so as to reflect a state of good health on the portfolio of the bank.

Management efficiency is usually represented by different financial ratios such as total asset growth, loan growth rate and earnings growth rate. The performance of management is habitually a narrative expression through subjective evaluation of management systems, organizational discipline, control systems, quality of staff and many more. However, it can also be expressed quantitatively using some financial ratios of the financial statements as proxies for management efficiency for example the capability of management to allocate resources efficiently, income maximization, reducing operating costs can be measured by financial ratios. One of the ratios used for such evaluation is operating profit to income ratio such that the higher the operating profits to total income (revenue) the more the efficient management is in terms of operational efficiency and income generation. The other ratio used is the expense to asset ratio such that the ratio of operating expenses to total asset is expected to be negatively associated with profitability.

Liquidity management is also one of the most important factors that determine the level of bank performance. The concept of liquidity refers to the ability of the bank to fulfill

its obligations to the depositors. The quantification of liquidity management commonly used is the customer deposit to total asset and total loan to customer deposits. Adequate level of liquidity is positively related with bank profitability.

Having discussed the various determinant of commercial bank's profitability, one is better positioned to give brief descriptions of the various indicators of the bank's performance. The common understanding is that the primary objective for the bank is to make profit, of course not forgetting the other social and economic objectives According to Alper and Anbar (2011), in measuring the profitability of commercial banks there are variety of ratios used of which Return on Asset (ROA), Return on Equity (ROE) and Net Interest Margin (NIM) are the major ones as described below.

ROA is a ratio of Income to its total asset and it measures the ability of the bank management to generate income by employing all resources of the institution at hand. ROE is a financial ratio that referred to as net profit divided by shareholders'equity. NIM measure the difference between the interest income made by banks and the amount of interest paid out to their lenders (depositors), relative to the amount of their (interest-earning) assets.

Empirical Literature

A number of studies have empirically looked at the various bank-specific determinants of commercial bank's profitability. Below is a list of few selected empirical studies on the abovementioned subject.

Short (1979) and Bourke (1989) studies were among the pioneering work on bank profitability. In particular, Short (1979) finds a positive relationship between size and profitability of a bank, through lowering the cost of raising capital for big banks. However, Weersainghe and Perera (2013), outlined the common factors/determinants influencing profitability identified by several researchers such as cost, size, capital, liquidity, credit risk as internal factors/Bank-specific determinants

In the US, Smirlock (1985) used data from 2700 state banks operating in a particular region for the period 1973 – 1978. The results revealed that once market share is controlled for, concentration (market share) does not determine bank profit rate. However, Berger (1995) employed the methodology of structural models of two market-power hypotheses and two efficient-structure hypotheses are expressed in testable reduced form profit equations to test the four hypotheses of market concentration, market share, X – efficiency and scale efficiency in a single specification. In utilising 30 separate cross-sectional datasets, the result shows the presence of relative market power hypothesis and partial support for X – efficiency approach.

Naceur (2003) investigated the impact of banks

characteristics, final structure and macroeconomic indicators on banks net interest margin and profitability in Tunisian Banking Industry for the 1983-2000 period. Panel data techniques were used particularly both fixed effects and random effects models were estimated. The findings of the study are that high net interest margin and profitability tend to be associated with banks that hold relatively high amount of capital, and with large overheads.

Athanasoglou, Delis and Stakouras (2006) analyzed the effect of selected set of determinants on banks profitability in the South Eastern European region over the period 1998-2002. Using an unbalanced panel dataset, the study reveals that concentration is positively correlated with bank profitability.

Tunay and Silpar (2006) investigated profitability of the Turkish banking sector in the period of 1988-2004 using panel data method. The study revealed that the ratios of equity, non-interest expenditures to total assets, national income and concentration ratio have positive impact on ROE and that the ratio of deposits to stock market capitalization have negative impact on both return on equity (ROE) and return on assets (ROA).

In Turkey, Yildirim (2008) analyzed profitability of Turkish banking sector for the period 2002 – 2007, by employing multiple regression method. The findings reveals a positive relationship between return on assets and the ratio of budget balance to industrial production balance, the ratio of securities to total assets and the ratio of equity to total assets. On the one hand the ratio of off-balance sheet transactions to total assets and the ratio of liquid assets to total assets were identified to have a negative relationship with return on assets.

Sayilgan and Yildirim (2009) examined the relationship between the return on assets and the return on equity ratio for a sample of Turkish banks for the period 2002-2007. The analysis from the monthly data showed that profitability is positively affected by capital adequacy and negatively by growing off-balance sheet assets.

Tregenna (2009) analyses the effects of structure on profitability from 1994 to 2005 using bank level data to test the effect of concentration (market power) bank size and operational efficiency on profitability. Efficiency is not found to be strong determinants of profitability suggesting that banks' high profit during this period were not earned through efficiency performance. Robust evidence is found that concentration increases profitability.

Gul, Irshad and Zaman (2011) assessed the relationship between bank specific and macroeconomic characteristics over bank profitability by using data of top fifteen Pakistani commercial banks over the period 2005-2009. They investigated the impact of assets, loans, equity, deposits, economic growth, inflation and market capitalization on major profitability indicators i.e., return on asset, return on equity, return on capital employed and net interest margin separately. The empirical results found strong evidence that both internal and external

factors have a strong influence on the profitability.

Davydenko (2011) investigated the determinants of bank profitability in Ukraine ranging from bank specific, industry specific and macroeconomic indicators to the overall profitability of Ukrainian banks. The study uses a panel of individual banks' financial statements from 2005 to 2009. Ukrainian banks suffer from low quality of loans and do not manage to extract considerable profits from the growing volume of deposits. This study finds evidence for the difference in profitability patterns of banks with foreign capital versus exclusively domestically owned banks.

Alper and Anbar (2011) examined bank-specific and macroeconomic determinants of the bank's profitability in Turkey over the time period from 2002 to 2010. The bank profitability was measured by return on assets (ROA) and return on equity (ROE) as a function of bank-specific and macroeconomic determinants. Using a balanced panel data set, the results show that asset size and non-interest income have a positive and significant effect on bank profitability. However, size of credit portfolio and loans under follow-up have a negative and significant impact on bank profitability.

Acarvaci and Calim (2013) analysed the bank specific and macroeconomic factors that affect the profitability of commercial banks in Turkish banking sector by using Johansen and Juselius cointegration test approach. Data for the period 1998 to 2011 was collected from the three biggest state-owned, privately-owned and foreign banks and the following variables were used as proxies for profitability of bank namely, return of asset, return of equity and net interest margin. The bank specific determinants, which were thought to have effects on profitability are total credits/total assets, total deposits/total assets, total liquid assets/total assets, total wage and commission incomes/ total assets, total wage and commission expenses/total assets, the logarithm of total assets and total equity/total assets.

Abdullah, Parvez and Ayreen (2014) study examined the bank-specific, industry-specific and macroeconomic determinants of 26 DSE listed bank's profitability in Bangladesh during 2008 to 2011. Panel data approach was used where bank profitability is calculated by return on assets (ROA) and Net interest Margin (NIM) as a function of bank specific, industry-specific and macroeconomic determinants. The findings show that the profitability of the Bangladesh banking sector is determined by bank size, higher cost efficiency, capitalization, higher concentration, regardless of whether ROA or NIM is used as the dependent variable. Credit risk and ROA have a negative relation, whereas the relationship with NIM is positive.

In Ghana, Antwi and Apau (2015) investigated the determinants of financial performance of Rural and Community banks in Ghana. Thirty (30) rural and community banks across the country were purposefully selected for the period 2006-2010 and panel data was

used in regression analysis model to examine the variables that could affect the performance of RCBs. The variables of the regression include credit risk, capital adequacy, portfolio composition, bank size, operational efficiency, gross domestic product as well as inflation (consumer price index). The results from the study reveals that credit risk, non-interest expense, bank's capital strength, gross domestic product, and annual rate of inflation are significant drivers of RCBs' profitability in Ghana. However, bank size and portfolio composition did not have any significant impact on their profitability.

Tuzcu (2015) present the model of the determinants of profitability for the Turkish banking industry by employing a dynamic panel framework for 30 Turkish commercial banks. The study used a comprehensive quarterly data set of bank level, industry level and macroeconomic explanatory variables for the period 2003-2010. The findings were that internal factors such as capital and the credit risk are the most influential ones.

Petria, Capraru and Ilnatov (2015) assessed the main determinants of banks' profitability in EU27 over the period 2004-2011 using panel data approach. The study was split into three categories of factors that influence bank profitability namely; the bank-specific (internal) factors, industry specific and thirdly macroeconomic (external) factors. Bank's profitability was proxied by return on average assets (ROAA) and the return on average equity (ROAE). The empirical findings were that credit and liquidity risk, management efficiency, the diversification of business, the market on centration / competition and the economic growth have influence on bank profitability, both on ROAA and ROAE. An interesting and valuable result is the positive influence of competition on bank profitability in EU27.

Based on the afore-mentioned literature on the bank-specific determinants, one can safely say the following: There are mixed findings due to the variation of the environment and data included in various studies ranging from those refuting and agreeing. There are also different methodological approaches whether it is cross-country or individual country's studies. There is variation in terms of data frequency used. Notably, most studies employed bank data-level and few used aggregated data. There seem to be no study on Namibia that has specifically looked at this subject. It is against this background this study intends to fill the gap and add to empirical literature for Namibia.

METHODOLOGY

In order to analyse the long-run relationship between bank specific and profitability variables, time series econometric methods has been used. This study followed a similar approach as that of Acaravci and Calim (2013). In particular, a vector autoregression (VAR) approach is used in this study as outlined in the next subsection.

Econometric or Analytical Framework and Model Specification

VAR is a system of dynamic linear equations where all the variables in the system are treated as endogenous. To draw the VAR mainframe, assume that the relationship between bank specific determinants and profitability is described by a dynamic system whose structural form equation is given by:

$$Ay_t = \Psi + \Omega_1 y_{t-1} + \Omega_2 y_{t-2} + \dots + \Omega_p y_{t-p} + B\mu_t \dots\dots\dots 1$$

where A is an invertible $(n \times n)$ matrix describing contemporaneous relations among the variables; y_t is an $(n \times 1)$ vector of endogenous variables such that; $y_t = (y_{1t}, y_{2t}, \dots, y_{nt})$; Ψ is a vector of constants; Ω_i is an $(n \times n)$ matrix of coefficients of lagged endogenous variables $(\forall i = 1, 2, 3, \dots, p)$; B is an $(n \times n)$ matrix whose non-zero off-diagonal elements allow for direct effects of some shocks on more than one endogenous variable in the system; and μ_t are uncorrelated or orthogonal white-noise structural disturbances ie the covariance matrix of μ_t is an identity matrix $E(\mu_t, \mu'_t) = 1$. Equation (1) can be rewritten in compact form as:

$$Ay_t = \Psi + \Omega(L)y_{t-i} + B\mu_t \dots\dots\dots 2$$

where $\Omega(L)$ is a $(n \times n)$ finite order matrix polynomial in the lag operator L .

The VAR presented in the primitive system of equations (1) and (2) cannot be estimated directly (Enders, 2004). However, the information in the system can be recovered by estimating a reduced form of VAR implicit in (1) and (2). Pre-multiplying equation (1) by A^{-1} yields a reduced form VAR of order p , which in standard matrix form is written as:

$$y_t = \Phi_0 + \sum_{i=1}^p \Phi_i y_{t-i} + \varepsilon_t \dots\dots\dots 3$$

where $\Phi_0 = A^{-1}\Psi$; $\Phi_i = A^{-1}\Omega_i$; and $\varepsilon_t = A^{-1}B\mu_t$ is an $(n \times 1)$ vector of error terms assumed to have zero means, constant variances and to be serially uncorrelated with all the right-hand side variables, as well as their own lagged values though they may be contemporaneously correlated across equations. The

variance-covariance matrix of the regression residuals in equation (3) is defined as $\Sigma = E(\varepsilon_t, \varepsilon_t')$. Given the estimates of the reduced form VAR in equation (3), the structural economic shocks are separated from the estimated reduced form residuals by imposing restrictions on the parameters of matrices A and B in equation (4):

$$A\varepsilon_t = B\mu_t \dots\dots\dots 4$$

which is derived from equation (4). The orthogonality assumption of the structural innovations is $E(\mu_t, \mu_t') = 1$, and the constant variance-covariance matrix of the reduced-form equation residuals is $\Sigma = E(\varepsilon_t, \varepsilon_t')$. impose identifying restrictions on A and B as presented in equation (5):

$$A\Sigma A' = BB' ; \dots\dots\dots 5$$

matrices A and B are both $(n \times n)$, a total of $2n^2$ unknown elements can be identified upon which $n(n+1)/2$ restrictions are imposed by equation (4). To identify A and B , at least $2n^2 - n(n+1)/2$ other additional restrictions are required. This study uses the generalized impulse response function (GIRF) to avoid the impact of the ordering of variables on the restriction imposed since it does not require orthogonalisation of shocks (Koop, Pesaran and Potter, 1996; Pesaran & Shin, 1998).

The main uses of the VAR model are the impulse response analysis and forecast error variance decomposition. The analysis is carried out in the following order. Before VAR estimation, test for non-stationary (unit root) of time series is essential to determine the order of integration. The test is conducted by employing one or a combination of the Augmented Dickey Fuller (ADF) test, the Phillips-Perrons (PP) and the Kwiatkowski-Phillips-Schmidt-Shin (KPSS) tests (Pindyck & Rubinfeld, 1991; Gujarati, 1995; 2003). Thereafter, the optimal lag length is tested as it affects the VAR model. There are many criteria used to indicate the number of optimal lags namely, Hannan-Quinn (HQ), Schwarz information criterion (SC), Akaike Information Criterion (AIC), Final prediction error (FPE) and Likelihood Ratio (LR). After determining the number of lags it is essential to also check whether VAR satisfies the stability condition. The next step would be to conduct tests for co-integration, i.e. if two or more series have long-run equilibrium. The cointegration test can be applied in several ways, according to the nature of the equation that is tested ie single or multivariate system. If co-integration is found among the variables, the adjustment of the short-run to the long-run equilibrium is obtained through the vector

error correction model (VECM). When co-integration is not found, then a VAR model specification is estimated. Thereafter, the impulse response function and forecast error variance decomposition would be derived from the estimated VAR/VECM.

Data, Data Sources and Data Measurements

The data used in this paper are of quarterly frequency for the period 2001:Q1 to 2014:Q2. Secondary data were obtained from the Bank of Namibia's various statutory publications, Namibia Statistical Agency's statutory publications and from the World Bank.

In analysing bank performance, three measures of profitability were used, Return on Assets (ROA), Net Interest Margin (NIM) and Return on Equity (ROE). ROA is a ratio between net income and total assets, NIM is defined as net interest income divided total asset. ROE is defined as Profit before Taxation (PBT) divided by shareholders' fund. The three above mentioned variables are the regressand or dependent variables in this study. In addition, the regressors (internal determinants) include ratio of total loans to total asset (LOAN), the ratio of liquid assets to total assets (LIQUID), the ratio of equity capital to total assets (CAPADEQ) and log of total asset (LNTA).

EMPIRICAL ANALYSIS AND RESULTS

Unit Root Test

The Augmented Dickey-Fuller (ADF) and the Phillips-Perron (PP) tests were used to investigate the univariate characteristics of the variables as well as to ascertain the order of integration. The use of more than one test is to ensure robustness of the results thereof. Table 1, reports the results of both the ADF and PP unit root tests. The results show that all variables are stationary in levels with the exception of net interest margin and log of total assets. The two variables were further differenced once and became stationary. That is to say, the variable has zero mean, constant variance and the residuals uncorrelated over time. The variables that are stationary in levels means they are integrated of order zero, whilst the variables that are stationary in first difference are integrated of order one.

Testing for Cointegration

Upon establishing the order of integration of the variables, the next step was to test for cointegration among the variables. This was done in order to test for the presence of any long run relationship. In this regard, the Johansen cointegration test based on trace and Maximum Eigen values test statistic was conducted. It

Table 1. Unit root tests: ADF and PP in levels and first difference

Variable	Model Specification	ADF	PP	ADF	PP	Order of Integration
		Levels	Levels	First Difference	First Difference	
ROA _t	Intercept	-3.63**	-4.40**	-9.44**	-14.33**	0
	Intercept and trend	-3.87**	-4.82**	-9.42**	-15.75**	0
ROE _t	Intercept	-5.07**	-5.06**	-8.96**	-19.90**	0
	Intercept and trend	-5.52**	-5.49**	-8.87**	-22.12**	0
NIM	Intercept	-2.03	-2.16	-7.78**	-8.28**	1
	Intercept and trend	-2.12	-2.00	-7.88**	-16.36**	1
LOAN _t	Intercept	-3.67**	-5.88**	-8.88**	-47.06**	0
	Intercept and trend	-5.24**	-6.73**	-7.94**	-48.67**	0
LIQUID _t	Intercept	-3.50**	-4.23**	-8.90**	-9.33**	0
	Intercept and trend	-3.36**	-3.41**	-9.07**	-11.49**	0
LNNTA _t	Intercept	-3.46**	-3.69**	-7.15**	-9.29**	1
	Intercept and trend	-2.99	-3.14	-8.33**	-12.92**	1
CAPADE _t	Intercept	-3.62**	-3.60**	-9.36**	-15.07**	0
	Intercept and trend	-3.75**	-3.74**	-9.27**	-14.83**	0

Source: author's compilation and values obtained from Eviews

Notes:(a)** means the rejection of the null hypothesis at 5%

Table 2. The Johansen co-integration test based on trace and maximal Eigen value – ROA

Maximum Eigen Test				Trace Test			
H ₀ : rank = r	H _a : rank = r	Statistic	95% Critical Value	H ₀ : rank = r	H _a : rank = r	Statistic	95% Critical Value
r = 0	r = 1	97.56	33.88**	r = 0	r >= 1	159.28	69.83**
r <= 1	r = 2	34.72	27.58**	r <= 1	r >= 2	61.72	47.86**
r <= 2	r = 3	14.76	21.13	r <= 2	r >= 3	27.00	29.80
r <= 3	r = 4	9.98	14.26	r <= 3	r >= 4	12.22	15.49
r <= 4	r = 5	2.25	3.84	r <= 4	r >= 5	2.25	3.84

Source: author's compilation and values obtained from Eviews

Note: Both Max-Eigen value and Trace tests indicates 2 cointegrating equations at the 0.05 level (**).

should be noted that cointegration test was conducted with alternating the three measures of profitability namely ROA, ROE and NIM. The results in tables 2, 3 and 4 show a presence of cointegration in all cases as it was supported by both test statistics. The existence of cointegration among the variables suggests that a VECM model can be estimated in order to make long run analysis.

Impulse Response Functions

The results for the IRF show how each measure of profitability respond to the shocks. Figure 1 shows the response of return on assets to shocks in loan. The results show that return on assets responds positively to such shocks and the effects appear to be permanent due to the fact that the variable found a new level of

Table 3. The Johansen co-integration test based on trace and maximal Eigen value –ROE

Maximum Eigen Test				Trace Test			
H ₀ : rank = r	H _a : rank = r	Statistic	95% Critical Value	H ₀ : rank = r	H _a : rank = r	Statistic	95% Critical Value
r = 0	r = 1	98.73	33.88**	r = 0	r >= 1	159.92	69.82**
r <= 1	r = 2	32.97	27.58**	r <= 1	r >= 2	61.19	47.86**
r <= 2	r = 3	14.89	21.13	r <= 2	r >= 3	28.23	29.80
r <= 3	r = 4	11.20	14.26	r <= 3	r >= 4	13.33	15.49
r <= 4	r = 5	2.13	3.84	r <= 4	r >= 5	2.13	3.84

Source: author's compilation and values obtained from Eviews

Note: Both Max-Eigen value and Trace tests indicates 2 cointegrating equations at the 0.05 level.

Table 4. The Johansen co-integration test based on trace and maximal Eigen value – NIM

Maximum Eigen Test				Trace Test			
H ₀ : rank = r	H _a : rank = r	Statistic	95% Critical Value	H ₀ : rank = r	H _a : rank = r	Statistic	95% Critical Value
r = 0	r = 1	105.60	33.88**	r = 0	r >= 1	163.38	69.82**
r <= 1	r = 2	33.20	27.58**	r <= 1	r >= 2	57.78	47.86**
r <= 2	r = 3	16.52	21.13	r <= 2	r >= 3	24.57	29.80
r <= 3	r = 4	7.89	14.26	r <= 3	r >= 4	8.05	15.49
r <= 4	r = 5	0.16	3.84	r <= 4	r >= 5	0.16	3.84

Source: author's compilation and values obtained from Eviews

Note: Both Max-Eigen value and Trace tests indicates 2 cointegrating equations at the 0.05 level.

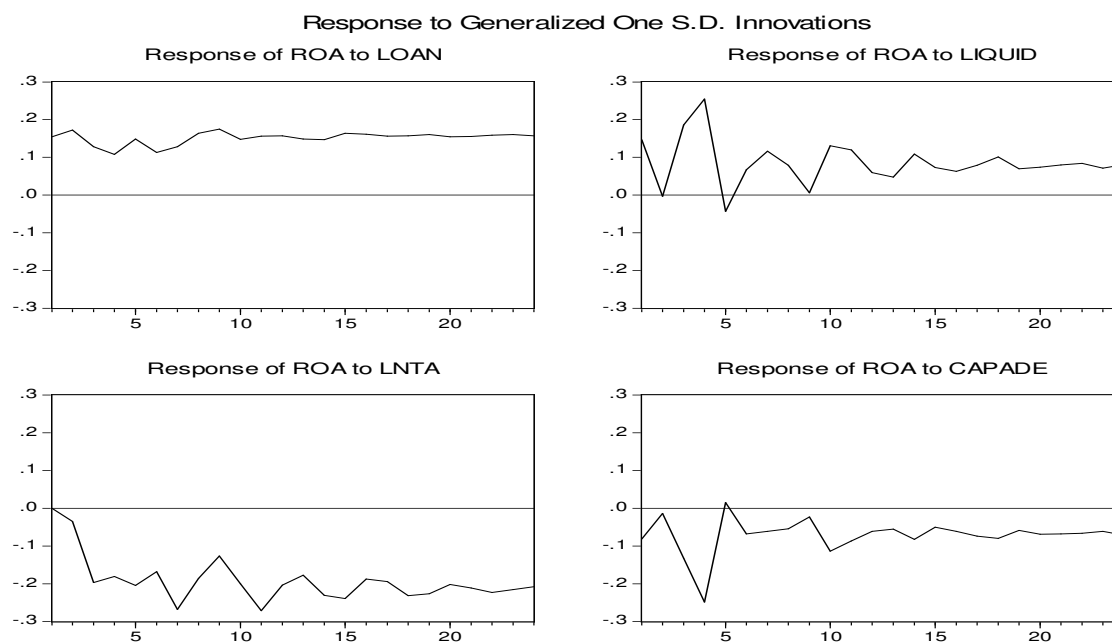


Figure 1. Impulse response functions for return on assets

Source: author's compilation using Eviews

equilibrium as it did not return to its initial level of equilibrium. Theoretically, the loan of a bank is the major

asset that generates the major share of the banks income and thus the quality of loan portfolio determines the

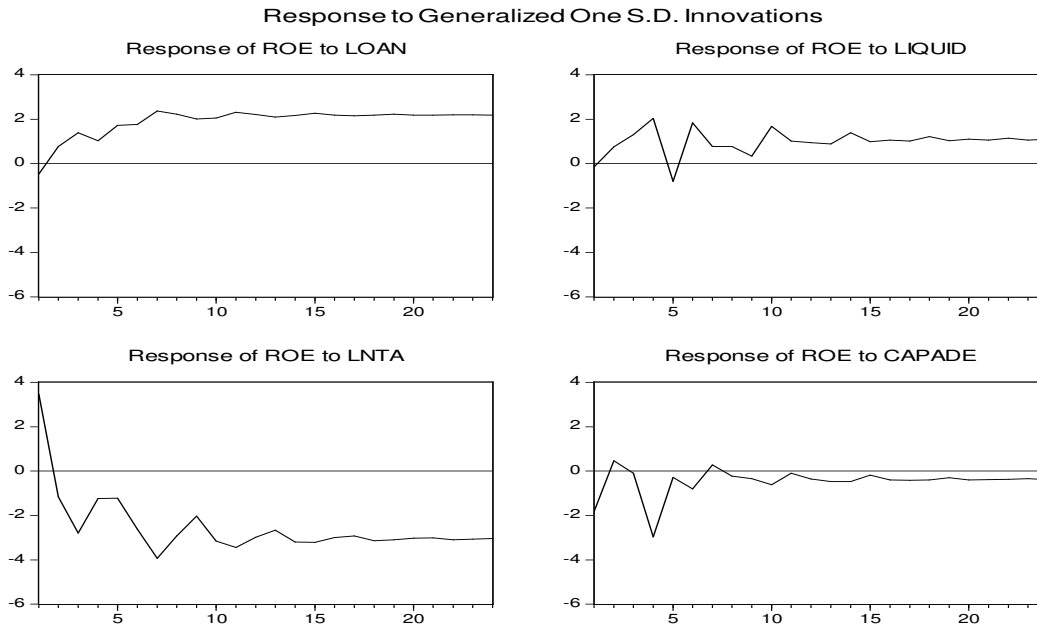


Figure 2. Impulse response functions for return on equity
 Source: author's compilation using Eviews

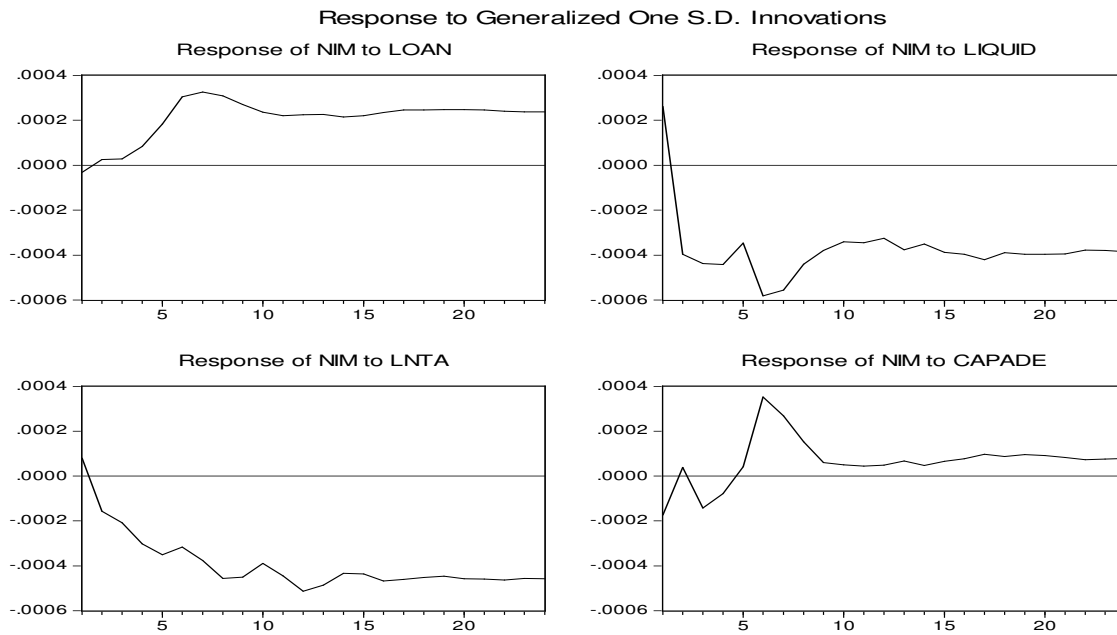


Figure 3. Impulse response functions for net interest margin
 Source: author's compilation using Eviews

profitability of banks. Hence, high quality of loan portfolio will positively affect the profitability of the bank. Similarly, return on assets responds positively to liquid and the effect appear to be permanent but only after 15 quarters. Liquidity refers to the ability of the bank to fulfill its obligations to the depositors. Adequate level of liquidity is positively related to bank's profitability. On the contrary,

the results reveal that return on assets respond negatively to both total assets and capital adequacy ratio.

Figure 2 shows the response of return on equity to shocks in loan. The results show that return on equity responds positively to such shocks and the effects appear to be permanent as a new equilibrium was found. This is in-line with economic theory as the quality of loan

Table 5. Variance Decomposition

Variance Decomposition of ROA					
Quarter	ROA	LOAN	LIQUID	LNTA	CAPADE
1	100	0	0	0	0
6	56.39	5.00	9.81	15.39	13.94
12	48.33	6.46	6.58	25.31	13.32
18	45.24	7.21	4.76	29.12	13.67
24	43.50	7.64	3.66	31.36	13.83
Variance decomposition of ROE					
Quarter	ROE	LOAN	LIQUID	LNTA	CAPADE
1	84.03	0.25	0.03	14.97	0.72
6	70.49	5.12	5.48	11.59	7.32
12	56.90	12.29	5.33	17.87	7.61
18	50.97	15.46	5.67	19.79	8.11
24	47.45	17.35	5.80	21.02	8.37
Variance decomposition of NIM					
Quarter	NIM	LOAN	LIQUID	LNTA	CAPADE
1	100.00	0	0	0	0
6	44.82	2.36	27.57	21.67	3.59
12	39.39	4.29	25.15	28.41	2.77
18	37.45	4.39	24.19	31.27	2.70
24	36.55	4.54	23.72	32.57	2.62

Source: author's compilation and values obtained from Eviews

portfolio determines the profitability of banks. Hence, high quality of loan portfolio will positively affect the profitability of the bank. Similarly, return on equity responds positively to liquid and the effect appear to be permanent but only after 12 quarters. This suggests that the banks have the ability to fulfill their obligations to the depositors. On the contrary, the results reveal that return on equity respond negatively to both total assets and capital adequacy ratio.

Figure 3 shows the response of net interest margin to shocks in loan. The results show that net interest margin also responds positively to such shocks and the effects appear to be permanent as a new equilibrium was found. This is in-line with economic theory as it is the case with other measures of profitability. Similarly, net interest margin responds positively to liquid and the effect appear to be permanent but only after 12 quarters. This suggests that the banks have the required level of capital that enable them to withstand credit, market and operational risks they are exposed to in order to absorb the potential losses and protect the bank's debtors. On the contrary, the results reveal that net interest margin respond negatively to both total assets and liquidity.

To sum up the results, first, capital adequacy which reflects capital risk in the banking sector was found to be a major bank-specific determinant in the Namibian case. These results are similar to those of Sayilgan and Yildirim (2009), Abdullah et al (2014) and Tuzcu (2015) who obtained alike for Turkey, Bangladesh and Turkey respectively. Secondly, asset quality which reflects credit risk was also found to be another important determinant for bank's profitability. Acarvali and Calim (2013), Abdullah et al (2014) and Tuzcu (2015) also obtained

similar findings for Turkey, Bangladesh and Turkey, respectively. Thirdly, liquidity which reflects liquidity risk also appeared as a main bank-specific determinant for commercial bank's profit in Namibia. Acarvali and Calim (2013) found similar results for Turkey. Notably, total assets which reflect the bank size does not feature as a main determinant in the Namibian case.

Forecast error variance decomposition

Table 5 shows the results of the forecast error variance decomposition over the horizon of 24 quarters. The forecast error variance decomposition for ROA is mostly attributed to itself in the first quarter. However, after 12 quarters the variables LNTA and CAPADE also significantly contributed to the fluctuations in ROA. Their contribution has been increasing as the horizon increase. Meanwhile, the fluctuations in ROE are mainly attributed to itself but LNTA taking a notable share in the fluctuations as from the beginning of the horizon. The LOAN also contributed notably as the horizon extend.

The forecast error variance decomposition in NIM are largely due to itself in the first quarter but after 12 quarters the variables LIQUID and LNTA contributed significantly to the fluctuations in NIM as the horizon extend.

CONCLUSION

This study examined the bank-specific determinants for commercial bank's profitability in Namibia. This was done

with the purpose of establishing which of the determinant affects bank's profitability. The study was based on quarterly data covering the period 2001:Q1 to 2014:Q2, utilizing the technique of unit root, cointegration, impulse response functions and forecast error variance decomposition. The results reveal that capital adequacy, credit risk and liquidity risk as the main determinant of commercial bank's profitability in Namibia. This suggests that the quality of loan portfolio determines the profitability of banks. Moreover, the bank has the ability to fulfill its obligations to the depositors. Lastly, the banks have required level of capital that enable them to withstand credit, market and operational risks they are exposed to in order to absorb the potential losses and protect the bank's debtors. The results of these determinants are more pronounced when using ROA and ROE as profit measures in comparison with NIM as a measure for profit. The study recommends that Namibia should continue closely monitoring the determinants identified to position itself well and to pick-up any early warning in case of crisis of any sort.

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