

What Determines Banks' Profitability In Zimbabwean Dollarised Economy? Panel Evidence (2009-2013)

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Abstract: This study attempts to identify determinants of commercial banks' profitability in Zimbabwe since the inception of the multiple-currency system. The study covered from 2009-2013 and multiple linear regression techniques were adopted to examine effects that each explanatory variables has on return on assets, return on equity and net interest margin. Research findings revealed that bank-specific factors have greater influence on bank profitability than other external determinants. The study also identified that banks' profitability was on rollercoaster ride and that there was greater variability in deposits growth among banks since inception of multiple-currency regime. More interestingly, the study evidenced the holding of signalling, expected bankruptcy and efficiency-structure hypotheses in the Zimbabwean banking industry.

Keywords: dollarization, multiple currency system, multiple linear regressions, Zimbabwe.

1. INTRODUCTION

Zimbabwean banking industry underwent substantial changes as we face down the barrel of the Zimbabwean currency history from Zimbabwean dollar era to the multiple currency environment. Various microeconomic and macroeconomic factors reshaped the structure of banks' balance sheet on both the assets and liabilities sides which ultimately altered their profitability equation. Banks play a linchpin role in the financial system as well as in the entire economy. Individual bank's performance has a multiplier effect to the banking industry which will in turn impact the financial system and it is the financial system's performance that will eventually influence the behaviour of an economy. In this regard banks are engines to the financial system and hence heart to the entire economy. It is banking industry's performance that largely determines degree of economic acceleration or deceleration. Positive performance by banks fosters economic acceleration through efficient financial system and likewise shonky performance slows down the whole financial system and hence discourages economic growth.

Following financial intermediation theory, banking institutions assume an intermediary role whereby they match savers and borrowers in the economy. Banks mobilise funds from surplus spending units (SSUs) and provide these funds to deficit spending units (DSUs) at a cost. Banks' profit is the difference between interest they are charged by SSUs and interest they charge to DSUs. However very few individuals are willing to save their funds in Zimbabwe due to a variety of reasons that include wider savings-lending rates gap. Lending rates quoted by banks range between 6% and 35% per annum and deposit rates range from 0.15% for savings accounts, to 20% for time deposits (RBZ, 2014). Apparently the savings-lending rates gap is wide and unjustifiable and such wider gap is a disincentive to savers and borrowers in Zimbabwe.

Total loans and advances rocketed since the adoption of multiple-currency regime as shown in Figure 1. The trajectory indicates upswing in lending business during 2009-2010. The growth was probably due to high loans demand by

individuals as well as corporates that intended to revitalise their businesses that were vehemently disordered during the hyperinflationary era. Total loans and advances increased further during 2010-2011 and this rise stemmed from further rise in loans demand by firms that intended to deepen working capital funding. A further rise in loans and advances was recorded during 2011-2012, although the growth was sluggish relative to prior period.

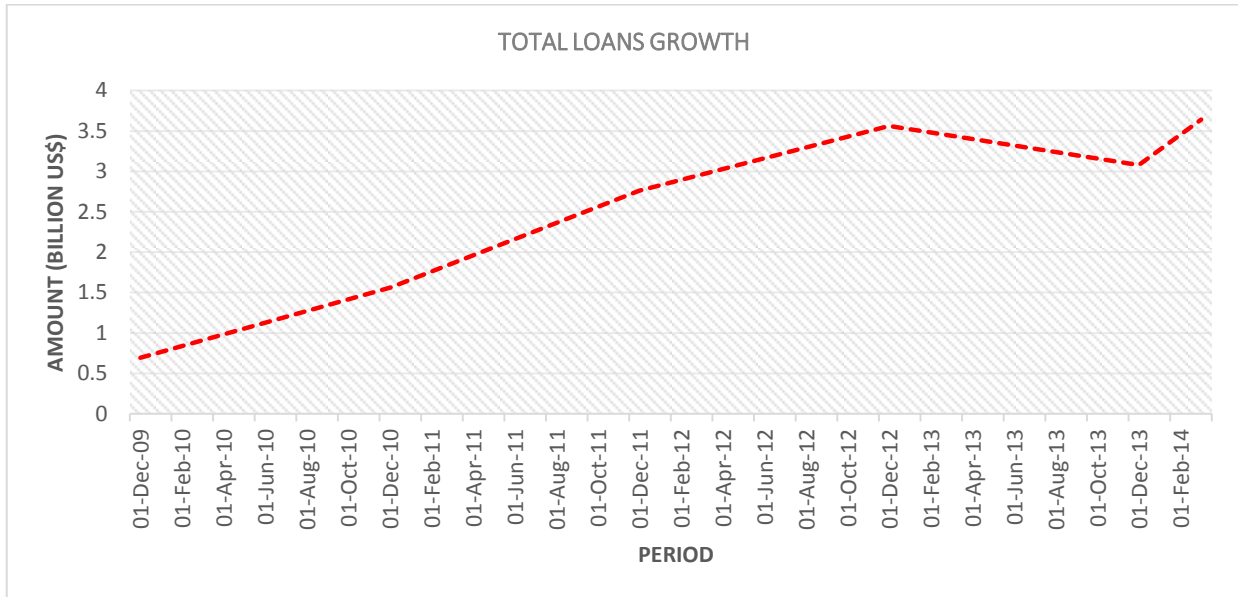


Figure 1: Banking Sector loans and advances trend

Source 1: RBZ (2014)

However total loans and advances level steeply receded during 2012-2013 and such a plummet might have stemmed from increase in distressed companies as witnessed by massive liquidations and closures of firms which perhaps resulted in low demand for loans in the economy.

Zimbabwean banking industry aggregate net profit position escalated from US\$ 4.90 million as at June 2013 to US\$ 13.84 million as at 30 June 2014 and twelve (12) banking institutions out of nineteen (19) recorded profit in the first half of the year (RBZ, 2014). Losses that were posted by banks were largely attributed to high levels of non-performing loans, lack of critical mass in terms of revenue to cover high operating expenses and deliberate strategy by some banks to clean up bad loan books through provisioning (RBZ, 2014). Figure 1 shows trends of banking industry’s performance as well as economic performance.

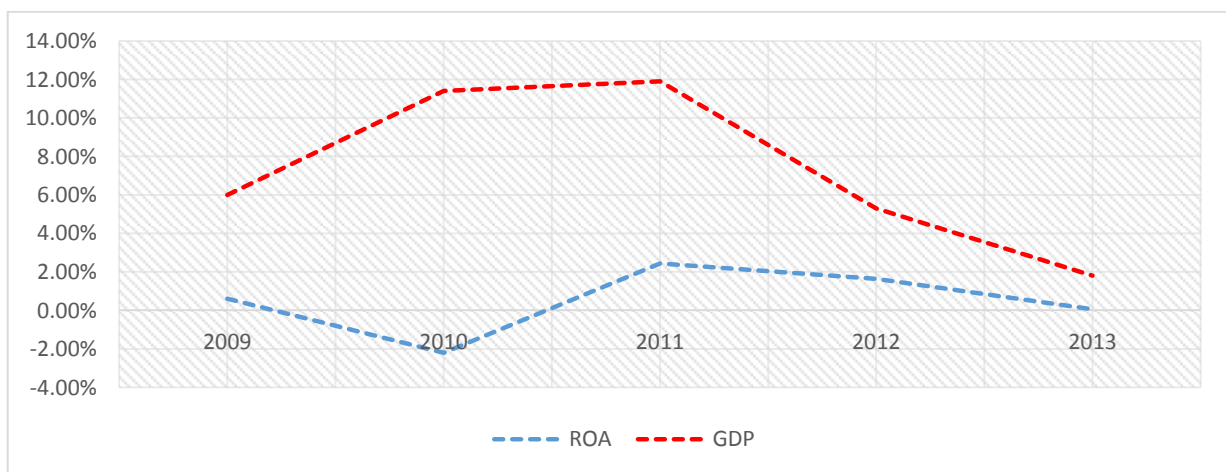


Figure 2: Banking sector performance against GDP growth

Source (RBZ 2014)

Based on behaviours exhibited by trends presented in Figure 2, there was a sharp rise in GDP growth rate during 2009-2010 while ROA drastically dropped during the same time frame. During this period, the economy grew abruptly and banks profitability fell sharply. From 2010-2011 there was slight improvement in GDP growth rate with a corresponding sharp rise in banking sector's profitability. Both GDP growth rate and banking industry's profitability diminished during the period between 2011-2012, albeit at different decay rates. GDP growth rate fell sharply relative to banks' profitability. Simultaneous decline in GDP growth rate and banking industry's performance extended to 2012-2013 financial period.

Bank profitability is a key ingredient to forming banks' resilience to distress and failure. Figure 2 indicated that banking sector's profitability was on roller coaster ride since dollarisation and such trend instigated the need to examine overarching determinants of banks' profitability, amid, internal and external forces. Figure 2 nullified the hypotheses that banks are likely to relent profits during periods of economic acceleration and that positive performance will foster economic acceleration, so what relationship do exist between GDP (*economic performance measure*) growth rate and ROA (*banks performance measure*) variables under the new currency environment?

Several studies were carried out to identify determinants of bank profitability in the world but none of them comprehensively investigated sources of bank profitability under the dollarised Zimbabwean economy. Mbizi (2012) carried out a study on the impact of capital on commercial bank performance in Zimbabwe but didn't reconnoiter on pressures exerted by other internal and external determinants thus this study purports to employ a holistic approach in covering this gap by incorporating both internal and external variables. Dzingirai and Katuka (2014) research findings indicated that profitability was one of the chief causes of bank failures in Zimbabwe under multiple-currency regime but did not scout into what exactly drives banks' profitability. According to Dzingirai and Katuka (2014), profitability is a prominent bank related determinant of bank failures in Zimbabwe and this infers that profitability does matter in bank's survival equation hence it is imperative to determine its sources under the new currency era. The study will help regulatory authorities, bank managers and government in formulating strategies that yields better profitability to banks.

The study seeks to achieve the following objective:

- To identify key determinants of banks' profitability in Zimbabwe under dollarisation.
- To determine the impact that each determinant has on bank profitability.
- To determine whether signalling, expected bankruptcy cost, efficient structure and market power hypotheses apply in Zimbabwe.
- To reveal ways of improving bank profitability.

The study will test the following hypothesis:

- H_0 : External and internal variables are not the major determinants of banks' profitability in Zimbabwe.
- H_1 : External and internal variables are the major causes of banks' profitability in Zimbabwe.

2. LITERATURE REVIEW

This section reviewed theories and suggestions cited in previous studies by other authors. Majority of previous researches suggest that bank profitability is influenced by bank-specific, industry-specific and macroeconomic variables. Bank-specific determinants are, inter alia, bank size, growth of deposits, credit risk, liquidity risk, capital adequacy and operating efficiency. Studies that incorporated industry-specific determinants included industry concentration, ownership and industry size. Macroeconomic determinants included in previous studies were GDP growth rate, inflation rate, effective tax rate and term structure of interest rates.

2.1 Theoretical Literature Review:

The relationship between bank size and profitability is explained by market power hypothesis (MP) which postulates that bank performance is driven by the market structure of the banking industry (Obamuyi, 2013). Market power hypothesis suggest that it is market power that drives bank profitability and the theory assumes a positive relationship between banking concentration and performance. Positive association imply that increase in banking industry concentration raises

banks' profitability and rise in concentration emanates from collusion by individual firms which will, at the end, allow only few banks dominate the market.

Relative Market Power hypothesis is a special case of Market Power hypothesis and explains how market power is enhanced. The Relative Market Power hypothesis posits that only firms with large market share and well differentiated products are able to exercise market power and earn non-competitive profits (Guillen *et al.*, 2014). Market concentration reduces cost of collusion between firms and produces hyper normal profits from exploitation of market power that reduces consumer surplus (Sami, 2011). Banks in more concentrated industries will earn higher profits than those operating in less concentrated industries, regardless of their efficiency (Saleem, 2006). However market power exploitation and collusion by individual banks only exist if the banking system of the country under consideration is mainly characterised by imperfect competition where banks are price makers. Also product differentiation is one of complex issues to achieve in the banking industry due to similarity and oversimplification of banking services especially in the case of the Zimbabwean banking architecture where banks offer akin services countrywide.

A complement theory to explaining size-profitability relationship is the efficiency structure (ES) hypothesis. The hypothesis stipulates that bank performance is positively linked to its efficiency (Saleem, 2006). Improving profitability under efficiency structure hypothesis is better explained by X-efficiency (ESX) hypothesis. X-efficiency hypothesis is the version that increase in managerial and scale efficiency lead to higher concentration and hence higher profits (Athanasoglou, Brissimis and Delis, 2005). Difference in profitability levels between large and small banks explains the role of efficiency in the positive structure-profitability relationship (Sami, 2011). Following this hypothesis, large banks that efficiently managed are more likely to be profitable. However positive linkage between structure and performance is dubious as not all big banks are efficient as the theory assumes and not all bank size proxies are adequate enough to fully explain the size-profitability relationship.

Market power and efficiency structure hypotheses generated modified efficient structure and collusion hypotheses. Modified efficiency structure paradigm posits that performance is a function of bank efficiency and residual influence of market share reflected by factors not related to efficiency such as market power and product differentiation. Market share captures effects which are not related to efficiency such as product differentiation (Sami, 2011). The collusion hypothesis suggests that individual banks may be able to collude which would lead to more expensive loans and lower interest rates on deposits hence higher profit margins. Collusion hypothesis is of the view that concentration influences profitability through market power. The logic behind collusion hypothesis is that when individual banks collude, industry concentration rises and ultimately few banks will control the market. Power to rein the market means freedom to price services without competition thus collusion hypothesis do not hold in perfect markets.

The relationship between bank capital and its earning is explained by a variety of hypotheses such as the signalling hypothesis, expected bankruptcy cost hypothesis and risk-return hypothesis (Obamuyi, 2013). Berger (1995) reviewed the signaling and expected bankruptcy costs hypotheses as two major theories in explaining the positive relationship between bank profitability and capital ratios. Bankruptcy cost refers to the likelihood of bank failure times deadweight liquidation costs which creditors must absorb in the event of failure (Hoffmann, 2011). Shareholders compensate costs borne directly by creditors through higher required rate of return on bank debts. The logic behind this hypothesis is that when expected costs increase as a result of environmental changes that increases the probability of bank failure, the optimal capital ratios increase in order to reduce the likelihood of failing and thereby lower the expected value of bankruptcy costs (Hoffmann, 2011).

Signalling hypothesis explains positive connection that exists between bank capital and its earnings. The hypothesis posits that bank capital level signals to the market of the value of a bank. Higher capital is a positive signal to the market of high or improving value of the bank. Signalling hypothesis suggests that a higher equity ratio is a positive signal to the market of the value of a bank (Heid, Porath and Stolz, 2004). Signalling equilibrium is reached when symmetric information assumption is relaxed where banks that expect to have better performance relay this information through high capital. If management is allowed to have private information about the future cash flows, they may signal private information that the future prospects are good by increasing capital (Berger, 1995). Lower leverage infer that banks perform better than their competitors who cannot raise their equity without further deteriorating the profitability (Ommeren, 2011).

Risk-return hypothesis explain the negative relationship between bank capital and profitability. The hypothesis holds that an increase in risk yields higher returns. Increase in risk can be achieved by increasing leverage, that is, the equity to assets ratio. Ommeren (2011) explained that there is a negative relationship between capital and profitability. If banks anticipate to increase returns and take up more risks, by increasing leverage, the equity to assets ratio will be reduced.

2.2 Empirical Literature Review:

This sections reviews studies that were carried out to attest previously discussed theories and hypotheses. Curak, Poposki and Pepur (2011) analysed bank specific, industry specific and macroeconomic determinants of bank profitability using dynamic panel analysis on sixteen (16) banks in Macedonia. Their research covered 2005-2006 financial period and research variables were return on assets, bank size, solvency risk, liquidity risk, credit risk, fees income, operating expenses, concentration and economic growth. Evidence was that operating expenses management is a key internal determinant of bank profitability. Among external determinants, banking system reform and concentration were identified as significant determinants of profitability in Macedonia.

Studies in Tunisia suggest that bank size negatively impact net interest margin (Naceur ,2003; Naceur and Goaid ,2006). Naceur (2003) opines that concentration was less beneficial to Tunisian commercial banks and that all macroeconomic variables had no impact on banks' net interest margin and profitability. Naceur and Goaid (2006) findings on bank size and macroeconomic variables conformed to those drawn by Naceur (2003). Study by Rachdi (2013) showed that before the US subprime crisis, capital adequacy, liquidity, bank size and yearly real GDP growth rate positively influenced performance of the Tunisian banking sector. Cost-income ratio, yearly growth of deposits and inflation rates were negatively correlated to bank profitability. In crisis, bank profitability was mainly explained by operational efficiency, yearly growth of deposits, GDP growth rate and inflation. Rachdi (2013) findings on bank size differed from those drawn by Naceur (2003) and Naceur and Goaid (2006).

In Nigeria, Aburime (2008) indicated that real interest rates, inflation, monetary policy and exchange rate regime were significant determinants of bank profitability. Obamuyi (2013) showed that improved bank capital and interest income as well as expenses management and favorable economic conditions contribute to higher bank's performance and growth in Nigeria. In Zimbabwe, banks are equally generating their income from both interest and non- interest income generating activities along with lower capital holdings. Sayedi (2013) examined on bank-specific, industrial-specific and macroeconomic determinants of bank profitability using ex post facto type of research design in which data source was secondary only. Study incorporated 15 deposit money bank (DMB) and data ranged from 2006 to 2011 and simple linear regression model was applied for return on assets, GDP, liquidity and market power variables. According to Sayedi (2013) liquidity, market power and GDP have significant positive impact on profitability of DMBs in Nigeria.

According to Athanasoglou, Brissimis and Delis (2005) all bank specific determinants, incorporated in their study, affect bank profitability in Greece and the study found no evidence to support the SCP hypothesis. A similar study was conducted in Greece by Alexiou and Sofoklis (2009) on determinants of bank profitability by using a framework that incorporates the SCP hypothesis and panel data approach was used on six banks. The study used pooled fixed effect and random effect models on return on equity, return on assets, credit risk, liquidity, productivity, efficiency, interest rates, capital adequacy, private consumption, GDP growth rate and inflation variables. Research outcome was that most bank specific variables were significant determinants of bank profitability in Greece.

Javaid, Anwar, Zaman and Gafoor (2011) did internal factor analysis on determinants of bank profitability in Pakistan using top 10 banks over the period 2004-2008. Pooled ordinary least square (POLS) method was used to determine the impact of assets, loans, equity and deposits on ROA. Findings proved that banks with more equity capital, total assets, loans and deposits were profitable. Jabbar (2014) identified internal determinants of bank profitability in Pakistan by taking 31 commercial banks for the period from 2009 to 2012. The researcher employed panel data analysis of common, fixed and random effect models. According to Jabbar (2014) bank profitability is impacted by capital adequacy and size while loan loss provision, deposit growth have negative significant coefficients.

Study by Acarvcı and Calim (2003) indicated that total credit to total assets, total wage and commission expenses to total assets, total deposits to total assets, total liquid assets to total assets, total wage and commission incomes to total assets, logarithm of total assets and total equity to total assets influence bank profitability. Real GDP and real exchange rates also

affect bank profitability. The research findings showed that bank specific have been more effective than macroeconomic variables. According to Akbas (2012) the ratio of loan loss provisions to gross loans, total cost to income, HHI for deposits and inflation negatively correlate with ROA. Ratio of equity to total assets, ratio of loan loss provisions to gross loans, total cost to income, HHI for assets and logarithm of total assets have negative influence on return on equity in Turkey.

Mbizi (2012) analysed on the impact of minimum capital requirements on commercial bank performance in Zimbabwe and findings indicated that there is a significant and positive relationship between commercial bank capitalisation and its performance. However the research was narrowed down to only few capital indicators. The study supported both signalling and expected bankruptcy cost hypotheses as evidenced by positive correlation between capital ratios and bank profitability.

In Europe, Ommeren (2011) examined the determinants of bank profitability in the European banking industry using 2226 bank observations and 354 European banks for the period 2000-2009. Findings showed that the equity-to-assets ratio is positively related to bank's profitability and this was supportive to the bankruptcy costs hypothesis or signaling hypothesis. GDP was positively related to profitability implying that rise in GDP growth rate brings positive shift in bank profitability. In term of effective tax rate and term structure of interest variables, there was no evidence that they are significant determinants of profitability. The study also revealed that among macroeconomic variables, business cycle is the only significant determinant of bank profitability.

Recent study by Ayele (2012) identified determinants of bank profitability in Ethiopia on private commercial banks. The study used a panel data of seven private commercial banks from the year 2002 to 2011 and quantitative research approach was used by using multiple linear regression models. The study applied fixed effect regression model to investigate the impact of capital adequacy, asset quality, bank size, liquidity, managerial efficiency and real GDP growth rate on return on assets, return on equity and net interest margin. Ayele (2012) documents that capital adequacy, bank size, managerial efficiency, level of GDP and regulation strongly influence the profitability of private commercial banks.

A study was conducted by Krakah and Ameyaw (2010) examined on determinants of bank's profitability in Ghana by employing a case study research design on Ghana commercial bank Ltd and Merchant bank Ltd. Their study covered from 1990 to 2009 and they used a combination of ratio analysis and the least square regression model. Results revealed that banks' performance has been highly volatile and that non-interest income, non-interest expenses, size, bank's capital strength, growth in money supply and inflation are significant determinants of banks' profitability in Ghana. Madishetti and Rwechungura (2013) analyzed Tunisian bank using multiple regression model and the study covered from 2006 to 2012. Study variables were liquidity risk, operational efficiency, credit risk, business mix, bank assets, annual GDP growth rate, capital adequacy and annual inflation rate. Findings indicated that capital adequacy, bank size, liquidity risk, operational efficiency and credit risk influence bank profitability. GDP and inflation were not determinants of banks' profitability in Tanzanian commercial banks.

Dietrich and Wanzenried (2009) analyzed the determinants of commercial banks profitability in Switzerland over the period from 1999 to 2006. They used ordinary least square regression (OLS) and their sample included 1919 observations and 453 banks. Dependent variables were return on average assets and return on average equity. Independent variables were equity to assets, cost to income, loan loss provision, yearly growth of deposits, difference between bank and market growth of total loans, bank size, interest income share, bank age, bank ownership, nationality, region, bank category, effective tax rate, yearly change in regional population, real GDP growth, 6 month Libor, stock market capitalization and bank concentration. The study revealed that there exist significant difference in profitability between commercial banks in Switzerland.

Liu and Wilson (2009) investigated on profitability of banks in Japan following the mid-1990s financial crisis. These authors used dynamic model and study variables were diversification, loans to assets, capital to assets, cost to income, market share, industry concentration, percentage of market capitalization of listed companies over GDP, real GDP growth and the ratio of impaired loans to gross loans granted. Findings showed that well capitalized, efficient banks with lower credit risk tend to outperform less capitalized, less efficient banks with higher credit risk. The study also indicated that industry concentration, GDP growth and stock market development influences bank profitability.

Guillen, Rengifo and Ozsoz (2014) analyzed relative power and efficiency as main determinants of bank profitability in Latin America using Data Envelopment Analysis (DEA). Their study included such variables as return on assets, GDP, size and efficiency and findings indicated that microeconomic variables and GDP positively influence return on equity. Size and market concentration positively influence bank performance and that the ES hypothesis hold in Latin America.

In Korea Sufian (2011) analyzed the profitability of commercial banks over the period 1992 to 2003 and the research used 251 bank year observations. The researcher used linear regression and applied the fixed effect model on return on assets, return on equity, market capitalization, GDP, annual inflation, capitalization, concentration, network embeddedness, diversification, credit risk, operational efficiency, liquidity and size. Research findings showed that Korean banks with lower liquidity tends to exhibit higher profitability. The study also indicated that concentration positively influence profitability of commercial banks.

Li (2007) investigated on determinants of banks' profitability and its implications on risk management practices in UK from 1999-2006. The study employed multiple regression analysis and convenience sampling technique on 123 banks in UK. Variables incorporated were return on average assets, liquidity, credit risk, capital strength, interest rates, GDP and annual inflation rate. Results showed that loan loss reserves have a negative impact on bank profitability. All macroeconomic variables had no impact on bank profitability in UK. Capital strength was identified as the main determinant of bank profitability in the study. Hoffmann (2011) examined determinants of profitability of the US banks during the period 1995-2007. Their analysis combined endogenous and exogenous variables through the GMM system estimator. The study incorporated net income to equity, equity to total assets, bank size, deposits to assets, interest expenses to equity and concentration. Findings document a negative relationship between capital ratio and profitability. According to study findings, economies of scale do not occur if one takes into cognizance the size of the bank.

3. DATA AND METHODOLOGY

3.1 Empirical model:

This paper adopted a quantitative approach to examining internal and external determinants of banks' profitability in Zimbabwe. Research analysis considered three profitability measures which are return on assets (ROA), return on equity (ROE) and net interest margin (NIM). Clearly there were more than one dependent variable in the model thus the researcher employed multiple linear regression models. Multiple linear regression analysis captures existence of simultaneous relationships among various dependent and independent variables and works best in identifying effects that each explanatory variable has on each of the profitability measures. Akin model was applied by Li (2007), Ayele (2012) and Madishetti *et al.* (2013). Stata 11 econometric software was used for data analysis. The multiple linear regression models are as follows:

$$ROA_{it} = C_i + \beta_1LTD_{it} + \beta_2ETA_{it} + \beta_3OEM_{it} + \beta_4SIZE_{it} + \beta_5MEF_{it} + \beta_6DSN_{it} + \beta_7DTA_{it} + \beta_8OBA_{it} + \beta_9DGR_{it} + \alpha_1CON_t + \gamma_1GDPT + \gamma_2INF_t + e_i \text{ --- Equation 1}$$

$$ROE_{it} = C_i + \beta_1LTD_{it} + \beta_2ETA_{it} + \beta_3OEM_{it} + \beta_4SIZE_{it} + \beta_5MEF_{it} + \beta_6DSN_{it} + \beta_7DTA_{it} + \beta_8OBA_{it} + \beta_9DGR_{it} + \alpha_1CON_t + \gamma_1GDPT + \gamma_2INF_t + e_i \text{ --- Equation 2}$$

$$NIM_{it} = C_i + \beta_1LTD_{it} + \beta_2ETA_{it} + \beta_3OEM_{it} + \beta_4SIZE_{it} + \beta_5MEF_{it} + \beta_6DSN_{it} + \beta_7DTA_{it} + \beta_8OBA_{it} + \beta_9DGR_{it} + \alpha_1CON_t + \gamma_1GDPT + \gamma_2INF_t + e_i \text{ --- Equation 3}$$

Where:

ROA_{it} = Return on assets of bank i at time t .

ROE_{it} = Return on equity of bank i at time t .

NIM_{it} = Net interest margin of bank i at time t .

LTD_{it} = Liquidity status of bank i at time t .

ETA_{it} = Capital strength of bank i at time t .

OEM_{it} = Operating expenses management of bank i at time t .

$SIZE_{it}$ = Size of bank i at time t .

MEF_{it} = Managerial efficiency of bank i at time t .

OBA_{it} = diversification and business mix of bank i at time t .

DGR_{it} = Growth of deposits of bank i at time t .

DTA_{it} = Liquidity of bank i at time t .

DSN_{it} = Diversification of bank i at time t .

CON_t = Banking structure at time t .

INF_t = Inflation growth rate at time t .

GDP_t = Annual rate of change in GDP at time t .

ei = Error term

Where $t=2009-2013$, C_i = constant for each bank (*Random effect*), β = bank-specific factors coefficients, α = industry-specific factor coefficient, γ = macroeconomic factors coefficients.

Employment of linear probability models, in particular multiple linear regression method, is supported by the fact that dependents variables are characterise by continuous changes. The study applied Random-effect (RE) model in entire regression analysis and this model was used because it gives better probability values (*p.values*) which are the most efficient estimator (Li, 2007).

3.2 Data:

The paper analysed determinants of bank profitability in Zimbabwe after the adoption of multiple-currency system. The study covered from 2009-2013 and analysed a panel of eight (8) commercial banks. Panel data was sourced from audited financial statements, Deposit Protection Board (DPB) and RBZ publications.

3.3 Variables Selection:

Data generated from financial statements and DPB was used to model bank-specific and industry specific variables and RBZ publications were used to generate macroeconomic variables. Table 1 shows list of variables and their coding in the model as well as expected correlations.

Variable	Formula/Description	Hypothesized relationship with profitability
<i>DEPENDENT VARIABLES</i>		
Return on assets (ROA)	Net income/total assets	N/A
Return on equity (ROE)	Net profit before tax/shareholders' equity	N/A
Net interest margin (NIM)	Net interest income/total loans and advances	N/A
<i>INDEPENDENT VARIABLES</i>		
BANK-SPECIFIC VARIABLES		
Operating expenses management (OEM)	Total operational costs/ total assets	-
Bank size (SIZE)	Ln total assets	+/-
Off-balance sheet activities (OBA)	Non-interest income/total assets	+
Capital adequacy (ETA)	Total equity/total assets	+
Liquidity (DTA)	Total deposits/total assets	+
Liquidity risk (LTD)	Total loans/total deposits	+/-

Bank growth (DGR)	[(Current year/previous year)-1]	+
Managerial efficiency (MEF)	Operating expenses/operating income	+
Diversification (DSN)	Net interest income/total operating income	+/-
INDUSTRY SPECIFIC VARIABLE		
Industry concentration (CON)	Three largest banks' assets/total industry assets	+/-
MACROECONOMIC VARIABLES		
Real GDP growth rate (GDP)	Yearly changes in GDP growth rate	+/-
Inflation growth rate (INF)	Yearly changes in inflation rate	+/-

Source: Author's compilation.

3.3.1 Dependent variables:

Three dependent variables were incorporated in this study and these are return on assets (ROA), return on equity (ROE) and net interest margin (NIM). Multiple dependent variables were considered to develop an intricate understanding on how each of them is affected, in terms of *direction and significance*, by a set of explanatory variables.

3.3.1.1 Return on assets (ROA):

The ratio reflects bank's earnings ability and is calculated by dividing net income by total assets. Return on assets explains the relationship between generated net income and bank assets by indicating profit earned per dollar of assets (Javaid, 2011). The ratio reflects the efficiency of bank's management in using their assets to generate profit (Dzingirai and Katuka, 2014). Higher ratio infer greater efficiency in converting bank assets into net income and low ratios signal less efficiency by banks in converting assets into net income. (Athanasoglou, Brissimis and Delis ,2005). and Li (2007) incorporated ROA variable in their previous studies. However (Athanasoglou, Brissimis and Delis ,2005). explained that ROA may be a biased indicator due to its failure to capture off-balance sheet activities and to resolve this problem, the study captured off-balance sheet activities separately.

3.3.1.2 Return on equity (ROE):

ROE is the ratio of net profit before tax to shareholders' equity and is an indication of value added to invested equity capital. Ayele (2012) stated that ROE measures net income per dollar of equity capital. Higher ROE means higher net income per invested dollar of equity capital and low ratio communicates low net income per dollar of equity capital.

3.3.1.3 Net interest margin (NIM):

NIM is calculated by dividing net interest income by total loans and advances. There are variations to the denominator in various studies. Ayele (2012) used total loans and advances and conversely Naceur (2003) used total assets. Net interest margin is determined by management's experience in assets and liabilities management. Effective assets and liabilities management results in banks earning more income on assets as well as low interest costs on its liabilities which will ultimately raise profitability. This signifies that banks are likely to earn high NIM not only when they are earning favourable interests on assets but also when they keep depressing interest costs on their liabilities.

3.3.2 Independent variables:

Regression analysis computed both internal and external explanatory variables.

3.3.2.1 Bank-specific variables:

Analysis on endogenous determinants incorporated liquidity ratios, bank growth, operating expense management, off-balance sheet activities, size, managerial efficiency, capital strength and diversification indicators.

3.3.2.1.1 Liquidity:

There are two liquidity measures in the model namely, loans-to-deposits (LTD) ratio and deposits-to-assets ratio (DTA). DTA and LTD eke out each other in comprehensively explaining influence of bank liquidity on performance.

3.3.2.1.1.1 Loans-to-deposits (LTD):

The ratio of loans to deposits measures bank's resilience to liquidity risk. Bank liquidity is of essence in ensuring that the be-all and end-all goal of profit maximization is achieved. Loans form part of bank assets and deposits are part of bank liabilities thus the ratio is a measurement of bank's ability to effectively accommodate deposit redemptions as and when they come due (Dzingirai and Katuka, 2014). Strong bank liquidity pre-empt bank runs and panics in the economy. Higher LTD ratio infer that the bank is more liquid and less vulnerable to a classic run (Li, 2007). The researcher expect positive correlation between LTD and all profitability measures and such association implies that a rise in LTD brings about a rise in profitability.

3.3.2.1.1.2 Deposits-to-assets (DTA):

This ratio measures both bank liquidity status and customers and investors confidence in the bank. Deposits are primary stable source of bank liquidity and a higher ratio imply that the bank is more liquid. High volumes of deposits will increase bank profitability (Jabbar, 2014). Increase in bank deposits allows banks to meet customers' liquidity needs as well as creating an opportunity to effectively operate in financial markets. The researcher expects positive relationship between DTA and all performance measures. Positive correlation imply that an increase in DTA ratio will bring about a positive shift in profitability measures and also rise in investor confidence.

3.3.2.2 Capital strength (ETA):

Bank capital acts as a safety net and reflects bank's ability to engross losses during contingent events. The ratio of equity to assets proxy for bank capital adequacy which indicates banks' safety and soundness. Signalling and bankruptcy costs hypotheses assume a positive relationship between capital ratios and profitability, thus the study anticipate a positive correlation between capital ratios and performance measures.

3.3.2.3 Size (Size):

Bank size is measured by the natural logarithm of bank total assets. This variable will capture existence of economies of scale or diseconomies of scale among banks in the models. The bedrock assumption is that large banks are more profitable than small banks due to their ability to diversify and reduce risk. Increase in bank size is expected to be accompanied by rise in profitability but if size become extremely big, it could bring negative effects on bank performance (Athanasoglou, Brissimis and Delis ,2005).

3.3.2.4 Diversification and business mix:

There are two diversification measures in the model which are off-balance sheet activities (OBA) and diversification (DSN).

3.3.2.4.1 Off-balance sheet activities (OBA):

The ratio is calculated by dividing non-interest income by total assets. There is proliferation of banks' engagement into off-balance sheet activities and non-interest income comes in the form of commission and fees, foreign exchange profits and proceeds from sale of investment securities. This ratio is a measure of diversification and business mix (Sufian, 2011; Krakah and Ameyaw (2010). Krakah and Ameyaw (2010) found a positive correlation between off-balance sheet activities and bank performance thus this study expects positive connection.

3.3.2.4.2 Diversification (DSN):

This ratio uses total operating income as the denominator as opposed to total assets. Liu and Wilson (2009) were uncertain on the expected sign but this study assume a positive relationship. Positive correlation imply that the better diversified the bank is, the higher the profitability.

3.3.2.5 Deposits growth rate (DGR):

Deposits growth rate is calculated by dividing current year's deposits by previous year's deposits minus one. Expected sign is uncertain due to variety of reasons. Dietrich (2009) indicated that effect of deposits on performance depends on bank's ability to convert them into income. If deposits are extended as good loans, they could positively influence profitability. If they are extended as bad loans, they could bring negative effects on performance (Jabbar, 2014).

3.3.2.6 Efficiency:

Two efficiency measures were computed in the model and these are operating expenses management (OEM) and managerial efficiency (MEF).

3.3.2.6.1 Operating expenses management (OEM):

OEM variable is the ratio of operating expenses to total assets. Efficient operating expenses management reduces bank's cost structure and hence improve bank profitability. A higher ratio imply inefficient operating expenses management and deteriorates bank profits. In contrary, low ratio indicates effective operating expenses management which will ultimately be translated into higher profits. This being so, the study will assume a negative relationship between OEM variable and profitability measures.

3.3.2.6.2 Managerial efficiency (MEF):

Banks are managed by humans thus managerial efficiency is of chief importance in ensure success of banking institutions. The proxy for managerial efficiency is the ratio of operating expenses to operating income. Highly efficient management brings positive contributions to profitability, thus high efficient ratio is expected to accentuate profitability and this supports the efficiency structure hypothesis. Ayele (2012) found a positive relationship between efficiency ratio and profitability thus this study will anticipate a positive relationship. Positive link means that high managerial efficiency lead to positive shift in bank profitability.

3.3.2.2 Industry-specific variable:

Internal factors alone are inadequate to explain determinants of bank profitability thus the study also incorporated the impact of the banking industry as a system. The study computed one industry specific variable.

3.3.2.2.1 Industry concentration (CON):

Structure of the banking industry, in terms of concentration, affect banks' performance as individual entities. Banking structure and concentration communicates competition intensity in the banking industry and this was captured by calculating the ratio of three largest banks' assets to the total assets of the entire banking industry (Dietrich *et al*, 2009; Sufian, 2011; Naceur, 2003). SCP maintains that banks in highly concentrated markets tend to collude and generate above-normal profits, thus this hypothesis suggest a positive relationship between concentration and profitability. However Boone and Weignand (2000) indicated that if high concentration is a result of tougher competition in the banking industry, there would be a negative association between the two. In this regard the researcher is uncertain on the expected association between banking industry concentration and bank profitability.

3.3.2.3 Macroeconomic variables:

Banks do not operate in an isolate tower but rather in an economy where cyclical fluctuations and general price movements affect their profitability. To capture effects of the macroeconomic environment on banks' performance, the study incorporated annual rate of change in GDP growth (GDP) and rates of change in annual inflation (INF).

3.3.2.3.1 GDP growth (GDP):

This variable was computed by capturing yearly changes in GDP. If GDP improves, demand for credit increases which imply expansion in bank lending (interest *income*) and hence higher profitability thus leading to a positive association. However the researcher also expects negative association between GDP and bank profitability (Liu and Wilson, 2009). These authors explained that increases in GDP may improve business environment and lower barriers to entry which will ultimately dampen banks' profitability.

3.3.2.3.2 Inflation growth (INF):

Swings in inflation rate impacts banks as individual firms and the banking industry in broad. If banks anticipates a rise in the rate of inflation, they will hedge against this by incorporating expected inflation changes in their interest rates and in this instance they earn higher profits. If inflation rise was unexpected by banks, this will negatively impact their performance thus the researcher expects either positive or negative association between the two.

3.4 Diagnostic Tests:

3.4.1 Multicollinearity Test:

Multicollinearity test was performed by constructing a correlation matrix and variables with higher correlation coefficients were eliminated in the models. Cooper & Schindler (2009) suggested elimination of correlation coefficients above 0.8.

4. RESULTS AND DISCUSSION

4.1 Descriptive Statistics:

Table 1 presents descriptive statistics relating to both dependant and independent variables that were used in the regression analysis.

Table 1: Descriptive statistics-Dependent and explanatory variables (2009-2013)

Dependent Variables	Obs	Mean	Std. Dev	Min	Max
ROA	40	.032	.064	-.043	.334
ROE	40	.197	.199	-.255	.553
NIM	40	.103	.040	.0322	.253
Independent Variables	Obs	Mean	Std. Dev	Min	Max
LTD	40	.633	.218	.166	.964
DTA	40	.79	.083	.59	.913
MEF	40	1.03	.864	.565	6.05
ETA	40	.133	.039	.079	.254
OEM	40	.111	.036	.047	.186
OBA	40	.084	.032	.026	.182
DGR	40	.823	1.22	-.064	4.943
SIZE	40	19.4	.782	17.5	21.68
DSN	40	.494	.419	.065	1.91
CON	40	.344	.020	.318	.375
INF	40	.007	.045	-.077	.049
GDP	40	.073	.039	.018	.119

Source: Stata Output

Results indicates that, on average, banks' mean value for ROA, ROE and NIM were 0.032, 0.197 and 0.103 respectively. ROE has the highest mean value of 0.197 and a range of 0.808. This implies that bank net profit before tax represents 0.197% of shareholders equity in Zimbabwe. The study reported that, among dependent variables, ROA has the lowest mean value of 0.032 which implies that banks, on average, are earning US\$0.032 net income per US\$1 of total assets which is an unsatisfactory return. The lowest ROA was -0.043 and a maximum value of 0.334. Among explanatory variables, size had the highest mean value of 19.4 which indicates that banks have an average asset base of \$266,264,304. DGR showed highest standard deviation implying greater variability in deposits growth among banks. INF variables shows lowest mean value of 0.007 which indicates that the average inflation rate that was experienced was 0.007%.

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concentration negatively associate with ROA and this contradicts the Structure-Conduct-Hypothesis which suggest that banks in highly concentrated markets tend to collude and earn monopoly profits. Concentration variable is significant at 10% level and negative association imply that high concentration in the banking industry reduces ROA. Results are similar to those found by Naceur (2003) and Dietrich and Wanzenried (2009).

Inflation variable positively influence ROA in and the variable is significant at 5% implying a strong effect. Results conformed to Sufian (2011), Li (2007), and Alexiou and Sofoklis (2009). Findings suggest that increase in inflation is beneficial and that banks were anticipating changes in inflation such that they managed to capture such an effect in their interest rates. According to study findings, GDP negatively relates to ROA and the variable is significant at 10%. Similar findings were drawn by Liu and Wilson (2009) and according to these researchers negative association between ROA and GDP growth imply that high economic growth improves business environment and lowers bank entry barriers which increases competition and ultimately dampening bank profitability (ROA). Also negative correlation is emanating from simultaneous rise in aggregate loan and advances level and non-performing loans which at the end nullified benefits (*interest income*) embodied by increase in aggregate loans and advances.

Regression results are shown in Table 4 and the model is significant at 1%. Size, concentration, inflation, managerial, efficiency, gdp and deposits growth rate variables were insignificant and if we expand equation 2 by considering significant variables in Table 4, our prediction model look as follows:

$$ROE_{it} = 0.104 + 0.353LTD_{it} + 1.954ETA_{it} - 4.246OEM_{it} + 0.208DSN_{it} + 0.838DTA_{it} + 4.992OBA_{it} \dots \dots \dots Equation 5$$

Table 4 and Equation 5 indicates that ROE is entirely driven by bank-specific determinants hence all external factors have no impact on ROE in Zimbabwe. Both liquidity variables are positive as expected. Liquidity variables LTD and DTA are significant at 1% and 10% respectively. Based on these results, banks with higher LTD and DTA ratios have a stable source of funding and this increases their participation in financial markets which will in turn improves their ROE. Higher liquidity position induces customer and investor confidence, as portrayed by positivity of DTA variable, and this will finally increase bank ROE. Also according to these findings, banks with high LTD and DTA ratio are more likely mitigated against liquidity and reputational risk.

Findings also supported signalling and expected bankruptcy cost hypotheses with suggest a positive relationship between capital ratios and profitability. Sufian (2011) and Li (2007) found a positive relationship between capital ratios and profitability. In this study capital adequacy variable (ETA) is positive and significant at 1%. Positive correlation communicates that banks with higher capital holdings are more profitable since they are perceived safe by stakeholders. Better capitalised banks are able enough to engross losses in times of crises such as the later 2004 Zimbabwean financial crisis and the 2007 -2008 hyperinflation crisis.

Table 4: Regression Analysis (ROE))

Independent Variables	Random-effect Model (ROE) coefficients	P. Values
Ltd	0.3526138	(0.000)
Eta	1.954247	(0.005)
Oem	-4.245993	(0.000)
Size	-0.0411394	
Con	-1.015355	
Inf	0.550233	
Mef	-0.0061532	
Dsn	0.2078295	(0.001)
Dta	0.8379251	(0.014)
Gdp	0.7137379	
Oba	4.992182	(0.000)
Dgr	-0.0079882	
Constant	0.1039326	
Prob > chi2	= 0.0000	

Source: Stata Results

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Both diversification indicators (DSN) and (OBA) were positive and significant at 1% and this infers that bank diversification into non-interest income strongly improves its ROE. Regression results on operating expenses management (OEM) are similar to those in ROA regression. According to table 4, effective operating expenses management improves bank ROE and this evident the holding of (ES) hypothesis in Zimbabwean banking industry. The efficiency measure is significant at 1% indicating that banks' approach to operating expenses management plays a linchpin role in enhancing their profitability.

Tables 5 shows regression results between NIM and explanatory variables and findings indicated that bank profitability is solely determined by bank-specific factors as both industry and macroeconomic factors were insignificant in the model. The model was significant at 10% and if we develop equation 3, the prediction model will be as follows:

$$NIM_{it} = -0.03 + 0.057LTD_{it} + 0.689ETA_{it} + 0.367OEM_{it} - 0.019SIZE_{it} + 0.325DTA_{it} \dots \dots \dots \text{Equation 6}$$

Bank liquidity is key to improving net-interest margin. LTD and DTA are significant at 10% and 1% respectively. Results imply that banks that are more liquid are more likely to report high net-interest margin. Analysis also supported the signalling and expected bankruptcy cost hypotheses as the ratio of equity-to-assets is positive and significant in the model. Capital ratio is significant at 1% thus banks operating in Zimbabwe must ensure that their capital holdings are adequate enough to survive any contingencies.

Table 5: Regression Results (NIM)

Independent Variables	Random-effect Model (NIM)	coefficients	p. values
ltd		0.0569066	(0.034)
Eta		0.6887625	(0.001)
Oem		0.3664202	(0.088)
Size		-0.0193553	(0.060)
Con		0.312452	
Inf		0.00814	
Mef		-0.0047123	
Dsn		0.0288877	
Dta		0.3250176	(0.001)
Gdp		-0.2658704	
Oba		-0.0804493	
Dgr		-0.0080783	
constant		-0.030375	
Prob > chi2	=	0.0027	

Source: Stata Results

Size proxy is statistically significant at 10% and negatively correlate with NIM. Inverse relationship showed that growth in bank size negatively affects their profitability. Negative connection might be due to lack of massive revenues to cover up branch costs. Naceur (2003), Naceur and Goaid (2006) found negative relationship between NIM and bank size in Tunisia. Proliferation in using mobile money transfer services, provided by telecommunication companies, invalidated the need for banks to establish new branches as bank customers can now transfer their salaries from bank accounts to their mobile wallets and this reduces revenue that banks would have accrued through withdrawal charges. Operating expenses variable is positive and significant at 10%. According to Naceur and Goaid (2006) operating expenses management

variable that has an estimated coefficient of 0.37 suggest that 37% of a banks' operating costs are passed on its depositors and lenders which imply that banks that support high operating expenses operate with wider margins to compensate their high intermediation costs.

5. CONCLUSIONS

Research revealed that banking sector's profitability was volatile under the multiple-currency system and that there is greater variability in deposits among banks. Analysis indicated that ROA, ROE and NIM are differently affected by each of the explanatory variables. The study found out that ROE and NIM are solely influenced by bank specific factors. In contrary, ROA proved to be influences by a combination of both internal and external factors such as managerial efficiency, operating expenses management, inflation, industry concentration and GDP changes. Based on these findings, the researcher recommend banks to ensure they maintain low cost structures since efficiency had greater influence on all profitability measures.

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