An empirical study on the factors influencing the performance of financial institutions in Zimbabwe

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Abstract

The main aim of this study was to empirically assess the main micro economic factors that affect a bank's performance. The objectives were to ascertain if there is a relationship between the performance variables with the microeconomic variables, determine those that are statistically significant and their impact on the performance of banks in Zimbabwe. This study becomes unique in that it employs an econometric model which was built from balanced panel data and according to the author's knowledge, no study has so far employed the Arellano-Bond estimation procedure to Zimbabwean banks' data. The empirical analysis was carried out on a sample of 17 banks that were operational in the years 2010 to 2017 in Zimbabwe. Return on Assets (ROA), Return on Equity (ROE) and Net Interest Margin (NIM) were used as the performance indicators in the analysis, when most studies on Zimbabwean banks would focus on just one or two of these variables. The results indicate the main microeconomic factors to be those attributed to growth, credit risk, capitalisation, managerial efficiency, liquidity and diversification in the Zimbabwean financial institutions. Performance in these institutions is generally

good as measured by positive persistent profits, that is, ROA, ROE and NIM. These returns reflect the extent to which these institutions are resilient to the economic crisis. The nature of relationships within the micro economic variables can be explored for future research, as well as using the emerging machine learning techniques to better understand the relationships and critical points of the variables that have a significant impact on the performance of banks.

Keywords: ROA, ROE, NIM, Panel Data, Arellano-Bond Estimation

JEL classification: G21; C51; C32

Introduction

A bank's performance is a function of its strategic choices, strategy execution or quality of services and the environment it operates in (Harker and Zenios, 2000). Profitability is an important criterion to measure the performance of banks, especially in the changing environment of banking, hence this research used profit ratios to measure performance. Profitability is a prerequisite for banks' stability as it protects and builds up its own funds through the auto-financing process. During the economic crisis period of 2005-2009 in Zimbabwe, financial institutions had serious problems in mobilising funds and this had a negative effect on profit levels of these institutions. However, in an effort to solve this crisis and create economic resilience, the Reserve Bank of Zimbabwe (RBZ) put in place policies and strategies which included the adoption of the multi-currency system. It has since turned out that the regulation and supervision over the banking sector tends to be less effective in developing countries, partly due to their institutional weakness, capacity and resource constraints and problems with the political systems, as alluded by Mambondiani et al., (2013). This was evidenced by banks such as Interfin, AfrAsia, Renaissance, Merchant, Capital, Royal which shut down operations after the introduction of the multi-currency system. Zimbabwean banks have been facing serious liquidation and solvency problems, which has led to some banks closing down operations one after the other, after facing cash flow problems and failing to find new stakeholders. Unlike other states like Ecuador and Panama, which had economic recovery after dollarising their economies, Zimbabwe is still struggling to recover economically. The country lacks an affordable long term credit, as investors have weak confidence in the financial sector, the Central Bank and Government. Makina (2009), states that a stable political environment needs to be maintained to reduce country risk premium and to attract investment. Furthermore, the country has had low reserves before and after the dollarisation period. It has no short-term debt instruments, no bond market, has no sovereign ratings, and close to no international banks are acting as lenders of last resort and the financial markets lack depth. This has been a cause of concern for the investors under the Deposit Protection Corporation (DPC) who have since resorted to closely monitoring banks which show signs of financial distress. According to the JP Morgan Chase Bank (2017), very few investors are liable to trust risky investments, especially when taking into consideration that a financial boost is not a guarantee to provide a lasting solution to the problems at hand. While so many external factors affect the financial institutions directly and indirectly, this study assessed those factors that can be controlled internally by banks to improve on their performance levels. Given the crucial role that banks play in the economy of any country, it is very important to understand the factors that influence their survival. For any bank the main aim is to maximize profit generation and expand operations.

Globally, the banking industry has regained its health from the effects of the global financial crisis (EY Global Banking Outlook, 2018). The results of this banking outlook survey show that 85% of banks have implemented digital transformation programs as a business priority for 2018 and also invested in technology to drive efficiency and manage evolving risk. This has impacted positively on growth of the industry and has contributed positively to the performance of the banks. These results are also alluded by Price Waterhouse Coopers (2017) reports on the banking industry trends, where they highlight that the Fintechs startups (technology-based financial companies), have always been a competitive threat to traditional financial institutions but have since provided new opportunities as well. The report states that the financial services industry has been undergoing drastic technology changes over the past years and the speed has been projected to soon lead to banks that are truly global, multi-service, low-cost, digital where customers access

the banking services through applications designed by a artificial intelligence (AI) engine based on their savings and risk appetite profiles. The Indian banks have undergone digital transformation through immediate, enhanced mobile banking, unified payments interface, blockchain, artificial intelligence robots, fintech companies, digital-only banks, cloud banking, biometrics and wearables (North, Enterprise Edges Blog, accessed on 11/09/2019).

Discussions in this work are of great significance to financial institutions since the performance levels have been explained alongside the microeconomic factors driving these levels. Effective measures were recommended with an aim to improve banks' operations towards attaining better performance levels. The prescriptive models that were built in this study, equip decision makers in making adjustments towards better performing institutions. Since the poor performance of financial institutions have always led to the banks' failure in the past, which has had a negative effect on the growth and development of the financial sector, the sector is ever characterised and dominated by new players. The future of these new entrants is not certain as they also could have a short life cycle as the other failed banks. This work gave insight on how the life cycle of these financial institutions could be prolonged so that they contribute positively to the economy of our country moving towards accomplishing the Sustainable Development Goals.

The major contributions of this study are that this study used a good number of microeconomic factors, though not exhaustive, to assess their relationship with all the three measures of performance of Zimbabwean banks. A suitable estimation technique was also used, that allowed us to control the unobservable heterogeneity problem of individual banks, and the endogeneity problem of individual Zimbabwean banks, which is a consequence of unclear identification of causality in the model estimates.

The rest of the study will be organised as follows: the second section reviews literature on determinants affecting financial performance of banks, whilst the third section discusses the methods for analysis used. The fourth section presents empirical data and analysis whilst the fifth section discusses the results and the last section concludes the study and presents recommendations.

Literature Review

Several studies have been carried out in Zimbabwe in a bid to identify the relationship and determine the effect of microeconomic factors to the three performance variables in financial institutions.

Chinoda (2014), conducted a study on a sample of commercial banks, to investigate the determinants of profitability of commercial banks in Zimbabwe using a balanced panel data from 2009 to 2012. The author used ROA and ROE as the profitability measures and size, liquidity and expenses management as internal independent variables as well as inflation and GDP as external independent variables. The methodology used was simple regression analysis.

Katuka (2015) adopted the multiple linear regression technique to examine the effects of explanatory variables on ROA, ROE and NIM. The study aimed at identifying determinants of commercial banks' profitability in Zimbabwe since the inception of the multi-currency system, using data from 2009 to 2013.

Shiri et al. (2015) assessed the determinants of commercial bank profitability from prior- to post-hyperinflation in Zimbabwe, using a quantitative correlation approach. In their work on a sample of commercial banks, they were investigating the existence of relationships and impact of the liquidity risk, capitalisation and loans to deposit ratio on banks' profitability (profits before tax) from 2005 to 2012.

Abel and Roux (2016) established the determinants of the banking sector profitability in Zimbabwe during the period 2009 to 2014, on 18 banks. They used the fixed effects panel regression models to assess the quality of decision made by bank management (ROA, ROE) with regard to liquidity risk, credit risk, asset composition and management, expense management and capital size.

Financial performance encompasses returns (profits, return on assets, return on investment, etc.); product market performance (sales, market share, etc.); and shareholder return (total shareholder return, economic value added, etc.), (Richard et al., 2009). The most common measure of bank performance is profitability. Accounting profits are the difference between revenues and costs. Profitability is considered to be the most difficult attribute of a firm to conceptualize and to measure (Ross et al. 2005). Profitability ratios are generally

considered to be the basic bank financial ratios in order to evaluate how well bank is performing in terms of profit. These ratios indicate a firm's profitability after taking into account all expenses and income taxes, the efficiency of operations, firm pricing policies, profitability on assets and to shareholders of the firm (Van Horne and Wachowicz, 2009).

Return on Equity (ROE) calculated as net profit/total equity, shows how much profit a firm generated with respect to the total shareholder equity amount invested or found on the balance sheet. It indicates how much returns a firm got from its investments. It is the most important indicator of a bank's profitability and growth potential. ROE indicates the profitability to shareholders of the bank after all expenses and taxes (Van Horne and Wachowicz, 2009).

Return on Assets (ROA) calculated as net profit/total assets, is a ratio of the bank's income to the bank's total assets (Khravish, 2011). It measures the bank's ability to generate income using assets at its disposal. ROA indicates the profitability on the assets of the bank after all expenses and taxes (Van Horne and Wachowicz, 2009).

Net Interest Margin (NIM) calculated as net interest income/total assets, focuses on the profit earned on interest activities. NIM is a ratio that measures how successful a firm is at investing its funds in comparison to its expenses on the same investments.

NIM as the difference between income from loan interest generated by financial institutions and the amount of interest paid out to the bank's lenders, reflects the pure operational efficiency of a bank and the competitive nature of the two traditional banking markets: the credit and the deposits market. Marinkovic and Radovic (2014) reiterate that many authors researching on banking in transition, the NIM is often used to test the success of overall transition efforts. However, for banking industries that are more involved in non-traditional (fee-generating) activities, the NIM ceases to be a reliable indicator of overall bank profitability, and hence this study adopted the use of ROA and ROE as well to measure performance.

Hamadi and Awdeh (2012), analysed the determinants of commercial bank interest margins in Lebanon using bank-specific, industry-specific, monetary policy and macro-economic variables for the period 1996-2009. The results indicated that size, liquidity, efficiency, capitalization and credit risk have a negative impact on interest margins while growth rate of deposits, lending, inflation, central bank discount rate, national saving, domestic investment and to a lower degree, the interbank rate all have a positive impact on NIM.

Bustaman et al. (2017) conducted a study on the net interest margin, market power and diversification strategy on banking stability. The author used a random effect panel data regression model and the results obtained emphasized that the level of NIM is an important factor in determining the banking stability. The results also showed that market power, diversification of non-interest income as well as foreign bank penetration also are important for bank stability. According to the author, efficiency is also a variable that has positive effects on banking stability. Inefficient banks are run conservatively because they have limited margin and capital reserves and this constraints them from taking a higher level of business risk.

Hussain (2012) explored determinants of NIMs of commercial banks of Pakistan. He used cross sectional panel data analysis and a least squares regression model was built. Based on his results, past net interest margins, bank soundness, operating cost, industry concentration, relative market share, inflation, real depreciation and industrial growth have statistically significant and positive impact while diversification, change in bank size, lagged liquidity, stock market development have dampening effects on net interest margins. He also established that ownership, GDP and credit market development are statistically insignificant.

Akintoye and Beck (2009) demonstrated that the level of taxation, business risk, financial flexibility and managerial behavior should be considered in the analysis of corporate performance. Based on the idea of a trade-off between risk and expected returns, he considered these crucial factors in determining the optimal capital mix. This optimal proportion can be followed considering that it minimizes the cost of capital while maximizing the company value. Moreover any changes made in the level of debt or equity alters a firm's value.

Jain et al. (2019) used a random effect model to explore on the determinants of profitability of 45 Indian commercial banks. Private sector banks were found to perform better than the public sector banks. NPAs, profit per employee, operating profit to total assets and investment to total assets were found to have statistical significance on profitability.

Al-Homaidi et al. (2018; 2019) in both studies used the panel data approach to assess the determinants affecting profitability (ROA, ROE, NIM) in their 2018 paper and Liquidity on their 2019 paper, of Indian commercial banks. The same methodology was used on both papers (pooled, fixed, and random effects models as well as the GMM). Their results revealed that bank size, number of branches, asset management ratio and leverage ratio were highly significant in explaining profitability in terms of ROA, ROE and NIM. Bank size. Capital adequacy ratio, deposits ratio, operation efficiency ratio, ROA, assets quality ratio, assets management ratio, ROE ratio and the NIM ratio were highly significant in explaining Liquidity.

Abate and Mesfin (2019) explored on bank-specific, industry-specific and macroeconomic factor on the profitability of 9 commercial banks in Ethiopia. They used the random effect regression model on 2007 – 2016 data on Ethiopian banks. Capital adequacy, leverage and liquidity were found to be significant whereas bank size and number of branches were insignificant.

Boateng (2018; 2019) compared the determinants of bank profitability between the Indian and Ghanaian banks in his 2018 paper, and used the CAMELS ratings model framework to select factors to assess the performance of banks in Ghana in his 2019 paper. In both studies, multiple regression was used on both studies and it was found that both countries were affected by credit risk, net interest margin, capital adequacy ratio in the performance of their banks. Bank size and operating efficiency were highly significant for Ghanaian banks, in the 2018 paper. Earnings were highly significant in explaining performance of banks in Ghana in the 2019 paper whereas sensitivity was insignificant.

Hypothesis development based on literature findings. The literature above assisted in formulating the following hypothesis:

Hypothesis 1 (H₀): Microeconomic variables have no relationship with a banks' performance.

Hypothesis 2 (H₀): Microeconomic variables have no impact on a banks' performance.

These hypotheses were tested at a 5% level of confidence.

Methodology

The data used for analysis was extracted from annual balance sheets and income statements for 17 operational Zimbabwean banks, during the period 2010 to 2017, 8 of which were private indigenous, 6 were foreign and 3 were state-owned banks. The data used was a balanced panel dataset which described attributes of banks' operations over time. If for a reason, a bank leaves a sample (attrition), and the event is correlated with the idiosyncratic error (those unobserved factors that change over time and affect profits) then the resulting sample can cause biased estimators. The fixed effects estimation can be used if attrition is correlated with the unobserved effect (Wooldridge), though attrition bias also acts as a company specific effect and can be differenced out. The correlation significance can be tested using the Sargan statistic, and if significant then the empirical study on determinants of banks' performance can suffer from sources of inconsistency, highly persistent profit and endogeneity bias (Poghosyan and Hesse, 2009), hence we apply a dynamic panel data estimation approach which addresses these problems by employing the generalised method of moments (GMM), following the Arellano and Bond (1991) two-step difference-GMM and the Blundel and Bond (1998) system-GMM paradigm. Berger et al. (2006) also argue that bank profits show a tendency to persist over time, suggesting the use of a dynamic model on banking profitability.

Dynamic Panel Data Models

Panel data analysis is a method of studying a particular subject within multiple sites, periodically observed over a defined time frame. With repeated observations of enough cross sections, panel analysis permits the researcher to study the dynamics of change with short time series. The combination of time series with cross sections can enhance the quality and quantity of data in ways that would be impossible using only one of these two dimensions (Gujarati, 2003). A dynamic panel-data model has the form

$$y_{it} = \sum_{j=1}^p \alpha_j y_{i,t-j} + x_{it}\beta_1 + w_{it}\beta_2 + v_i + \epsilon_{it}, \text{ for } i = 1, \dots, n \text{ and } t = 1, \dots, T_i$$

where α_j are p parameters to be estimated,

x_{it} is a $1 \times k_1$ vector of strictly exogenous covariates, β_1 is a $k_1 \times 1$ vector of parameters to be estimated,

w_{it} is a $1 \times k_2$ vector of predetermined and endogenous covariates,

β_2 is a $k_2 \times 1$ vector of parameters to be estimated,

v_i are the panel-level effects (which may be correlated with the covariates), and

ϵ_{it} are i.i.d over the whole sample with variance σ_ϵ^2 .

The v_i and the ϵ_{it} are assumed to be independent for each i over all t. By construction, the lagged dependent variables are correlated with the unobserved panel-level effects, making standard estimators inconsistent. With many panels and few periods, estimators are constructed by first differencing to remove the panel-level effects and using instruments to form moment conditions. The lagged dependent variable removes any correlation. The dynamic panel approach accounts for the individual effects and allows dynamic effects to be introduced into the model. Panel data estimation captures bank specific effects that allow for heterogeneity (internal policies, managerial styles, attitude towards risk, etc) that remain invariant over time and are part of the random component (Arellano and Bover, 1995). It also deals with endogeneity problems when certain independent variables are affected by bank performance and allows for estimation of dynamic effects that would otherwise be not possible in cross sectional or time series analysis (Athanasoglou et al., 2008).

Panel Unit Root Tests

The panel unit root tests allow investigation into mean-reversion (stationarity) in the panel of series. Maddala and Wu (1999) suggest the use of the Fisher test as it performs best. The Fisher test deals with the cross-sectional independence. The null hypothesis of non-stationarity is rejected at the 5% level for all the variables, since all tests: P, Z, L and Pm tests have a p-value = .0000.

The Sargan Test

The Sargan-Hansen test is a statistical test used for testing over-identifying restrictions in a statistical model. It was proposed by John D. Sargan in 1958. Lars P. Hansen in 1982, reworked through the derivations and showed that it can be extended to general non-linear GMM in a time series context. The Sargan test is based on the assumption that the model parameters are identified via a priori restrictions on the coefficients and tests the validity of over-identifying restrictions. The test statistic can be computed from residuals of instrumental variables regression by constructing a quadratic form based on the cross-product of the residuals and exogenous variables. Under the null hypothesis that the over-identifying restrictions are valid, the statistic is asymptotically distributed as a χ^2 variable with $(m - k)$ degrees of freedom (where m is the number of instruments and k is the number of endogenous variables).

Instrumental variables methods rely on two assumptions:

the excluded instruments are distributed independently of the error process,

the excluded variables are sufficiently correlated with the included endogenous regressors.

The specification of an instrumental variables model asserts that the excluded instruments affect the dependent variable only indirectly, through their correlations with the included endogenous variables. If an

excluded instrument exerts both direct and indirect influences on the dependent variable, the exclusion restriction should be rejected.

To test the second assumption, it is necessary to consider the goodness of fit of the first stage regressions relating each of the endogenous regressors to the entire set of instruments. Sargan (1975) pointed out that, the testing of over-identifying assumptions is less important in longitudinal applications because realisations of time varying explanatory variables in different time periods are potential instruments, that is, over-identifying restrictions are automatically built into models estimated using longitudinal data. The Sargan test has a null hypothesis of "the instruments as a group are exogenous". Therefore, the higher the p-value of the Sargan statistic, the better.

Test for Autocorrelation

In the Arellano-Bond (AB) framework, the value of the independent variable in the previous period is a predictor for the current value of the dependent variable (Pinzon, 2015). When unobservable and observable components are correlated, there is an endogeneity problem that yields inconsistent parameter estimates if a conventional linear panel estimator is used. The solution is instrumental variables, the second lags of the dependent variable and all the feasible lags thereafter. According to Pinzon (2015), the key for the instrumental set in the AB framework to work is that $E(\Delta Y_{i(t-j)} \Delta \epsilon_{it}) = 0, j \geq 2$. We can test these conditions in Stata using `estatbond` (a command in STATA). The differenced unobserved time-invariant component should be unrelated to the second lag of the dependent variable and the lags thereafter. If this is not the case, we have a problem of endogeneity. All is well if

$$\Delta \epsilon_{it} = \Delta V_{it},$$

where $\Delta \epsilon_{it}$ is the differenced time-varying unobservable component and ΔV_{it} is the differenced time-invariant unobservable component. The unobservable component is serially correlated of order 1 but not serially correlated of orders 2 and beyond. There is also a problem if the second lag of the dependent variable is not related to the differenced time-varying component $\Delta \epsilon_{it}$, that is, $\Delta \epsilon_{it} = \Delta V_{it} + \Delta V_{i(t-1)}$. The differenced time varying unobserved component is then serially correlated with an order greater than 1.

The Arellano-Bond test for autocorrelation has a null hypothesis of no autocorrelation and is applied to the differenced residuals. The test for AR(1) process in the first differences usually rejects the null hypothesis since

$$\Delta \epsilon_{it} = \epsilon_{it} - \epsilon_{i,t-1} \text{ and } \Delta \epsilon_{i,t-1} = \epsilon_{i,t-1} - \epsilon_{i,t-2}$$

both have $\Delta \epsilon_{i,t-1}$. The test for AR(2) in the first differences is more important because it detects autocorrelation in levels.

According to Baum (2013), the residuals of the differenced equation should possess serial correlation, but if the assumption of serial independence in the original errors is warranted, the differenced residuals should not exhibit significant AR(2) behavior. If a significant AR(2) statistic is encountered, the second lags of endogenous variables will not be appropriate instruments for their current values.

Microeconomic Factors Selection

The selection of the main financial ratios for each company was conditioned by those variables that appeared most in empirical studies. The following variables were chosen according to literature on determinants influencing banks' profitability:

Market Share (MS) is the logarithm of the value of deposits. MS is a capital indicator which is expected to have a positive impact on profitability. Abreu and Mendes (2002) found out that well capitalised banks have lower expected bankruptcy costs and better profitability. Hoffman (2011) also argues that banks with great market share have an advantage of controlling prices of products in the market since they have monopoly powers and hence a large market share suggests higher profits.

Company Size (CS) is described by the accounting value of a bank's total assets. CS is represented by the natural logarithm of total assets. The effect of CS on profitability is generally expected to be positive (Alper and Anbar, 2011).

$$CS = \frac{\text{total assets}}{\text{overall total assets in all banks}}$$

Credit Risk (CR) has been proxied by the ratio of loan loss provision to total loans. This ratio reflects changes in the health of bank's loan portfolio that affects performance of the bank negatively (Aydogan, 1990 in Alper and Anbar, 2011). The higher the ratio, the poorer the quality and therefore the higher the risk of the loan portfolio. It is calculated as:

$$CR1 = \frac{\text{loan loss provision}}{\text{total loans}} \text{ and } CR2 = \frac{\text{net loans}}{\text{total assets}}$$

Taxation (Tax) is the ratio of tax to operating profits before tax. This ratio is expected to be negative as it entails the direct cost of a bank and hence it reduces profitability. Tax is a compulsory monetary contribution to the state's revenue, assessed and imposed by a government on the activities, enjoyment, expenditure, income, occupation, privilege, property, etc of all organizations. It is calculated as:

$$Tax = \frac{\text{tax}}{\text{operating profits before tax}}$$

Solvency Risk (SR) is the ratio of shareholder's equity to total assets and has been used as a capital indicator. It is expected that the higher this ratio, the lower the need for external funding and the higher the profitability of the bank. This shows the ability of a bank to absorb losses and handle risk exposure with shareholder. It is calculated as:

$$SR = \frac{\text{shareholder's equity}}{\text{total assets}}$$

Cost Efficiency (CE) is used in order to estimate how efficiently banks manage their expenses relative to their size. CE is an indicator of cost management efficiency since the operating expenses are an outcome of bank management. Efficient cost management usually leads to improved profitability of banks. It is calculated as:

$$CE1 = \frac{\text{operating expense}}{\text{total assets}} \text{ and } CE2 = \frac{\text{operating expense}}{\text{average assets}}$$

Diversification (Divers) is the product of manager's decisions to reduce risk. The importance of fee based services of banks is to increase the non interest income and so a positive relationship is expected between Divers and profitability. It is calculated as:

$$Divers = \frac{\text{non interest income}}{\text{gross revenue}}$$

Business Mix (BM) is the ratio of net income from fees and commission to average assets. This ratio is expected to be positive since it measures the capability of a bank to generate income through fees and commission from account maintenance. It is calculated as:

$$BM1 = \frac{\text{net income from fees and commission}}{\text{average assets}} \text{ and } BM2 = \frac{\text{net income from fees and commission}}{\text{total assets}}$$

Liquidity1 (Liq1) is expected to have a positive coefficient as high liquidity may allow a bank to avoid costly borrowing of funds. Insufficient liquidity is one of the major reasons of bank failures hence the interventions of the central bank in Zimbabwe (RBZ) in enforcing the Basel II instrument amid the volatile economic environment. It is calculated as:

$$Liq1 = \frac{\text{liquid assets}}{\text{average assets}}$$

Liquidity2 (Liq2) measures the percentage of total assets comprised by loans and we expect a positive coefficient as more loans generate interest income for the bank unless a bank takes on unacceptable levels of risk. It is calculated as:

$$Liq2 = \frac{\text{net loans}}{\text{total assets}}$$

Loan Funding Structure (LFS) is the ratio of granted loans to received deposits. The more deposits transformed into loans, the higher the interest margin and profit. This ratio is thus expected to have a positive effect on profitability. It is calculated as:

$$LFS = \frac{\text{granted loans}}{\text{received deposits}}$$

Foreign Exchange Risk Management Efficiency (FERME) is the ratio of income from net exchange rate differences to average assets. With the emergence of the alternative market in Zimbabwe, the banks now have minimal access to foreign currency and hence this ratio is expected to have negative impact to profitability. It is calculated as:

$$FERME = \frac{\text{income from net exchange rate difference}}{\text{average assets}}$$

Impact of Managerial Inefficiency (IMI) is the logarithms of overhead costs which is expected to have a negative impact on profitability.

Impact of the economic crisis (Crisis) is a control variable in the banking industry. It is calculated as:

$$Crisis = ROA + \frac{\text{equity} / \text{total assets}}{\sigma(ROA)}$$

It is often associated with a panic or a bank run where investors sell off assets or withdraw money from savings accounts because they fear that the value of those assets will drop if they remain in a financial institution and hence expected to negative.

Efficiency, calculated as: $Efficiency = \frac{\text{total operating expenses}}{\text{gross revenue}}$,

is a measure of a bank's ability to turn resources into revenue. It is better when the ratio is lower. An increase in the efficiency ratio indicates either increasing costs or decreasing revenues.

Bank Orientation (BO), is measured as a logarithm of the number of branches of a bank. Beck et al. (2005) states that banks with many branches will likely have a retail orientation thereby affecting the performance of such banks. However whether such an impact would be positive or negative is difficult to predict.

Ownership, is a dummy variable, which is described by D1 = 1 - government , 0 - private ;

D2 = 1 - foreign , 0 - local. The ownership structure affects the principal- agent relationships that influence profitability of banks. Impact could be positive (Westman, 2011).

Loan to Asset Ratio (LAR), demonstrates the ability of banks to meet the demand for loans by using total assets owned by banks. The credit performance level is better with a higher LAR ratio because of the greater loan component given in the total structure of the assets (Rivai et al., 2007). It is calculated as:

$$LAR = \frac{\text{total gross loans}}{\text{total assets}}$$

Cost of reserve requirements (Reserve) is the opportunity cost of keeping such reserves. It is a control variable and is expected to have a negative impact. It is calculated as:

$$Reserve = \frac{\text{non interest income}}{\text{total assets}}$$

Bank concentration (Conc) reflects on the banks that have been involved in mergers and acquisitions as part of their growth strategies. It is calculated as:

$$Conc = MS^2$$

which is a quadratic form of MS used to study the non-linear relationship between the capital ratio and bank's profitability (Saona, 2016).

Relative bank size (RBS), calculated as

$$RBS = \frac{\text{total assets}}{\text{overall total assets in all banks}} \times 100 \text{ measures growth.}$$

Empirical Data and Analysis

The empirical research employed annual data over the multi currency era, from 2010 to 2017 for a total of 17 operational Zimbabwean banks' published balance sheets and income statements. Ratios were generated in Excel and a balanced panel dataset of the generated microeconomic factors was imported to STATA where the analysis was done.

Summary Statistics

The dataset was checked if it was balanced by summarising it according to years and according to the bank IDs. The ID table has frequencies of banks for the entire time period under study, where ID numbers were allocated to banks and the numbers of entries were summed for each bank. As shown in Table 1, all IDs have the same number of observations meaning the data used is balanced. The year table, Table 2, is showing frequencies of banks for each year. Each year has 17 frequencies also showing the data used is balanced data.

Table 1: ID table

ID	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
No. of Obs	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8

Table 2: Year table

Year	2010	2011	2012	2013	2014	2015	2016	2017
No. of Obs	17	17	17	17	17	17	17	17

Descriptive statistics

Descriptive statistics were generated and presented in Table 3. The number of observations available in the total sample is the same for all variables implying that the data is balanced. The average asset related profit for Zimbabwean banks is 5% as shown by the mean value of ROA, which implies that on average, banks are earning US\$0.05 net income per US\$1 of total assets which is an unsatisfactory return. The difference between the minimum and the maximum value of ROA shows there is a very small difference in profitability within Zimbabwean banks. The mean profit for Zimbabwean banks in terms of ROE is 13%, which implies that Zimbabwean banks earn US\$0.13 per US\$1 of equity capital. The range is larger as compared to ROA, to show that there are different varying net incomes per US\$1 of equity capital generated by different banks. The mean profit for Zimbabwean banks in terms of NIMs is about 10%, which implies that banks realise US\$0.10 for every US\$1 loaned out. The negative minimum values of ROA, ROE and NIM indicate that some banks are not profitable. Furthermore, there are very small standard deviations signaling that there are no outliers. The data had no zeros (null) except for FERME (some banks were not active in foreign exchange dealings and hence some entries were zeros), whilst D1 and D2 has responses which were zeros.

Table 3: Descriptive Statistics

	val	null	na	min	max	range	Median	mean	SE	CI	var	std.dev	coef.var
MS	136	0	0	15.51	21.27	5.75	19.04	18.86	0.1	0.19	1.28	1.13	0.06
Conc	136	0	0	240.68	452.26	211.58	362.41	356.95	3.62	7.16	1781.96	42.21	0.12
ROA	136	0	0	-0.29	0.23	0.52	0.05	0.05	0	0.01	0	0.06	1.17
ROE	136	0	0	-6.16	0.77	6.94	0.2	0.13	0.05	0.11	0.4	0.63	4.75
NIM	136	0	0	-0.02	0.21	0.23	0.07	0.08	0	0.01	0	0.03	0.43
CS	136	0	0	16.22	21.38	5.16	18.98	18.94	0.09	0.17	1.02	1.01	0.05
CR	136	5	0	-0.21	0.25	0.45	0.01	0.02	0	0.01	0	0.04	2.33
SR	136	0	0	-0.08	1.04	1.12	0.19	0.25	0.02	0.03	0.03	0.18	0.74
CE	136	0	0	0.06	0.64	0.58	0.19	0.22	0.01	0.02	0.01	0.12	0.54
Divers	136	0	0	-0.08	0.86	0.94	0.46	0.47	0.02	0.03	0.04	0.19	0.4
BM	136	0	0	0.01	0.66	0.65	0.1	0.13	0.01	0.02	0.01	0.11	0.84
BM2	136	0	0	0.01	0.33	0.32	0.08	0.1	0.01	0.01	0	0.07	0.67
Liq1	136	0	0	0.16	1.89	1.73	0.94	0.96	0.02	0.05	0.07	0.27	0.28
Liq2	136	0	0	0.15	0.98	0.82	0.84	0.8	0.01	0.02	0.02	0.14	0.18
CR2	136	0	0	0.14	0.93	0.79	0.69	0.67	0.01	0.03	0.03	0.16	0.24

LFS	136	0	0	0.19	2.35	2.16	0.72	0.77	0.03	0.06	0.11	0.34	0.44
CE2	136	0	0	0.06	1.28	1.22	0.21	0.28	0.02	0.04	0.04	0.21	0.77
Efficiency	136	0	0	0.11	3.72	3.6	0.79	0.85	0.04	0.08	0.21	0.46	0.54
FERME	136	72	0	0	0.2	0.2	0	0.01	0	0	0	0.03	3.69
IMI	136	0	0	15.33	18.72	3.39	17.36	17.28	0.06	0.13	0.57	0.75	0.04
D1	136	113	0	0	1	1	0	0.17	0.03	0.06	0.14	0.38	2.22
D2	136	79	0	0	1	1	0	0.42	0.04	0.08	0.25	0.5	1.18
Reserve	136	0	0	-0.01	0.34	0.35	0.1	0.12	0.01	0.01	0.01	0.08	0.64
Crisis	136	0	0	-0.42	42.73	43.15	5.88	7.58	0.48	0.95	31.45	5.61	0.74
BO	136	0	0	1.39	4.17	2.79	2.94	2.9	0.06	0.12	0.49	0.7	0.24
RBS	136	0	0	0.19	30.93	30.74	4.05	5.88	0.53	1.06	38.91	6.24	1.06

The range of all values is generally small, which shows that the data is free from outliers. The values for standard error (SE), confidence interval (CI), variance (var) and standard deviation (std.dev) are considerable small, which shows the data is consistent and the measures of the micro economic factors across all banks are uniform, showing similar characteristics from the same industry. Zimbabwean banks are thriving to respect the international regulation of Basel II. Capitalisation differs among banks but it is represented by significant amounts which have minimal differences as seen on the small ranges. Credit risk ratio stands at 2% on average which is very small signaling the good and improved credit risk management being employed by banks.

Correlation Analysis

Examination of correlation coefficients allows us to study the null hypothesis of no correlation between the explanatory variables. Using the paper by Kennedy (1985), we shall also consider 0.8 as the limit value of the correlation coefficient to confirm the null hypothesis. If the correlation between the two variables exceeds 0.8 then the null hypothesis is rejected and it is not possible to hold the two variables in the same model.

Table 4: Correlation matrix1

	MS	Conc	ROA	ROE	NIM	CS	CR	Tax	SR	CE	Divers	BM	BM2	Liq1
MS	1													
Conc	1	1												
ROA	0.09	0.1	1											
ROE	0.29	0.3	0.34	1										
NIM	-0.01	-0.01	0.63	0.1	1									
CS	0.94	0.94	0.01	0.31	-0.17	1								
CR	0.08	0.08	-0.11	-0.12	0.05	0.03	1							
Tax	-0.04	-0.04	-0.14	-0.02	-0.1	-0.01	-0.01	1						
SR	-0.68	-0.67	0.13	-0.03	0.04	-0.62	0.16	-0.06	1					
CE	-0.48	-0.48	-0.11	-0.25	0.19	-0.65	0.05	-0.01	0.32	1				
Divers	-0.35	-0.35	0.17	-0.02	-0.13	-0.42	0.03	-0.06	0.49	0.54	1			
BM	-0.51	-0.5	0.18	-0.07	0.04	-0.6	-0.02	-0.01	0.44	0.74	0.63	1		
BM2	-0.51	-0.5	0.24	-0.06	0.16	-0.62	-0.01	0.01	0.45	0.78	0.72	0.89	1	
Liq1	0.06	0.06	-0.02	-0.03	0.04	-0.03	0.17	-0.1	-0.15	0.07	-0.06	0.2	-0.05	1
Liq2	0.40	0.4	0.12	0.12	0.3	0.3	0.38	-0.06	-0.25	-0.23	-0.27	-0.31	-0.23	0.46
CR2	0.06	0.05	-0.01	-0.06	0.35	-0.02	0.17	-0.01	-0.21	0.1	-0.27	-0.08	-0.07	0.4
LFS	-0.38	-0.38	-0.24	-0.11	-0.15	-0.14	0.13	0.05	0.27	-0.12	-0.11	-0.08	-0.12	0.06
CE2	-0.46	-0.45	-0.18	-0.21	0.03	-0.60	0.01	-0.02	0.28	0.88	0.46	0.79	0.63	0.36
Efficiency	-0.21	-0.22	-0.48	-0.25	-0.13	-0.26	0.11	0.04	0.18	0.49	0.15	0.19	0.16	-0.04
FERME	0.06	0.06	0.06	-0.09	0.11	-0.03	-0.03	-0.14	-0.03	0.16	0.18	-0.03	-0.09	0.10
IMI	0.90	0.90	-0.01	0.24	-0.02	0.86	0.10	-0.01	-0.59	-0.21	-0.18	-0.32	-0.30	-0.01
D1	-0.01	0.01	-0.10	-0.02	-0.12	0.10	0.04	-0.08	-0.01	0.09	0.13	0.17	0.19	0.10
D2	0.43	0.42	0.07	-0.01	0.14	0.28	-0.01	-0.14	-0.31	-0.02	-0.08	-0.18	-0.20	0.05
LAR	0.01	-0.01	-0.03	-0.10	0.34	-0.08	0.25	0.00	-0.15	0.12	-0.23	-0.06	-0.05	0.38
Reserve	-0.51	-0.51	0.28	-0.09	0.16	-0.62	0.03	-0.05	0.54	0.77	0.82	0.82	0.90	-0.05
Crisis	-0.44	-0.44	0.10	0.05	0.06	-0.50	0.08	-0.10	0.63	0.38	0.51	0.44	0.38	0.26
BO	0.49	0.49	0.06	0.20	-0.01	0.47	0.09	0.12	-0.19	-0.03	0.03	0.04	0.10	-0.08
RBS	0.69	0.71	-0.02	0.18	-0.19	0.75	0.01	-0.09	-0.45	-0.44	-0.38	-0.33	-0.44	0.21

Table 5: Correlation matrix2

	Liq2	CR2	LFS	CE2	Efficiency	FERME	IMI	D1	D2	LAR	Reserve	Crisis	BO	RBS
Liq2	1													
CR2	0.52	1												
LFS	0.05	0.39	1											
CE2	-	0.07	-	1										
Efficiency	0.28	-	0.09	-	1									
FERME	-	0.05	-	0.23	0.11	1								
IMI	0.10	0.08	0.17	-	-0.01	0.07	1							
D1	0.29	0.01	0.31	0.09	-0.06	-0.02	0.14	1						
D2	0.12	0.21	-	-	0.06	0.22	0.35	-	1					
LAR	0.49	0.95	0.40	0.08	-0.04	0.05	0.03	0.01	0.16	1				
Reserve	-	-	-	0.65	0.12	0.17	-	0.17	-	-	1			
Crisis	0.28	0.11	0.11	0.32	0.03	-	0.32	-	0.16	0.09	-	1		
BO	0.11	0.06	0.03	0.47	0.15	0.23	0.40	0.02	0.09	0.03	0.51	-	1	
RBS	0.09	0.02	-	-	-0.13	0.02	0.57	0.38	0.05	-	0.03	-0.19	0.03	1
	0.21	0.10	0.08	0.08	-	0.00	0.62	0.30	0.10	0.02	-0.43	-0.33	0.51	1
			0.04	0.30	-0.25									

The following pairs of variables were not put in the same model so as to eradicate multicollinearity:

IMI – CS; IMI – MS; MS – Conc; IMI – Conc; CS – Conc; CE2 – CE; Reserve – Divers;

BM - BM2; BM - Reserve and CR2 - LAR. This then solved the problem of multicollinearity.

Unit Root Tests

We then proceeded to test for the stationarity of the panel using the unit root test for the balanced panels.

Table 6: Fisher-type Unit root tests

Variable	Inverse χ^2, P	Inverse Normal, Z	Inverse Logit, L*	Modified Inverse χ^2, P_m
MS ₋₁	63.20 (0.00)	-2.32 (0.01)	-2.32 (0.08)	3.54 (0.00)
Conc ₋₁	52.45 (0.01)	-1.92 (0.03)	-1.91 (0.03)	2.72 (0.00)
CS	98.59 (0.00)	-4.49 (0.00)	-5.44 (0.00)	7.83 (0.00)
CR	86.16 (0.00)	-4.68 (0.00)	-5.12 (0.00)	6.32 (0.00)
Tax	61.54 (0.00)	-3.83 (0.00)	-3.81 (0.00)	3.38 (0.00)
SR	98.70 (0.00)	-4.68 (0.00)	-5.55 (0.00)	7.85 (0.00)
CE	155.07 (0.00)	-5.38 (0.00)	-8.58 (0.00)	14.68 (0.00)
Diverse	108.16 (0.00)	-2.63 (0.00)	-4.80 (0.00)	8.99 (0.00)
BM	746.65 (0.00)	-22.08 (0.00)	-49.67 (0.00)	86.42 (0.00)
BM2	149.13 (0.00)	-4.15 (0.00)	-7.99 (0.00)	13.96 (0.00)
Liq1	460.78 (0.00)	-15.34 (0.00)	-30.71 (0.00)	51.76 (0.00)
Liq2	99.77 (0.00)	-3.67 (0.00)	-5.00 (0.00)	7.98 (0.00)
CR2 ₋₁	127.42 (0.00)	-6.70 (0.00)	-7.94 (0.00)	11.33 (0.00)
LFS ₋₁	214.11 (0.00)	-7.60 (0.00)	-13.13 (0.00)	21.84 (0.00)
CE2	815.79 (0.00)	-24.46 (0.00)	-54.69 (0.00)	94.81 (0.00)
Efficiency	103.92 (0.00)	-5.85 (0.00)	-6.37 (0.00)	8.48 (0.00)
FERME	205.06 (0.00)	-8.98 (0.00)	-16.85 (0.00)	20.74 (0.00)
IMI	103.44 (0.00)	-3.33 (0.00)	-4.80 (0.00)	8.42 (0.00)
D1 ₋₁	9.43 (1.00)	-2.37 (0.01)	-2.77 (0.01)	-2.98 (0.99)
D2 ₋₁	9.43 (1.00)	-2.37 (0.01)	-2.77 (0.01)	-2.98 (0.99)
LAR ₋₁	113.39 (0.00)	-5.83 (0.00)	-6.84 (0.00)	9.63 (0.00)
Reserve	125.52 (0.00)	-3.22 (0.00)	-6.55 (0.00)	11.1 (0.00)
Crisis	412.11 (0.00)	-15.02 (0.00)	-27.40 (0.00)	45.85 (0.00)
BO	97.51 (0.00)	-1.55 (0.06)	-4.64 (0.00)	7.70 (0.00)
RBS	86.10 (0.00)	-1.89 (0.03)	-2.91 (0.00)	6.08 (0.00)

The original dataset had some factors containing a unit root and hence not stationary. A unit root is some stochastic process that can cause a problem in statistical inference involving time series models. The factors, MS, Conc, CR2, LFS, D1, D2 and LAR were differenced once and were seen to be stationary after differencing. The new variables to be used in our model are MS-1, Conc-1, CR2-1, LFS-1, D1-1, D2-1 and LAR-1. Choi (2001) suggested that the inverse normal Z statistic offers the best trade-off between sample size and power and hence it outperforms the other tests and is recommended. Under this basis, factors D1-1, D2-1 are stationary.

Dynamic Panel-data Estimation for ROA, ROE and NIM

We then proceeded to estimate the three models using either the Arellano-Bond (1991) two-step difference-GMM approach or the Blundel and Bond (1998) two-step system-GMM approach.

ROA estimation

The System dynamic panel-data estimation had better statistical results for ROA (lag 5), as indicated by the Wald test statistic, which rejects the null hypothesis of joint insignificance of parameters. The Sargan test also rejects the null hypothesis to confirm the validity of the instruments. Lengthening the lags in the model eliminated serial correlation in the error term, and hence the Arellano-Bond autocorrelation test was not done in this case. Again, with the system GMM, the error term does not have second order autocorrelation, otherwise the standard error of the instrument estimates grow without bound (Doytch and Uctum, 2011).

Table 7: System dynamic ROA model

ROA	Coefficient	Standard Error	z	P > z
ROA _{L1}	0.6309	0.2026	3.1100	0.0020
ROA _{L2}	0.3830	0.1313	2.9200	0.0040
ROA _{L3}	0.0713	0.0869	0.8200	0.4130
ROA _{L4}	-0.1924	0.1580	-1.2200	0.2230
ROA _{L5}	0.2278	0.1017	2.2400	0.0250
CR	-0.1693	0.1562	-1.0800	0.2780
Tax	-0.0165	0.0116	-1.4200	0.1560
Liq1	-0.2120	0.0712	-2.9800	0.0030
Liq2	0.2054	0.0956	2.1500	0.0320
CR2 ₋₁	-0.2695	0.2178	-1.2400	0.2160
LFS ₋₁	0.0889	0.0287	3.1000	0.0020
Efficiency	-0.0600	0.0234	-2.5700	0.0100
FERME	-1.3552	1.3658	-0.9900	0.3210
IMI	0.0337	0.0206	1.6400	0.1010
D1 ₋₁	-0.0719	0.1207	-0.6000	0.5510
LAR ₋₁	0.1486	0.2065	0.7200	0.4720
Reserve	-0.3833	0.1495	-2.5600	0.0100
Crisis	0.0091	0.0021	4.4200	0.0000
BO	-0.0134	0.0589	-0.2300	0.8200
RBS	-0.0103	0.0040	-2.6300	0.0090
Conc ₋₁	0.0018	0.0006	3.0900	0.0020
Cons.	-0.4465	0.4411	-1.0100	0.3110
Wald chisq. (16)			327.71	0.000
Sargan Test chisq. (26)			6.1942	0.7203

The 1st, 2nd and 5th lagged ROA are highly significant which confirms the dynamic character of bank profits measured by returns on assets. The coefficients 0.63, 0.38 and 0.22 respectively, indicate a decline in persistence of profits for a particular year with reference to preceding years. The higher the value of the coefficient of the lag, the greater is the departure of the bank from the perfect competitive market(s). This then shows that Zimbabwean banks deviate moderately from competitive markets and they are then left with a considerable degree of competition. On the statistically significant microeconomic factors, only Conc, IMI ($\alpha = 0.10$), Liq2, LFS, and Crisis contribute positively to returns on assets. On the other hand, Efficiency, Liq1, Reserve and RBS are statistically significant and these variables lower the value of the returns on assets.

From Table 7, it can be concluded that the magnitude and significance of the coefficient on the lagged ROA confirms the dynamic nature of the model and shows a moderate persistence in ROA.

ROE estimation

The ROE model was estimated using the Arellano-Bond difference-GMM estimation, where the Wald test, Sargan test and the Arellano-Bond test statistics confirmed that it fits the panel data well.

Table 8: Arellano-Bond dynamic ROE model

ROE	Coefficient	Robust Std. Err.	z	P > z
ROE_{L1}	-0.7144	0.3087	-2.3100	0.0210
CR	-47.3530	18.9085	-2.5000	0.0120
Tax	-0.1940	0.0977	-1.9900	0.0470
Liq1	4.3769	2.0178	2.1700	0.0300
Liq2	-23.8016	9.8534	-2.4200	0.0160
CR2 ₋₁	-1.0316	6.4131	-0.1600	0.8720
LFS ₋₁	1.1039	0.5120	2.1600	0.0310
Efficiency	2.5697	1.1905	2.1600	0.0310
MS ₋₁	1.2644	0.5779	2.1900	0.0290
LAR ₋₁	-4.4344	7.8768	-0.5600	0.5730
Reserve	40.3507	21.1347	1.9100	0.0560
Crisis	-0.0940	0.0658	-1.4300	0.1530
BO	4.3376	1.8987	2.2800	0.0220
RBS	-0.6354	0.2218	-2.8600	0.0040
CS	4.7299	1.7029	2.7800	0.0050
Cons.	-89.0765	34.5322	-2.5800	0.010
Wald chisq. (16)			2128.7600	0.000
Sargan Test chisq. (26)			1.37e ¹⁷	1.0000
Arellano-Bond test				
Order 1			-1.2332	0.2175
Order 2			-1.2275	0.2196

The coefficient of the lagged ROE is -0.7144 and statistically significant which shows that past performance has an inverse mild persistence effect on the microeconomic factors. With the ROE model, factors with statistically significant coefficients and contribute positively towards ROE are MS, CS, Efficiency, Liq1, Reserve, and BO. Factors which are statistically significant and contribute negatively to ROE are Tax, CR, CR2, Liq2, and RBS.

NIM estimation

The NIM model was constructed using the System dynamic panel-data estimation, which gave the best model as shown by the Wald, Sargan and Arellano-Bond tests' statistics.

Table 9: System dynamic NIM model

NIM	Coef.	Robust Std. Err.	z	P > z
NIM_{L1}	11.7974	4.1926	2.8100	0.0050
CR	-6.3517	2.2900	-2.7700	0.0060
Tax	-0.0013	0.0023	-0.5900	0.5580
Liq1	-1.6247	0.5816	-2.7900	0.0050
Liq2	3.2068	1.1379	2.8200	0.0050
CR2 ₋₁	-1.2345	0.4490	-2.7500	0.0060
LFS ₋₁	0.4369	0.1594	2.7400	0.0060
Efficiency	0.2272	0.0851	2.6700	0.0080

Conc -1	0.0160	0.0058	2.7500	0.0060
Divers	1.0837	0.4011	2.7000	0.0070
Crisis	-0.0181	0.0067	-2.7100	0.0070
BO	-0.2584	0.1000	-2.5800	0.0100
RBS	0.1061	0.0386	2.7500	0.0060
CS	-0.4143	0.1462	-2.8400	0.0050
CE	0.6170	0.1842	3.35	0.0010
D1-1	0.1127	0.0555	2.0300	0.042
Cons.	5.3514	1.8744	2.8600	0.0040
Wald chisq. (16)			3337.2100	0.000
Sargan Test chisq. (26)			1.26e ¹⁵	1.0000
Arellano-Bond test				
Order 1			-0.5023	0.6154
Order 2			-0.3368	0.7362

The results show that the estimated coefficient (11.7974) for the lagged NIM is highly positive and statistically significant at the 5% level of significance. This implies that the non-interest income has been persistent throughout the period under study. This confirms the results found by Mutenheri and Matinha (2017), who found a positive coefficient for the lagged NIM for the 2011 to 2014 time period. The statistically significant factors that contributed positively to NIM, in this case were Conc-1, CE, Efficiency, Divers, Liq2, LFS-1, D1-1, and RBS. The negative and statistically significant factors were CS, CR, CR2-1, Liq1, BO, and Crisis.

The ROA, ROE and NIM models developed in this work are good models and have reliable coefficients, as confirmed by the validation tests that were also carried out.

Discussion

The factors found to be significant to explaining the profitability of Zimbabwean banks were classified according to capitalisation, growth, credit risk, cost management, business mix, liquidity, Loan funding structure and ownership on each of the ROA, ROE and NIM models.

Factors MS-1 and Conc-1, which are synonymous to each other showed a positive relationship to the performance measures, as expected, contrary to Katuka (2015). This result confirms the Structure-Conduct Hypothesis which suggests that banks in highly concentrated markets tend to collude and earn monopoly profits. Katuka (2015) articulates that better capitalised banks are able to engross losses in times of crisis such as the 2004 Zimbabwean financial crisis and the 2007-2008 hyperinflation crisis. Again higher capital holdings are perceived safe by stakeholders and thus more profitable. MS-1 was positively related to ROE, as expected. This result is supported by the bankruptcy-costs argument. Whenever bankruptcy costs are expected to increase, the banks increase their capital ratio, as management signals to the market or shareholders on its capacity to generate profits. Conc-1 is positively related to ROA and NIM giving a U-shape relationship supported by Lind and Mehlum (2010), which means that there exists a non-linear relationship between the market share and (ROA and NIM). This implies that the more deposits decreases ROA up to 0.2% and also decreases NIM up to 0.6% (their respective p-values). Beyond these thresholds (optimal points), capital infusion increases ROA and NIM, (Saona and Azad, 2018). These optimal values and coefficients are small reflecting on low capitalisation of Zimbabwean banks.

The variable BO had a positive impact on ROE (as expected) and a negative impact on NIM. The inverse relationship between BO and NIM reflect the inefficiency of management of Zimbabwean retail banks with many branches to distribute costs, compared to banks with few branches. The variable Crisis had a positive impact on ROA and a negative impact on NIM (as expected). The direct relationship of Crisis with ROA shows that Zimbabwean banks' performance drops during economic contractions. Generally, these variables explaining the capitalisation of banks should be managed so as to counteract their negative shocks towards banks' performance, so that banks' are highly capitalised to absorb shock during times of economic distress.

The variable CS had its coefficient positive for ROE, as expected, which means that the bigger the company translates to more shareholders' equity, and the higher the profits. This concurs with findings by Khrawish (2011). CS had a negative coefficient in the NIM model which was also found by Athanasoglou et al. (2008) and Aburime (2008), who then drew inference that the bigger the company, the more the shareholders, and hence the more the bureaucratic bottlenecks and managers are incapacitated to invest in different assets and that may bring down NIM. This shows that Zimbabwean banks should aim at revenue enhancement measures for sustainable pro table growth. On the other hand, the variable RBS had negative impacts on ROA and ROE and a positive impact on NIM (as expected). The inverse relationship between RBS and profitability reflects on the instability of banks within the banking industry. This may be attributed to the low capitalisation of banks which makes is a cumbersome task to absorb shocks during times of distress. The variable Tax had a negative impact only on ROE, as expected. This result concurs with a research by Abdullah et al. (2014), who pointed out that a negative relationship between taxation and profitability could emanate from the fact that the more taxes paid by the bank, the higher the costs incurred by the bank hence a decrease in returns. As it only brings down ROE, this shows that Zimbabwean banks pay their taxes from their equity funds where an increase in tax rates is effected on equity. Reserve is considered as tax on bank operating activities hence it is expected to have a negative impact as it has on ROA. Its positive impact on ROE indicates that customers pay higher prices than competitive prices in accessing banking products, as the costs of reserves increase. Zimbabwean banks seem to be struggling on growth because of the taxes which they pass on to customers and customers are ever migrating from one bank to the other (customer churn).

The variable CR and CR2, measuring credit risk had negative coefficients in the ROE and NIM models, as expected. This result concurs with what other authors pointed out, that higher credit risk has a negative impact on ROE and NIM (Ommeren, 2011; Flamini et al., 2009 and Athanasoglou et al., 2008). This could be because of the high proportion of non-performing loans which decrease the income, and equity. When loans are non-performing, interest income is not realised and when its is calculated at the time of collection, it requires additional provision. This then implies that, non-performing loans lead to no interest income, but rather provision expense is estimated on the uncollected amount. For CR2, there is still a moderate level of risk on loans, which bank managers should aim to continue minimising in their investment portfolios. Due to efforts for growth, Zimbabwean banks offer loans to attract new customers as well as to retain old customers and forego the good practice of proper credit risk management. Most Zimbabwean banks are characterised by lack of credit risk transparency, ineffective loan decision processes, use of inefficient risk measurement methodologies, lack of stress testing and poor credit risk reporting.

The factors CE, and Efficiency had a positive impact on ROE and NIM, consistent with prior empirical evidence (Aburime, 2008; Athanasoglou et al., 2008 and Berger, 1995). This could be best explained by the fact that if there are efficient cost management systems in banks then profits will be realised. If banks' expenses are efficient managed, by reducing the cost of operations, this will in turn improve the performance of the banks. As stated by the Efficiency Structure hypothesis, an efficiently managed bank will earn higher profits than the less efficient ones. Thus, reducing the cost of operations in turn reduces the incidence of failure of the banks and hence strengthens the confidence of the shareholders and the public.

The variable Efficiency had a negative impact on ROA. This result is in line with Chinoda (2014), who suggested that banks may be failing to pass on all their operating expenses to customers, maybe due to high competition or lack of market power in the banking industry.

The factor IMI, had a positive effect only on ROA. Inefficiency of management has proved to have a direct effect on returns. This result is consistent with the findings on Cost Management Efficiency as it suggests that the management have practices though not proper, which bring higher returns to the institutions.

The factor Divers, was the only significant factor and has a positive impact on the NIM model. This indicates that Zimbabwean banks rely more on non-traditional banking activities for profitability, which are related to revenue diversification (interests, fees, commissions, etc) rather than those related to asset diversification (security trading, hedge funds, foreign exchange, assurance, etc). This result also confirms the Harry Markovitz Modern Portfolio theory which implies that the more diversified a bank is, the more profitable it is (Mutenheri and Matinha, 2017).

The factor Liq1, measuring the liquidity of these institutions, had negative impacts on ROA and NIM but a positive impact on ROE as expected. Liq2 had a positive impact on ROA and NIM as expected but a negative impact on ROE. Katuka (2015) suggested that banks with high liquidity ratios have a stable source of funding and this increases their participation in financial markets and interest generating activities, which in turn improves their profits, as seen in the relationship of Liq2 and (ROA and NIM). They also gain customer and

investor confidence, which increases ROE as portrayed by the relationship of Liq1 with ROE. The decrease in returns due to liquidity crisis in Zimbabwe is also centered on poor export and import performance of the economy as well as lack of depositor confidence which has led to hoarding of cash by the public resulting in cash circulating outside the banking system and thus, reducing the liquidity of the financial system. Nhavira et al. (2013) have also pointed out that a number of institutions operating in Zimbabwe have externalised the US\$ in offshore accounts for speculative purposes of the return of the Zimbabwean dollar or bond notes.

The factor LFS, had a positive impact on ROA and NIM. This could be coming from higher interest rates earned from loans and minimal interest paid to deposits, where the excess is then transferred to the credit portfolio which is of higher risk and higher returns.

D1 had a positive impact on NIM, as expected. Westman (2011) also concurred with this result by highlighting that management ownership has a positive impact on profitability in non-traditional banks, where operations are difficult to monitor due to complexity of products and greater opacity. The government-owned banks thrive mainly because the government injects capital towards non-traditional activities which generates income and hence a higher NIM. Micco et al. (2007) state that government-owned banks in developing countries have a low level of profitability and a high level of costs compared to private-owned banks. The difference between performance of government and private banks increases during election years due to an increase in the supply of loans by government-owned banks.

Conclusion

This study has unveiled the microeconomic factors that have a relationship with performance measures and those that do not have such a relationship, within the operations of Zimbabwean banks. Factors such as solvency risk, business mix, foreign exchange risk management efficiency, foreign-ownership and loan-asset ratio were found to be statistically insignificant and hence had no role to play in determining the level of banks' performance in Zimbabwe. The weak liquidity power which was revealed in this study, could be solved by local banks merging with foreign banks so as to access funds off shore. The remaining microeconomic factors were found to be related to the performance measures and had generally mild to moderate impact on the banks' performance in Zimbabwe. From the above discussions, the RBZ is still encouraged to continue enforcing measures and supervision tools, other than the only short term monetary policy instruments, as the most effective way to ensure a convergence of the best practices in the local banking industry towards the international benchmarks. It was also unearthed that most significant factors which impacted on profitability were based on managerial skills and the banking environment, which calls for measures to be taken so as to enforce good corporate governance since investors perceive well-governed institutions as less risky and have a higher firm valuation. Strengthening the performance of banks through good corporate governance will empower banks to be again functional and influential agents in resuscitating the Zimbabwean economic growth and sustainable development. The banks' management can now be alert and focus more on the factors that directly influence the performance of banks, taking into consideration their different levels of impact they have on profitability.

The hypothesis that stated that the microeconomic factors have no relationship with a bank's performance was rejected, as a significant number of relationships between the microeconomic factors and profitability were established. These factors also had a significant impact on profitability, allowing for the hypothesis that stated that the microeconomic factors had no impact on the bank's performance, to be rejected as well.

These microeconomic factors are interlinked and do not contribute towards profitability individually but rather collectively and hence further studies could classify these factors and determine other non linear relationships, and hence expand the financial and economical theory formulations that coexist to explain these factors. Patterns using machine learning techniques may also be derived so as to explain these relationships as well as determine the optimal threshold or critical points of these factors. This study however, did not take into consideration the macro economical determinants and these can be included in further research. Unity and compliance of statistical and economic significance on the determinants of banks' profitability is achieved as well as consistency with some aforementioned empirical research.

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