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The Determinants of Commercial Bank Profitability in Zimbabwe: A Dynamic Panel Data Model

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Abstract
This study examined profitability of 15 commercial banks in Zimbabwe that survived the economic crisis experienced in Zimbabwe from 2003 to 2008. The first objective of the study was to determine whether the profitability of these banks significantly changed over the post crisis period. Using annual financial accounts data, from 2011 to 2014, the results from the one-way repeated measures ANOVA show that the mean profit ratios significantly changed over the four year period. The second objective was to determine factors influencing bank profitability under a multicurrency regime and the results from a dynamic panel data model show that diversification, funding cost and market share significantly affected profitability of commercial banks in Zimbabwe during the period under study.
Keywords: bank profitability, dynamic panel data, diversification, funding cost, market share.

1. Introduction

It is generally agreed that the banking sector plays a significant economic role in any country. An efficient and profitable banking sector promotes transfer of funds from saving units to investing units (Hoffman, 2011) and this positively impacts the GDP growth of a country (Sufian and Habibullah, 2009 and Owoputi,*et al,* 2014). Furthermore, a profitable banking sector contributes to the stability of the financial system (Alper and Anbar, 2011; Ani *et al*, 2012 and Perera *et al*, 2013).

However, it is well known that economic and financial crises adversely affect operations of banks. Interestingly, the banks that survive these economic and financial crises may take a long time to get back to their pre-crises profitability levels. These banks may also take other measures to recovery. In this context, it is interesting to examine how profitability levels of banks change over time as these banks come out of the crises. In addition, it is also interesting to determine whether the well known factors influencing bank profitability are relevant to banks that have gone through a crisis. This study, therefore, examines these issues using Zimbabwe as a case study.

During the economic crisis period of 2005-2009 in Zimbabwe, financial institutions had serious problems in mobilizing funds and this had a negative effect on profit levels of banks. However, in an effort to solve the economic crisis, Zimbabwe adopted the use of multiple currencies such as the United States Dollar, British Sterling, Euro and the South African in February 2009. This move boosted business activities and banks started to realize profits. In this context, it is therefore interesting to know whether profitability of Zimbabwean commercial banks significantly increased over the period 2009 to 2014 and whether the determinants of bank profitability proposed in the literature still hold for banks that have survived economic crisis.
The main objectives of the current study are therefore:

(a) To assess whether commercial bank profitability in Zimbabwe has significantly changed over the period 2011-2014.
(b) To identify bank specific factors that affect profitability of commercial banks in Zimbabwe.

2. Literature Review

The empirical literature has identified the major bank specific determinants as liquidity, credit risk, bank size, bank efficiency, funding costs, funding structure, ownership structure, bank growth, bank diversification and the bank's market share.

Bank liquidity

It is generally known that liquidity problems can lead to bank failure and thus suggesting a positive relationship between bank liquidity and profitability. However, high liquidity implies that more liquid funds are tied up in liquid investments and this suggests that there is a negative relationship between liquidity and profitability (Athanasoglou *et al*, and Davydenko, 2010). In terms of empirical evidence, Curak *et al* (2012) and Schipper (2013) found a positive relationship between profitability and liquidity. However, the empirical study by Alexiou and Sofoklis (2009) has found a negative relationship between profitability and liquidity, whilst, studies by Ommeren (2011) and Bektas (2014) did not find any significant relationship between profitability and liquidity. Therefore, the relationship between liquidity and profitability is not clear.

Capital Adequacy

Capital is amount of own fund available to support the bank's business and act as a buffer when faced with severe risks. Therefore the capital adequacy ratio is directly proportional to the resilience of the bank to crisis

situations (Ongore and Kusa, 2013). Empirical literature is mixed regarding the effects of capital adequacy on bank profitability. The risk-return hypothesis suggests that a higher capital adequacy implies a lower expected return (Ommeren, 2011).However, contrary to the risk-return hypothesis; the bankruptcy cost hypothesis suggests a positive relationship between capital adequacy and profitability due to lower costs of financial distress. Therefore it is not clear whether capital adequacy positively or negatively influence profitability. Even the empirical literature does not provide a clear picture on the relationship between capital adequacy and profitability. For example, Schipper (2013) and Bektas (2014) found a positive relationship between profitability and capital adequacy, while Curat *et al* (2012) and Hoffman (2011) found a negative relationship.

Credit Risk

Credit risk is one of the proxies for asset quality in banks. Since lending is the core business for commercial banks credit risk is inevitable. However, an increase in credit risk increases the probability of bank failure (Alexiou and Sofoklis (2009). Thus credit risk is postulated to be inversely related to bank profitability and several empirical studies have reported a negative relationship between credit risk and bank profitability (Ommeren, 2011; Davydenko, 2010; Alexiou and Sofoklis, 2009 and Trujillo-Ponce, 2012).

Bank Size

Large banks are predicted to be more profitable than small banks through economies of scale and low costs of raising capital (Davydenko, 2010). However extremely large bank may have low profits because they become too complex to manage resulting in diseconomies of scale due to agency costs and extensive bureaucratic structures (Ommeren, 2011). This might suggest a non-linear relationship between bank size and profitability. Research by Alexiou and Sofoklis (2009) and Schipper (2013) found a positive relationship between bank size and bank profitability and Hoffmann (2011) reported a non-linear relationship between profitability and bank size.

Efficiency

Cost minimization increases profits therefore a bank is defined as being run efficiently by properly managing its costs. Empirical studies comparing pre-crisis with either during-crisis or post-crisis periods have commonly found a non-linear relationship between bank profitability and efficiency (Schipper, 2013 and Curak *et al*, 2012). This implies that higher costs results in less profits therefore banks must focus on minimising expenses to increase profits.

Funding Costs

Schipper (2013) argues that banks that raise income at low costs have very high chances of increasing their profits and the empirical evidence supports this view. For example, Lindblom *et al*. (2010), Dietrich and Wanzenried (2011) and Schipper (2013) all have reported a negative relationship between funding costs and bank profitability. However, the empirical evidence by Ommeren (2011) and Curak *et al* (2012) did not find a relationship between funding costs and bank profitability.

Ownership Structure

Banks are usually classified as privately, internationally or government owned. Azam and Siddiqui (2012) examined bank profitability of domestic and foreign banks in Pakistani and reported that foreign owned banks are more profitable than their domestic counterparts since these foreign owned banks less affected by macroeconomic variables due to their multinational bank system. On the other hand, in Ukraine, foreign owned banks were found to have lower profits than the domestic banks (Davydenko, 2010). However, studies by Dietrich and Wanzeried (2011) and Bektas (2014) did not find evidence of a significant difference in profitability of foreign and domestic banks.

Funding Structure

The ratio of customer deposits to total deposits is usually used as proxy for the funding structure of a bank and it is postulated that a bank becomes more stable and liquid by having more customer deposits since customer deposits are less expensive than investment deposits (Schipper, 2013). This cheap and stable financial source of funding structure is likely to increase bank profitability. Unavailability of cheap customer deposits may force banks to borrow from international markets in the form of credit lines which has a negative effect on profitability of banks (Trujillo-Ponce, 2011 and Schipper, 2013).

Diversification

Harry Markowitz Modern Portfolio theory (MPT) argues that diversification increases risk-adjusted profitability and reduce bank insolvency risk (Wolfe and Sanya, 2011). This implies that the more diversified a bank is, the more profitable it is. Although studies by Dietrich and Wanzenried (2011) and Ommeren (2011), suggest that there is a positive relationship between bank profitability and diversification, Barros *et al* (2007) argue that diversification within a bank does not necessarily mean improvement in bank profitability. Nassreddine *et al* (2013) did not find evidence of a relationship between diversification bank profitability for banks in Tunisia.

Growth

The proxy for growth of banks is generally annual growth of loans. It is hypothesized that high growth rate implies increased new business to the bank and this is more likely to increase bank profits (Davydenko, 2010).

However, growth in loans would also indicate the risk appetite of a bank in lending and therefore might lead to high-risk lending in a bid to maximize returns and thus suggesting a negative relationship between growth and bank profitability.

Market Share

Banks seek to grow and gain market share (Nassredine *et al*, 2013). Banks with great market share have an advantage of controlling prices of products in the market since they have monopoly powers. Thus large market share suggests higher profits (Hoffman, 2011 and Kutsienyo, 2011). Empirical evidence shows that there is a positive and significant relationship between bank profitability and market share (Bhatti, 2010; Davydenko, 2010 and Bektas, 2014). However, a study by Hoffmann (2011) found a negative relationship between market share and bank profitability.

3. Data and Method

This study utilized annual data from 15 commercial banks operating in Zimbabwe over the period 2011-2014. The empirical literature has proved that bank profitability has a tendency to persist over time (Hoffmann, 2011 and Perera, Skully and Chaudhry, 2013) and in order to capture this profit persistence over time, this study estimated the following empirical dynamic panel data model using the Arellano-Bover/Blundell-Bond estimator;

$$NIM_{it} = \beta_0 + \beta_1 NIM_{it-1} + \beta_2 DIV_{it} + \beta_3 CAD_{it} + \beta_4 LIQ_{it} + \beta_5 CRR_{it} + \beta_6 EFF_{it} + \beta_7 GRW_{it} + \beta_8 FCT_{it} + \beta_9 FST_{it} + \beta_{10} GRN_{it} + \beta_{11} MSZ_{it} + \beta_{12} SZE_{it} + \beta_{13} OST_{it} + \mu_{it}$$

Where:

NIM = net interest margin (a measure of profit)

DIV = diversification; CAD = capital adequacy; LIQ = liquidity; CRR= credit risk;

EFF = efficiency; GRW= growth; FCT = funding cost; FST= funding structure; GRN = gearing; MSZ= market size; SZE= bank size; OST= ownership structure

i represents individual banks where i=1,.....15

t represents time where t=1,.....4

$\mu_{it} = v_i + \varepsilon_{it}$

$\mu_{it} = disturbance\ term$

$v_i = unobserved\ bank - specific\ effect$

$\varepsilon_{it} = idiosyncratic\ error$

$\beta_0 - \beta_{13}\ are\ coefficients\ to\ be\ estimated$

Variables

Dependent variable: Although many empirical studies have used return on capital, return on equity and net interest margin as alternative measures of profitability in a single study (see,Athanasoglou, Delio and Slaikouras, 2006; Davydenko, 2011), this study used net interest margin only as a measure of bank profitability. The main reason behind the use of net interest margin as a measure of bank profitability is that it incorporates non-interest income which is now considered to be an important source of revenue for commercial banks (Hassan and Bashir, 2003).

Independent variables: The independent variables considered in this study were diversification, capital adequacy, liquidity, credit risk, efficiency, growth, funding cost, funding structure, gearing; market size, bank size, and ownership structure. Definitions of these variables and their expected signs are shown in Table 1 below

Table 1: Definition of variables and expected signs

Definition	Expected Sign	Variable	Reference
net interest income$/total\ assets$	N/A	Net Interest Margin	Acaravci and Calim (2013) Nassreddine et al (2013)
$\frac{Non-interest\ income}{Gross\ revenue}$	+	Diversification	Ommeren (2011) Dietrich and Wanzenried (2011) Nassreddine et al (2013)
$\frac{Equity}{Total\ Assets}$	+/-	Capital Adequacy	Kutsienyo (2011) Ommeren (2011)
$\frac{Total\ Loans}{Total\ Assets}$	+	Liquidity	Naceur and Omran (2010)
$\frac{Total\ Loans}{Customer\ deposits + short\ term\ funding}$	+/-	Liquidity	Ommeren (2011)
$\frac{Loan\ Loss\ Provision}{Interest\ income}$	-	Asset Quality/Credit Risk	Ommeren (2011)
$\frac{Operating\ Cost}{Total\ Income}$	-	Efficiency	Liu and Wilson (2010) Ommeren (2011)
$\frac{Interest\ Expense\ on\ deposits}{Total\ Deposits}$	-	Funding Cost	Dietrich and Wanzenried (2011)
$\frac{Customer\ Deposits}{Total\ Deposits}$	+	Funding Structure	Trujillo-Ponce (2011)
$\frac{Loans\ at\ end\ of\ year - Loans\ at\ beginning\ of\ year}{Gross\ Loans\ at\ beginning\ of\ year}$	+	Growth	Dietrich and Wanzenried (2011) Ommeren (2011)
$\frac{Total\ Deposits}{Industry\ average\ deposits}$	+	Market Share	Liu and Wilson (2010)
Natural Log (ln) of Total Assets	+/-	Size	Curak et al (2012) Trujillo-Ponce (2011) Hoffman (2011)

4. Results and Discussion

The profitability ratios of commercial banks in Zimbabwe over the period 2011-2014 are shown in Table 2. These results show that the highest bank profits were recorded in 2012 (M = 10.79 %, SD =3.55) while the lowest profits were realised in 2014 (M = 7.73%, SD = 3.45). Table 2: NIM ratios for commercial banks for the period 2011-2014

Table 2. Profitability of Commercial banks in Zimbabwe

	Year			
Statistic	2011	2012	2013	2014
Mean	8.89%	10.79%	10.20%	7.73%
Std. dev	5.79	3.55	4.07	3.45

To test for a significant difference in mean profitability ratios over the four year period, a one-way repeated measure ANOVA was used. The results of the one-way repeated measures ANOVA (Table 3) show that the mean bank profit significantly changed over the four years, $F(3,40) = 3.15$, $p = 0.0352$.

Table 3: Results of the One-Way Repeated-Measures ANOVA

Source	ms	df	F-value	P-value
Overall model	32.68	17	2.93	0.0026
Firm	31.30	14	2.80	0.0054
Time	35.22	3	3.15	0.0352
Error	11.17	40		

In order to determine the factors associated with bank profitability, a GMM two-step system estimator model was estimated and the results (not reported) suggested that capital adequacy, liquidity, efficiency, growth, funding structure, gearing, bank size, and ownership structure were not significantly associated with profitability of commercial banks in Zimbabwe during the period 2011to 2014 and were dropped from the model. The model was re-estimated with diversification, credit risk, funding cost and market share as the only potential determinants of bank profitability and the results are presented in Table 4 below. The results from the Sargan test ($\chi^2_{(4)} = 6.8425;\ p = 0.1444$) verifies the validity of the instruments used in the equation.

Table 4: Dynamic panel model results

Dependent variable: profit (NIM)

Variable	Coefficient	Std. error	p-value	95% Confidence interval
$Profit_{it-1}$	0.5975	0.2872	0.037	0.0346; 1.1603
diversification	-0.1868	0.0751	0.013	-0.3340; -0.0395
Credit risk	-0.0646	0.0379	0.089	-0.1390; 0.097
Funding cost	-0.3331	0.1029	0.001	-0.5349; -0.1313
Market share	-0.4004	0.1378	0.004	-0.6705; -0.1303
Constant	19.940	3.5195	0.000	13.0418; 26.8381

Sargan test; $\chi^2_{(4)} = 6.8425;\ p = 0.1444$

The results show that the estimated coefficient for the lagged profit variable is positive and significantly different from zero, implying persistence of bank profitability over the 2011 to 2014 time period. Hoffmann (2011) and Perera, Skully and Chaudhry (2013) also report similar positive relationships. Although, Barros et al (2007) argue that diversification within a bank does not necessarily mean improvement in bank profitability, most empirical studies have found either a positive relationship between bank profitability and diversification (Dietrich and Wanzenried, 2011; Ommeren, 2011) or no relationship (Nassreddine et al, 2013; Schipper, 2013). However, the results in this study show that the diversification adversely affects profitability of commercial banks in Zimbabwe and this finding is inconsistent with the predictions of the Harry Markowitz Modern Portfolio theory.

The coefficient on funding cost variable is negative and significant. Dietrich and Wanzenried (2011), Lindblom *et al*. (2010) and Schipper (2013) reported similar results. Consistent with prior empirical findings of Hoffmann (2011) market share is adversely related to bank profitability

5. Summary and Conclusion

This empirical research sought to assess whether profitability of Zimbabwean commercial banks has significantly changed over the period 2011-2014 and the results suggest that bank profitability reached its peak in 2012 (10.79%) but declined to its lowest level in 2014 (7.7%). The second objective of the study was to identify bank specific factors associated with profitability of commercial banks in Zimbabwe. The results suggest that diversification, funding cost and market share have a significant negative effect on profitability of commercial banks in Zimbabwe. However, macroeconomic factors have not been considered in this study, therefore further studies that incorporate macroeconomic variables are needed in this area.

References

Alexiou, C. & Sofoklis, V. (2009). "Determinants of bank profitability: Evidence from the Greek banking sector", *Economic Annals* 14(182), 93-118.

Alper, D.& Anbar, A. (2011), "Bank Specific and Macroeconomic determinants of commercial bank profitability: Empirical Evidence from Turkey", *Business and Economics Research Journal* 2(2), pp. 139-152

Ani, W.U, Ugwunta, D.O., Ezeudu, I.J.& Ugwuanyi, G.O. (2012), "An empirical assessment of the determinants of bank profitability in Nigeria. Bank characteristics panel evidence", *Journal of Accounting and Taxation* 4(3),38-43.

Athanasoglou,P.P., Delis, M.D.& Staikouras, C.K. (2006), "Determinants of Bank Profitability in the Southern Eastern European Region", *Bank of Greece working paper*, 47

Azan, M., & Siddiqui, S. (2012), "Domestic and Foreign Bank's Profitability: Differences and their Determinants", *International Journal of Economics and Financial issues* 1(2), 33-40

Barros, C. P., Ferreira, C. & Willians, J.(2007), "Analysing the determinants of performance of best and worst European banks: A mixed logit approach", *Journal of Banking and Finance* 31(2), 2189–2203.

Bektas, E. (2014), "Are the determinants of bank net interest margin and spread different? The case of North Cyprus", *Banks and Bank System* 9(4), 82-91.

Bhatti, G.A.,& Hussain, H. (2010), "Evidence on Structure Conduct Performance Hypothesis in Pakistani Commercial Banks", *International Journal of Business and Management* 5 (9), 174-187.

Curak, M., Poposki, K. & Pepur, S. (2012), "Profitability determinants of the Macedonian banking sector in changing environment", *Procedia- Social and Behavioral Sciences,* 44(1), 406-416.

Davydenko, A. (2011), "Determinants of Bank Profitability in Ukraine", *Undergraduate economic Review* 7(1), 1-30.

Dietrich, A., & Wanzenried, G. (2011), "Determinants of bank profitability before and during the crisis: Evidence from Switzerland", *Journal of International Financial Markets, Institutions and Money* 21(3), 307-327.

Hassan, M.K & Bashir, A.M. (2003), "Determinants of Islamic Banking Profitability", *ERF paper.*

Hoffmann, P. S. (2011), "Determinants of the Profitability of the US Banking Industry", *International Journal of Business and Social Science* 2, (22), 255-269.

Kutsienyo, L. (2011), "The determinant of profitability of banks in Ghana", *Masters of Business Administration thesis,* Kwame Nkrumah university of Science and Technology.

Lindblom, T., Olsson, M. & Willesson, M. (2010), "Financial Crisis and Bank Profitability", *Wolpertinger conference paper.*

Nassreddine,G., Fatama, S. & Anis, J. (2013), "Determinants of Banks Performance: Viewing Test by Cognitive Mapping Technique", *International review of Management and Business Research* 2(1), 20-36.

Ommeren, S. (2011). An Examination of the Determinants of Banks' Profitability in the European Banking Sector. *Erasmus University Rotterdam, Erasmus School of Economics, Department of Accounting & Finance*.

Ongore, V. O. & Kusa, G. B. (2013). Determinants of financial performance of commercial banks in Kenya. *International Journal of Economics and Financial Issues*3(1), 237-252.

Owuputi, J.A., Kayode, O.F.& Adeyefa, F.A. (2014), "Bank Specific, Industry Specific and macroeconomic determinants of bank profitability in Nigeria", *European Scientific Journal*, 10(25), 408-423.

Perera, S., Skully, M.& Chaudhry, Z. (2013), "Determinants of Commercial bank profitability. South Asian Evidence", *Asian Journal of Finance and Accounting*, 5(1), 365-380.

Schipper, J.E. (2013), "The Determinants of Bank profitability through the Global Financial Crisis: Evidence from Slovakia and Poland", *BA thesis*, Haverford College.

Sufian, F.& Habibullah ,M.S.(2009), "Determinants of bank profitability in a developing economy: Empirical evidence from Bangladesh", *Journal of Business economics and management*, 10(3), 207-217.

Trujillo-Ponce, A. (2013), "What determines the profitability of Banks? Evidence of Spain", *Journal of Accounting and Finance*, 53 (2), 561-586.

Wolfe, S., & S. Sanya, S. (2011). Can banks in Emerging countries benefit from revenue diversification? *Journal of Financial Services*, 40 (1), 79-101