MASTERS THESIS

AN EMPIRICAL ANALYSIS OF THE INTERPLAY AMONG BANK COMPETITION, BANK STABILITY AND REGULATION: A CASE STUDY OF BANKS IN ZIMBABWE

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ABSTRACT

This study empirically examined the interconnection among bank competition, regulation and stability of eighteen Zimbabwean banks during the period 2011-2017. Zscore, Capital Adequacy Ratio (CAD), and Loans market share and Deposits market share which are proxies for stability, regulation and competition respectively were examined firstly using the Panel Vector Autoregressive (PVAR) model. Model 1 used loans market share as a proxy for competition and model 2 used deposits market share instead. The stability test using Eigenvalue Stability Condition showed that the PVAR model is unstable. Secondly, the above variables and five bank specific variables (i.e., credit risk, management efficiency, liquidity, return on assets and bank size) were estimated using the Feasible Generalised Least Squares (FGLS) model. The study documents that competition positively contributed to stability and regulation negatively influenced the stability of the Zimbabwean banks. Meanwhile, bank size and credit risk have a negative relationship with stability; management efficiency and liquidity have a positive relationship. Return On Assets has a negative and positive relationship with stability in model 1 and model 2, respectively. The findings implied that to enhance stability, banks must experience a competitive environment, reasonably low minimum capital requirements and cautiously designed regulatory frameworks.

Keywords

Competition, PVAR, FGLS, Zimbabwe, Regulation, Stability

LIST OF ABBREVIATIONS

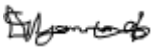
BC	Building Societies
BIBM	Bangladesh Institute of Bank Management
BCBS	Basel Committee on Banking Supervision
BLUE	Best Linear Unbiased and Efficient
CAD	Capital Adequacy
CAPR	Capital Requirements
CR	Concentration Ratio
CR	Credit Risk
CI	Competitive Intelligence
CABS	Central Africa Building Society
CoPS	Centre of Policy Studies
CI	Competitive Intelligence
DIDMCA	Depository Institutions Deregulation and Monetary Control Act
DEA	Data Envelopment Analysis
DUMCOM	Dummy for Commercial Banks
DUMSAV	Dummy for Saving Bank
ECR	Equity to Capital Ratio
E/A	Equity to Asset ratio
FGLS	Feasible Generalised Least Squares
FSB	Financial Stability Board
FNBS	First National Building Society
Fintech	Financial Technology
GLS	Generalized Least Squares
GNU	Government of National Unity
GMM	Generalized Method of Moments
HHI	Herfindahl-Hirschman Index
BCBS	Basel Committee on Banking Supervision
IFAC	International Federation of Accountants
IDBZ	Infrastructure Development Bank of Zimbabwe
IMF	Monetary Funds
Liqdty	Liquidity
LTA	Logarithm of Total Assets
M.Com	Master of Commerce
Mgnteff	Management Efficiency
NPL	Non-Performing Loans
NOW	Negotiable Order of Withdrawal
OLS	Ordinary Least Squares
PVAR	Panel Vector Autoregressive
ROA	Return of Assets
RBZ	Reserve Bank of Zimbabwe
ROE	Return on Equity
SFA	Stochastic Frontier Analysis
SEM	Structural Equation Model
SCP	Structure Conduct and Performance

US	United States
VECM	Vector Error Correction Model
ZBS	Zimbabwean Building Society
ZAMCO	Zimbabwe Asset Management Company

CORROBORATION OF AUTHORSHIP

I hereby proclaim that this submission is my own work, under the supervision of Dr. Juniours Marire, and that, to the best of my comprehension and belief, it contains no material formerly published or written by another person (except where unambiguously defined in the acknowledgments), nor material which to a generous extent has been submitted for the award of any other degree or diploma of a university or other institution of higher learning.

Nyamuronda, 03.01.2021



Author's signature

DEDICATION

To my parents, sisters, brothers, friends, nieces, and nephews

We have journeyed together and each one of
you have done his/her part that's worth memorable.

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CHAPTER 1

INTRODUCTION AND BACKGROUND

1.1. Introduction

The impact of competition on stability in Zimbabwe's banking sector is a much-debated subject by regulators, academics and policymakers. The global financial crisis of 2007-2008 highlights the importance of reducing the negative effect of a systemic banking crisis. This has led to an increase in the regulation of banks through a global comprehensive reform agenda to ensure that the financial system is resilient to financial disruption. Traditionally, regulators have been motivated to focus on policies that preserve stability in the banking sector due to the fear that an increase in competition may stir financial system fragility (Keeley, 1990). There is a lack of academic consensus on whether bank competition aids stability or it hinders stability in the banking system. There is a widespread debate in this regard and there are two opposing views namely: the competition-stability view and the competition-fragility view. From the competition-stability view perspective, competition can enhance stability as it promotes improvements in the screening of potential borrowers, new product innovation and diversification of loan portfolios (Fiordelisi and Mare, 2014; Kabir and Worthington, 2017). Based on the competition-fragility view, competition may erode the franchise value of a bank and as a survival strategy; banks usually undertake high-risk strategies which may lead to bankruptcy (Corbae and Levine, 2018).

Weaknesses which are currently being seen in the global economy are traced to inconsistencies in the regulatory regimes for the financial sector (Noman, Chan and Isa, 2018). The blame is put on financial liberalization which removed barriers to entry and branching restrictions (Berger, Klapper and Turk-Ariss, 2009). This led to increased competition in the banking sector which eroded banks' profit margins coupled with the fact that banks might have taken excessive risks to increase returns (Carletti and Hartmann, 2003). Crises which top the list when literature in support of the competition-fragility view is discussed are the US savings and Loans crisis in the late 1980s and the Japanese crisis in the 1970s as banks practised excessive risk-taking (Hellmann, Murdock and Stiglitz, 2000).

Therefore, there has been a rise of an international financial architecture that contests for interplay between both private and public authorities that establish rules and boundaries to

govern global financial resources. To name but a few of these influential monitoring entities: The World Bank, the Basel Committee on Banking Supervision (BCBS), the International Federation of Accountants (IFAC), Credit Rating Agencies and large multinational audit firms (De Bellis, 2020). Their presence is to curb poor supervision of banks, misleading financial reports and weak corporate governance within the financial sector. BCBS's 'Core principles for effective Banking Supervision' is amongst the recommended list of standards. While setting standards for achieving financial stability is crucial, the extent to which the standards are implemented effectively is important.

Regulation has been debated in the banking sector and the events leading to the 2007-2008 financial crisis have increased attention to bank regulation across the globe. According to Delis, Molyneux and Pasiouras (2011), most regulations in banks have largely taken the form of a capital base relating to the first pillar of Basel II namely, capital requirements (CAPR). The bank risk-regulation nexus has literature which suggests that regulation and its enforcement are responsible for shaping the performance of banks (Barth, Caprio and Levine, 2007). Hakenes and Schnabel (2011) argue that stringent capital requirements (regulation) can hurt bank stability because it influences competition and it may not be suited to all circumstances. Stricter regulation favours bank stability during non-crisis periods. Other empirical studies provide support for the stabilising effect of bank capital. Demigurc-Kunt, Detragiache and Merrouche (2010) study done on international banks before the 2007-2008 crisis determine a positive relationship between banks' capital ratios and stability. Capital adequacy is important to ensure sufficient capital to avoid bank runs and also to maintain bank solvency (Dermine, 2013). Berger and Bouwmann (2012) study on the US banking industry identified a similar positive impact of bank capital on the probability of banks' survival.

However, in times of a systemic banking crisis, stricter regulation may lead to a greater reduction in stability. Barth, Dopico, Nolle and Wilcox (2002) study show that higher levels of non-performing loans (NPLs) are associated with the presence of more powerful government supervisors. The negative effect of strict regulation on stability is suggested to channel through Berger and De Young (1997): "bad management", "skimping", "moral hazard" and "bad luck" hypotheses. In crisis periods ("bad luck"), increased competition may stifle monitoring incentives by banks' managers as they take on risky projects with the attendant likelihood of failure ("bad management" and "moral hazard"). Central banks may react to the effects of bad management by increasing capital requirements figures to cushion against high NPLs. Stringent capital regulations reduce the amount of credit available and may increase the incentives for banks to

provide funds to firms with which they maintain lending relationships. This is to reduce near-term costs by cutting underwriting, monitoring and controlling costs of the borrower to increase long-term profits ("skimping") (Lundtofte, Quadt and Nguyen, 2016). Low costs from choosing to put less effort in loan monitoring and control are associated with loan performance problems. This highlights how bank regulation policies meant to promote efficiency spiral inefficiency in the system.

The competition-fragility view supports strict capital requirements and restrictions on banks' activities as they foster a decrease in competition and this will enhance stability. In systems where banks are cushioned by restrictions on entry, banks have better profit opportunities hence fewer incentives to take aggressive risks (Liu, Molyneux and Wilson, 2013). On the other hand, the competition-stability view argues that restrictions may lead to the dominance and protection of a few large banks in the sector leading to rent-seeking and the moral hazard problem of too-big-to-fail.

The effect competition has on stability is case-dependent. Claessens and Laeven (2004) study report that the effect depends on financial development. Their empirical findings show that financially dependent industries in countries with less developed financial systems grow faster when the banking system is less competitive. On the other hand, competition is associated with high growth in more developed financial systems (Claessens and Laeven, 2004). Another significant contribution to the debate is the work of Berger *et al*. (2009) which notes that the two views regarding the effects of competition and market power on stability need not necessarily yield opposing predictions. In their study, higher degrees of market power as measured by either the Lerner Index or the HHI-deposit index imply a less competitive environment. In line with the "competition-fragility" view, the results suggest that banks with more market power enjoy less overall bank risk. The findings also lend support to the "competition-stability" view because the results indicate that banks with a higher degree of market power bear significantly more loan portfolio risk, but this risk may be offset in part by these banks holding significantly more equity capital.

Overall, the relationship between competition and stability varies across markets with different 1) regulatory frameworks, 2) market structures and 3) levels of institutional development. Thus, a cost-benefit analysis should be carried out to cater for the unique variables in each country. It is important to control for differences in regulatory practices and institutional environment across countries. However, this will not be necessarily applicable to

this study as it is an intra-country type of research, the Zimbabwean banking sector to be specific.

1.2. Background

The Zimbabwean economy has experienced a difficult time for two decades (1998-2019), which came to a temporary halt in 2009 after the nation dollarized adopting a basket of currencies dominated by the South African rand and the United States dollar (Nkomazana and Niyimbanira, 2014). Post dollarization, bank failures did not seize, and so as economic hardships, severely for financial institutions that had liquidity and credit problems. The period was dominated by episodes of loans extended by banks failing to perform and several reported cases of bank failures. Therefore, this section looks at the overview of the banking industry in Zimbabwe with a closer look at trends of key indicators and changes in policies.

1.2.1. Overview of the banking industry in Zimbabwe

The Zimbabwean economy was distressed by high inflation in the 1990s and leading into the 21st century. The inflationary environment shrunk the banks' balance sheets and reduced their profits. The economic hardship made saving by households difficult hence banks faced a decrease in deposits (Abel and Le Roux, 2016). A fall in deposits meant banks had hardships in creating loans which is a source of revenue for them. This forced them to look to other places to fund their lending. Within the banking system, there was a misuse of the overnight "accommodation window". Most banks would borrow from each other to finance their daily transactions, which goes to show that banks were running on losses.

Some regulation policies which were skewed because they favoured one type of bank over the other led to the demise of some Building Societies. Since the 20th century, Building Societies (BS) were important because they worked with the local government through a process where local authorities provided the land and BS provided the finances for mostly low-income housing projects. Beverly, Founders and Central Africa Building Society (CABS) were well functioning after surviving the demise of other BS in the 1960s (Kamete, 1999). However, they still faced obstacles. These three BS were competing with one Post Office Savings Bank (POSB). Before 1984, POSB was more competitive because in addition to offering higher interest rates, these rates were tax-free since it is a government-owned bank. BS faced unfair competition especially in comparison in terms of their savings rates which were liable to a 30% withholding tax. This made attracting savings difficult for BS. Moreover, BS banks were not

allowed to participate in the money market hence difficulties in raising enough funds to meet their liquidity demands and for mortgage loans. Even post the 1980's, the POSB has remained unassailable than BS. Reasons include the protection it gets from the government as it shields it from competitors through crippling financial controls of rival banks. The government has good reasons to do this, POSB is a quasi-government institution and the government raises money on the domestic market through POSB (Moyo, 2001). So, the central bank would see to it that its major source of domestic borrowing almost monopolizes the deposit-taking market. The government seemed to pay attention to the plight of BS in the 1990s as two more BS joined the market, namely The Zimbabwean Building Society (ZBS) and First National Building Society (FNBS) in 1991 and 1996 respectively. By 1992, the government responded to the plight of BS as they were granted permission to operate in the money market and this greatly improved their plight of liquidity shortages (Rakodi, 1995).

Globalisation affected how banks worldwide conduct their business. Regardless of the observation that local banks are generally more willing to extend credit to locally owned businesses (Brownbridge, 2012), Zimbabwean banks were not spared from the impact of globalisation. The entry of foreign banks into the banking sector brought new technology such as telephone, video, mobile and online banking and many banks had to adapt to remain reverent in this information age. Dube *et al*. (2008) posit that the first visible form of electronic innovation was in the early 1990s when Standard Chartered Bank installed Automated Teller Machines (ATMs). Banks in Zimbabwe experienced heightened e-commerce competition in the sector in the form of an electronic revolution as almost all banks engaged in electronic banking (e-banking). E-banking is beneficial to banks as it improves their profitability and efficiency and it makes it easy for them to market their products. Likewise, customers also benefit from e-banking because of its security, convenience, efficiency, ease of access and affordable charges (Mavaza, 2019). The more a bank can meet the e-banking service needs of customers, the more competitive it is and can outdo its rivals. Most bank executives in Zimbabwe agreed that investment in electronic commerce improved competitiveness, increased bank productivity, growth and customer retention (Njanike, 2010; Chirima and Chikochi, 2016). Customer retention through meeting their service needs is of priority. A bank that fails at this runs the risk of going out of business (Dondo *et al*., 2020).

There is a possibility of negative shocks emanating from globalization which can lead to an increase in competition which can result in the weakening of the local banking sector. Tetteh (2014) argues that for competition to be rational, local banks are supposed to have a

comparative advantage over foreign banks operating in the domestic market. This is barely the case as most foreign banks are more efficient in comparison to domestic banks and Tetteh (2014) attributes this to advanced technology and easy access to capital wielded by foreign bank institutions. The entrance of foreign banks into Zimbabwe's domestic banking market posed some challenges. It brought stiff competition as local banks competed with large international banks with established reputations. Prior to dollarization, local banks experienced a flight to quality situation where clients moved their deposits to established international banks. The market share of the top four banks increased to 97 per cent at the peak of the hyperinflation in 2008 reflecting the flight-to-quality experiences (Sanderson and Le Roux, 2016). There was also a problem of rising foreign deficits in the host country emanating from profit transfers (Gupta, 2002).

Roger Boka's United Merchant Bank was the first bank to be reported bankrupt and closed down in 1998 (Dzomira, 2014). The collapse of ENG Capital and Century Discount House in 2003 culminated in a systemic shock of wholesale bank runs in Zimbabwe, and more banks failed as they were either placed under curatorship and/or closed (Makena, 2021). The financial turmoil deepened, and the Central Bank temporarily withdrew from its role of lender of last resort the same year and by the end of the year, 13 banks in total had collapsed.

Zimbabwe dollarized in February 2009 in response to the severe macroeconomic disruptions which had created disorder in the economy, by then, the number of banks had dropped to 28 from 42 in 2003 (Abel and Le Roux, 2016 and Makena, 2021). Macro stability was instilled, and inflation dropped sharply as it dropped as low as into negative territory between 2014 and 2015. However, dollarization came with both pros and cons in the banking sector. Banks' businesses were running smoothly as there was substantial growth in deposits, loans and assets. The total amounts of deposits, loans and assets increased by US$3.33 billion, US$3.74 billion and US$3.93 billion respectively between 2009 and 2014 (Reserve Bank of Zimbabwe, 2010 and Reserve Bank of Zimbabwe, 2015).

The transition to the new dollarized environment was not a smooth process for banks. Under the multi-currency system, the collapse of banks and banks placed under curatorship did not seize. There was a decrease in the number of banks too during the multicurrency era. By mid-2014, the number of banks in the sector had decreased to 20 banks from 28 shortly before dollarization (Reserve Bank of Zimbabwe, 2014). Moreover, during the era, the Central bank cancelled the operating licenses of 6 banks and placed 1 bank under curatorship. The negative

trend remained an issue as the sector continued to be dogged by some weak banks, low capitalisation and high levels of NPLs (an average of 16.6% in March 2014). These hindrances led to the inability of most banks to meet deadlines with the RBZ. As of 31 December 2017, 19 banks were in operation and 6 were foreign-owned. The most prevalent issues contributing to bank failures have been poor corporate governance, imprudent lending activities and failure to meet the stringent regulatory capital requirements (Chidziva, 2016).

Banks' foreign currency reserves were jeopardized in the multi-currency environment and this was coupled with the central bank's poor planning in offering liquidity support to banks. The role of the central bank to provide the lender of last resort was constrained and banks turned to borrowing from private sources. New capital thresholds were set by the central bank and some banks struggled to meet these new capital requirements. For example, in 2012, the minimum capital requirement was set to US$100 million from US$12.5 million (Jabangwe and Kadenge, 2015). To cope, banks adopted survival strategies which include risky lending practices to increase their customer base, increasing trade margins and hiking their service fees (Abel and Le Roux, 2016).

Plights faced by banks in mobilizing deposits and demand for loans are evident in the interest rates that banks quote. An increase in interest rates may signal that a bank is facing challenges to attract new deposits so it offers higher interest rates. On the other hand, the bank would charge a lower lending rate to attract borrowers; therefore, a widening interest rate spread is an indicator of inefficiency. Lending rates vary widely, commercial banks in Zimbabwe charge a rate ranging between 6% and 35% compared to the 15% to 30% charged by Merchant Banks (Bonga, 2016). Banks in tight liquidity positions offered low lending rates to attract borrowers. Commercial banks are usually large banks which gives them an added advantage of reputation with clients. Also, commercial banks are regarded as part of the highly valued modern business sector; whose position the government might not dare challenge for fear of a large-scale withdrawal of capital and skills (Harvey, 2002). So, they have the leeway to charge high lending rates without a great loss in clients. The nature of Building societies' business of offering credit for low-cost housing loans means they are restricted from charging exorbitant interest rates on loans. The multicurrency era had most banks charging interest rates of up to 40% (Gwandekwande, 2017).

Several factors have destabilized the financial sector stability in Zimbabwe. The Central bank has limited capacity to fulfil its role as a lender of last resort which is a necessity for

liquidity assurance. Notwithstanding the benefit of progress made in stabilizing the economy after dollarization, the banking sector still faced challenges as dollarization rendered monetization of deficits impossible. Moreover, the multicurrency system presented a challenge of loss of monetary policy autonomy which limited the central bank in implementing counter-cyclical monetary policy. Some banks in the sector were failing to reach critical mass because the challenges witnessed in the sector led to low consumer confidence (Reserve Bank of Zimbabwe Financial Stability Report, 2014).

The Reserve Bank of Zimbabwe (RBZ) has been trying to implement the Basel II and Basel III capital allocation codes. The RBZ Governor in the Reserve Bank's Annual report, 2018 states, "The Reserve Bank has adopted a gradual approach in the implementation of the Basel III framework." Persistent economic hardships hinder the efforts of the central bank to fully implement the advanced Basel accords (Chinomona, 2017). The RBZ has not abandoned its central role of regulation as its operational philosophy is based on two aspects of Basel II namely i) banks are required to hold a separate capital as a buffer in the case of financial crises and ii) the need for rigorous regulation on erring financial institutions (Ojiako *et al.*, 2013). However, it is questionable whether it has been effective in implementing these policies as most bank closures are reported to be caused by banks' involvement in non-core activities and failure to meet the minimum capital requirement. Although it is agreed that capital is a dominating factor in the overall performance of banks, Mbizi (2012) study on Zimbabwe's banking sector points out that capital levels should be bank-specific based on the risk profile of each bank.

1.2.2. Trends in the Zimbabwean Banking Sector

1.2.2.1. Total assets, total loans, total deposits and NPLs

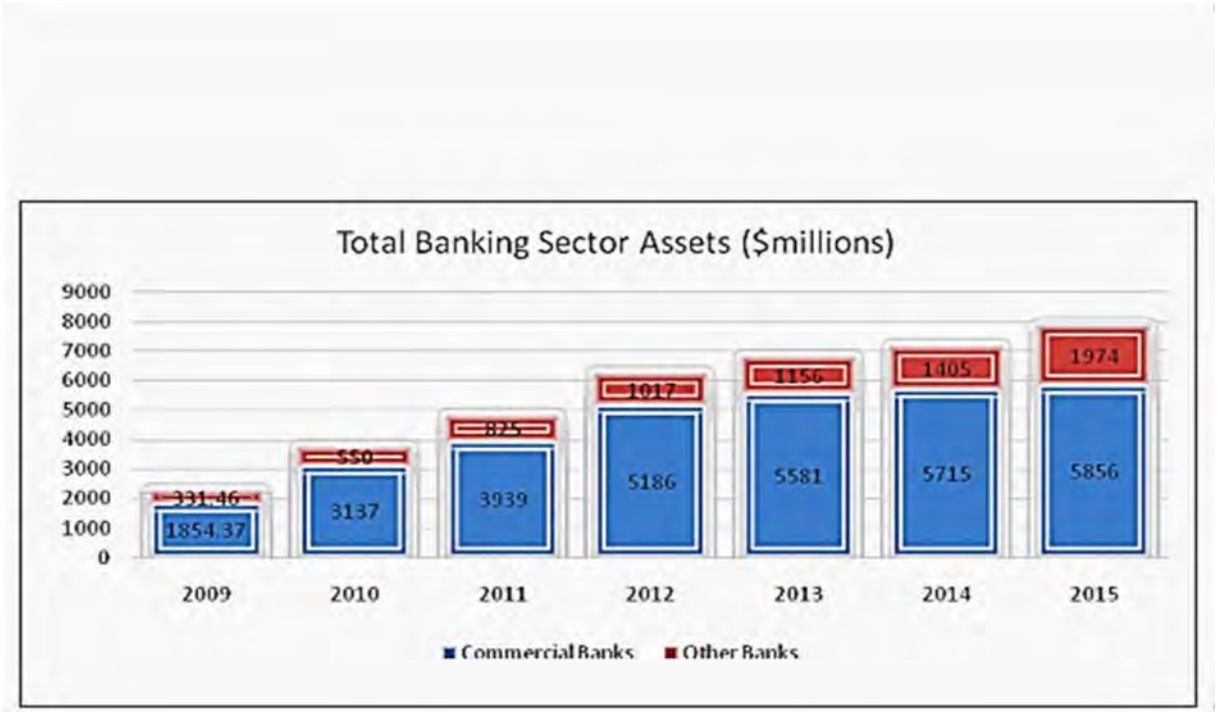
Commercial banks dominate the Zimbabwean banking sector; usually, they own roughly 85% to 95% of the financial sector assets. Table 1 below which shows the composition of the Zimbabwean banking sector from 2011 to 2017 makes the dominance of commercial banks evident. Moreover, Figure 1 shows the banking sector composition of total assets. Commercial banks maintain their dominance as they have a greater share of total assets in the entire sector. Both commercial banks and other banks have a rising trend in the value of assets over the period. Asset growth was mainly driven by rises in balances with the central bank, securities and investments which were largely funded by an increase in deposits (Reserve Bank of Zimbabwe, 2017).

Table 1: **Composition of Banks in Zimbabwe (2011-2017)**

Type of Bank	2011	2012	2013	2014	2015	2016	2017
Commercial Bank	17	17	16	15	14	13	13
Building Societies	4	4	3	3	3	4	5
Savings Bank	1	1	1	1	1	1	1
Total	22	22	20	19	18	18	19

*Source**:** Reserve Bank of Zimbabwe Monetary Policy, (2017)*

Figure 1: **Total Banking Sector Assets**

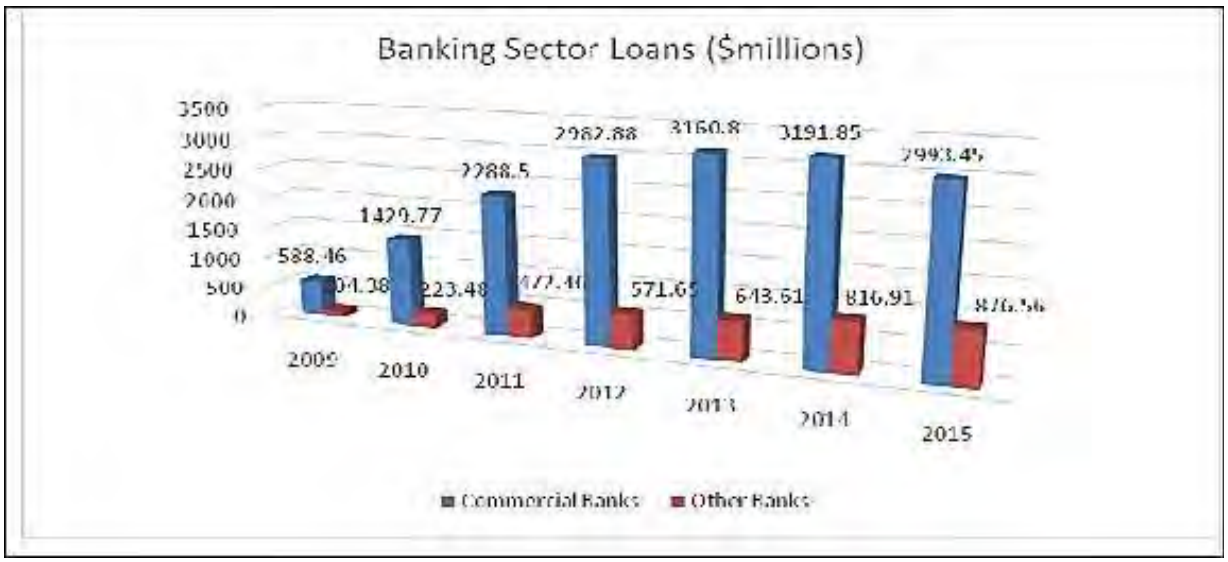


Source: Reserve Bank of Zimbabwe Reports, (2017)

Banks compete through the loan market and deposit market. Figure 2 below shows the number of loans extended to the economy by banks and how they are divided between commercial banks and other banks. Once again, commercial banks dominate the loans market. The trend over the period has been a sharp increase in loans until 2013 and a marginal rise in 2014 followed by a marginal drop thereafter. This is further depicted in Figure 3 which plots the total loans in the banking sector on a line graph. The growth in credit until 2014 is a result of confidence in the economy after the introduction of the United States dollar. Most businesses were starting up and investments were on the rise hence the request for loans. This resulted in a build-up of credit risk as evidenced by increases in risk-weighted assets. The notable stagnation

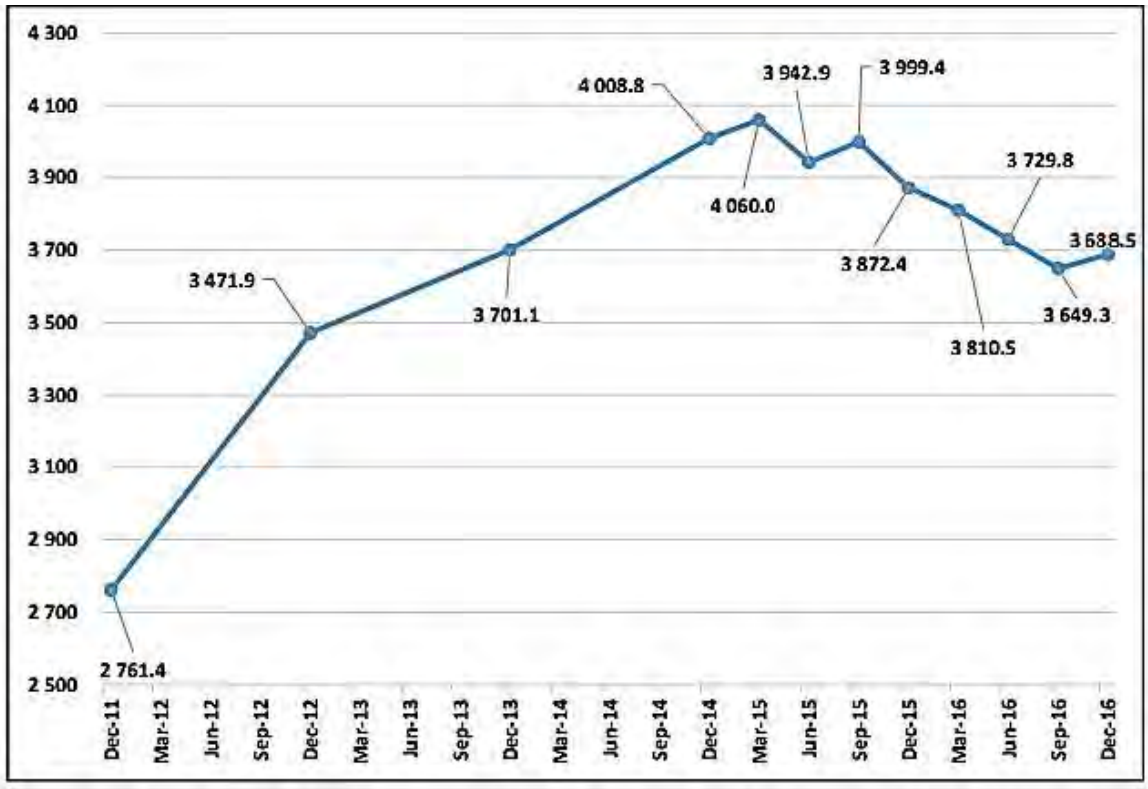
in loan growth rate after 2014 reflects heightened credit exposure and banks adopted a conservative lending approach (Reserve Bank of Zimbabwe, 2014).

Figure 2: **Banking sector loans categorized**



Source: Reserve Bank of Zimbabwe, (2017)

Figure 3: **Trend of banking sector loans: 2011 to 2016 (US$m)**

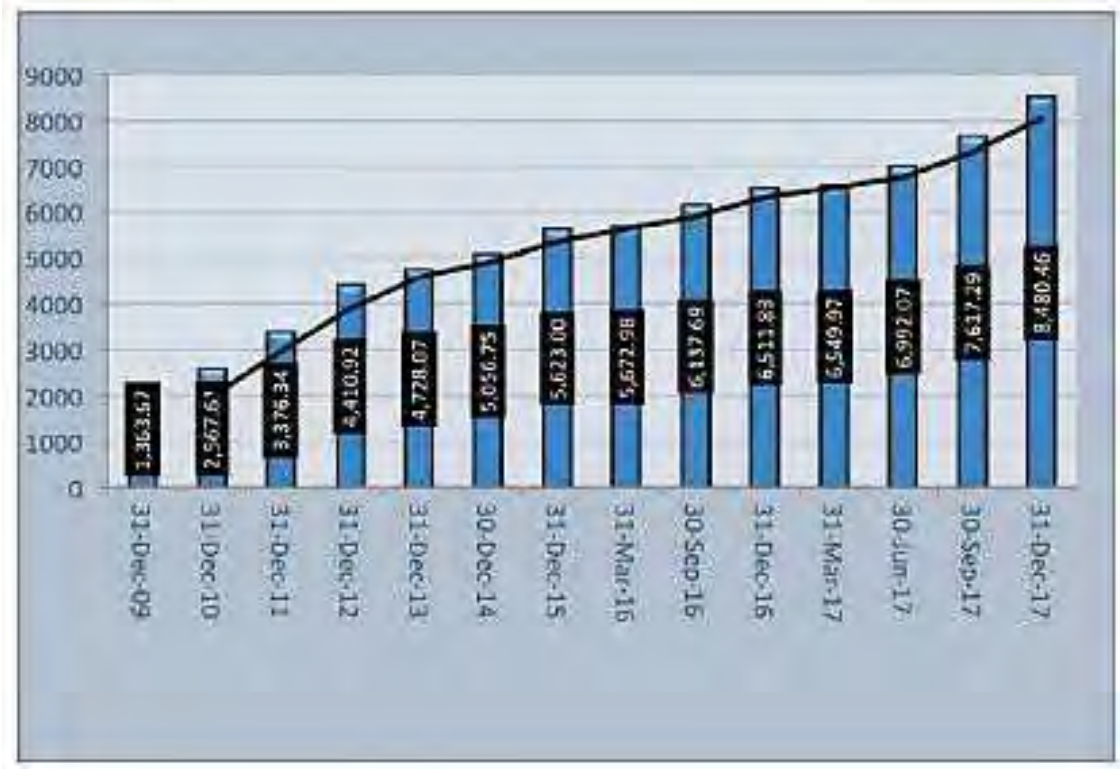


Source: Reserve Bank of Zimbabwe Annual Report, (2017)

The trend of total banking sector deposits is shown in Figure 4 below over the period December 2009 to December 2017. Growth in deposits has been consistent as the graph

presents an upward trend. This is a reflection of renewed confidence in the banking sector and economic activity since the introduction of the new minimum capital thresholds (Chinoda, 2014). Also, the introduction of the multicurrency system resulted in increases in industrial production and a rise in salaries (Abel and Le Roux, 2016). Banking sector deposits as of 31st December 2017 were $8.48 billion, in comparison to $6.51 billion as of 31st December 2016 which is a percentage growth of 30.26% (Reserve Bank of Zimbabwe Annual report, 2017).

***Figure 4*: Banking sector total deposits**



Source: Reserve Bank of Zimbabwe, (2017)

Figure 5 shows the value of NPLs to total assets ratio for the period 2011 to 2017. Generally, NPLs were on the rise up to 2014. This might be due to increased lending caused by aggressive lending that most banks adopted during the Government of National Unity (GNU) which ended in 2013 (Chikoko *et al*., 2012). There is a sustainable reduction in NPLs as the level of NPLs is trending downwards. During the year 2016, qualifying loans were disposed to the Zimbabwe Asset Management Company (ZAMCO) and NPLs dropped from 20.45% to 7.87% as of 31st December 2016 (Reserve Bank of Zimbabwe, 2016). Between December 2016 and December 2017, NPL to total loans ratios were 7.87% and 7.08% respectively (Reserve Bank of Zimbabwe, 2017). This is indicative of an improvement in the number of NPLs in the sector. This is in response to some holistic NPL resolution policy measures put in place by the Central Bank and Government focused on cultivating responsible borrowing culture. Most

banks took advantage of the Credit Registry which strengthened their credit risk management system. It is a system where all banks' credit data is uploaded into the Credit Registry system and updated continuously. Banks that subscribe to this system can access this data at a minimal cost.

Figure 5: **Trend in Non-performing loans 2011-2017**

Source: Reserve Bank of Zimbabwe Annual Report, (2017)

1.2.2.2. Profitability

Average figures of two indicators of bank profitability: Return on assets (ROA) and Return on Equity (ROE) are plotted in Figure 6. There was a decline in ROA and ROE from 2011 to 2013 as the banking sector continued to be affected by institution-specific deficiencies as well as macroeconomic factors. Losses reported by most banks were attributed to high levels of NPLs which increased provisions for loan losses and lack of critical mass to generate sufficient inflows to cover expenses (Mutava, 2017). Profitability took a turn in 2014 as it shows an upward trend. According to the Reserve Bank of Zimbabwe (2014) report, this was attributable to cost containment measures, a decrease in operating expenses and a decrease in provisions for bad loans since NPLs decreased from 2014 (Figure 5). ROA improved from 2.26% as of 31 December 2016 to 2.61% as of December 2017. ROE improved from 10.96% as at 31st December 2016 to 15.50% as at 31st December 2017. The improvement in profitability

between these two years can be attributed to an increase in net profit. Percentage growth in net profit was reported as an increase of 33.91% between 2016 and 2017. The banking sector's net profit as at 31st December 2016 was $181.06 million in comparison to $241.94 million as at 31st December 2017.

Figure 6: **Profitability indicators**

Source: Reserve Bank of Zimbabwe, (2017)

1.2.2.3. Capitalisation

Table 2: **Capital Ratios, December 2009 to June 2014**

Capital Adequacy	Dec-09	Dec-10	Dec-11	Dec-12	Dec-13	Jun-14
Regulatory capital to risk-weighted assets	27.26	27.34	14.67	17.62	19.33	18.56
Percentage of banks greater or equal to 12 percent	100.0	87.5	88.9	88.9	88.9	81.3
Percentage of banks below 12 and above 6 percent minimum	0.0	0.0	0.0	11.1	5.6	0.0
Percentage of banks below 6 percent minimum	0.0	12.5	11.1	0.0	5.6	18.8
Capital to assets	12.0	9.4	9.3	6.6	9.2	4.9

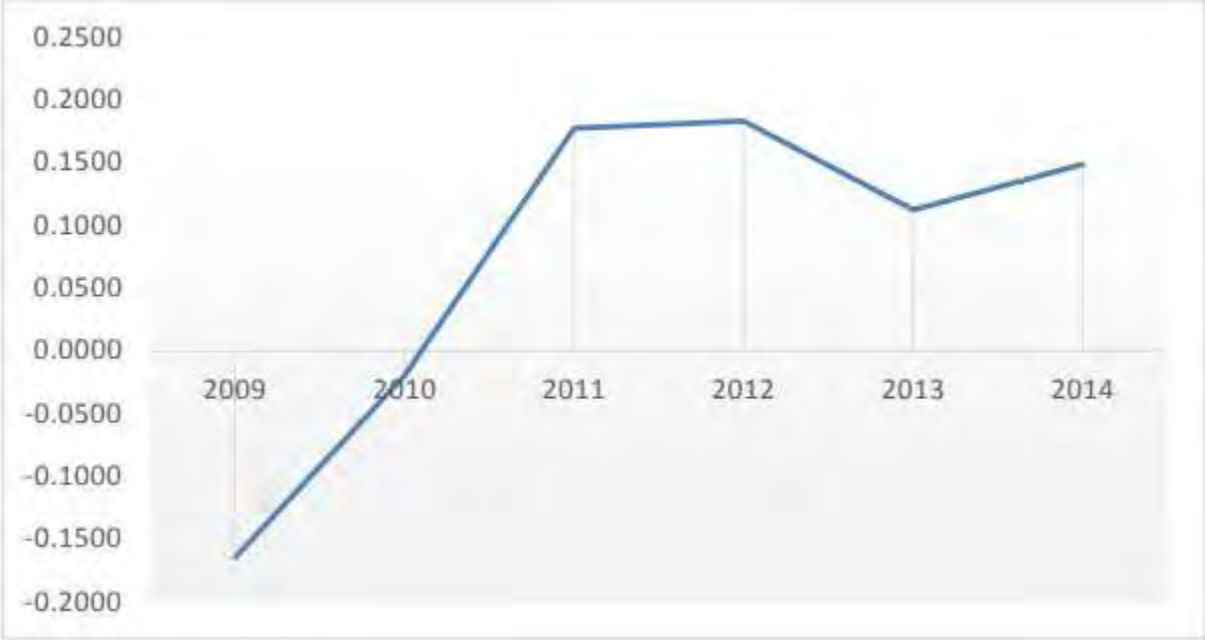
Source: Reserve Bank of Zimbabwe, (2014)

As of June 2014, the trend in banking sector capital since 2009 shows a decrease in Capital Adequacy Ratio in Table 2 above. This is mainly attributed to challenges faced by banks relating to the recapitalisation of their lending operations after the adoption of the multi-currency system in 2009 (Chowa, 2017). There has been a progressive increase in CAD since

December 2014 and this is attributed to organic growth in capital and an increase in short-term investments (Reserve Bank of Zimbabwe, 2017). At the end of 2017, banks had an aggregate core capital of $1.37 billion in comparison to $1.15 billion in December 2016, which is an increase of 19.13% on the back of improved net profit (Reserve Bank of Zimbabwe, 2017). As of December 2017, the Zimbabwean Banking Sector was adequately capitalized as all banks complied with the minimum required capital adequacy ratio and tier 1 ratio of 12% and 8% respectively. Figures for average capital adequacy ratio and tier 1 ratio were 27.63% and 23.97%, respectively (Reserve Bank of Zimbabwe Annual Report, 2017). These figures are well above the mandatory 12 % and 8% indicating most banks do hold capital well above the minimum required capital adequacy ratio.

1.2.2.4. Evaluation of Market Power

Figure 7: **Evolution of Lerner Index**



Source: Abel and Le Roux, (2016)

The Lerner index declined during the period 2011-2013, showing a decrease in market power during the period. The market power of banks to set prices above marginal cost became constrained as economic growth started to decline and banks recorded high amounts of non-performing loans (Figure 5). Operating in such economic conditions required that banks tighten their screening of clients to avoid risky borrowers; hence they had to charge lower interest rates

to match the low-risk profile of these borrowers. The market power to price was further constrained by the memorandum of understanding (Abel and Le Roux, 2016).

1.2.3. Change in policies

As of 2017, several developments and supervisory activities had been conducted to bolster confidence and promote bank stability. Bank risk was assessed based on on-site examinations to determine the level of risk each bank was facing, the measures it had put in place to effectively manage the risk and its progress in complying with all applicable regulatory laws, set supervision standards and prudential guidelines. The Central Bank participated in supervisory colleges which brought cross-border banking sectors together, encouraging information sharing, coordination, cooperation and collaborations (Reserve Bank of Zimbabwe, 2017). An initiative to retain depositors' trust in the banking system was a pay-out made out of the Deposit Protection Fund to compensate depositors who had lost their funds to bank failures. By 31 December 2017, $3.2 million had been paid which is half of the total exposure of $6.4 million (Reserve Bank of Zimbabwe, 2017).

As of 31 December 2017, the Credit Registry was fully operational. On record, 350000 loan records were in the system representing 96.6% of banking sector loan records. Participants who made use of this data were made up of 19 banks and 89 microfinance institutions. Consumers' awareness of the functionality of the Credit Registry would promote a healthy credit culture so banks embarked on outreach programs to educate consumers on the positive implications brought by the Credit registry system (Reserve Bank of Zimbabwe Annual report, 2017).

In adherence to Basel Accords, in June 2017 the Central Bank conducted a pilot Quantitative Impact Assessment to assess the impact an increase in provisions for bad loans would have on stability. The assessment determined that the impact was positive so it took an extra step to assess if banks had adequate reserves to absorb the shocks in the loan market (Reserve Bank of Zimbabwe, 2017). As per the requirements of the new standard, this process is ongoing and reserves are frequently updated based on changes in expected bad and doubtful debts.

Before 2015, new laws on risk management and corporate governance did not apply to other banking entities such as the Infrastructure Development Bank of Zimbabwe (IDBZ), Building Societies and POSB. This changed prior to the announcement of Banking Act

Amendment No. 12 of 2015 as the aforementioned laws became applicable too to these three banking entities (Reserve Bank of Zimbabwe, 2017). In 2017, the RBZ slashed the lending rates of Building societies (BS) to 12%. Many clients, therefore, found BS loans to be affordable and that unlocked growth in the housing development sector (Gwandekwande, 2017).

With the advent of Financial Technology (Fintech), the Central bank noted that it is important for banks to ensure that they have adequate skills to meet the rollout of information technology and effective managerial skills to gauge risks associated with fintech developments. Given rising cases of cyber risk and card cloning reported at some banking institutions, the aforementioned skills are crucial to managing operational risk (Reserve Bank of Zimbabwe Supervisory Annual Report, 2018).

1.3. Goals of the Research

Although Zimbabwe's financial sector was liberalized to allow for market determination of stability, concerns about high NPLs and bank closures have persisted and attracted a lot of debate in both public and policy forums. Moreover, there has been little empirical research on the relationship between bank competition, stability and regulation after the multi-currency regime in Zimbabwe. Based on this background, we present research questions as follows. Firstly, does competition enhance financial stability in Zimbabwe's banking sector? Secondly, in light of this, do regulators need to tighten or loosen competition policy for Zimbabwean banking systems? Addressing these questions through examining the competition, regulation and stability hypothesis in the context of Zimbabwean banks will have important policy implications for both regulators and practitioners, especially in this economy which has had high inflation. Hence the research aims to determine the level of market concentration in Zimbabwean banks' operations and the interplay between competition and stability and also the role of regulation in this sector. The research will add to the body of knowledge on competition in the banking sector and how it brings about stability/fragility of the banking system in the light of regulation.

The specific research objectives of this study are to:

1. "Measure" the degree of competition in the banking sector in Zimbabwe.
2. "Determine" the effects of bank competitiveness and regulation on bank stability in Zimbabwe.

3. “Analyse” the relationship among regulation, bank competitiveness and bank stability within the Zimbabwean banking sector.

Some prior studies have investigated the stability of banks in Zimbabwe using several different techniques. However, to the best of our knowledge, no prior study has investigated all three: competition, stability and regulation in the Zimbabwean banks’ context. This research aims to shed light on the relation among regulation, competition and stability in Zimbabwe’s banking sector.

We select 18 banks which were in operation from the period 2011-2017. The empirical procedure is as follows. Firstly, we proxy market concentration in the industry using the Herfindahl-Hirschman Index (HHI). A higher HHI value indicates more market concentration (i.e., less competition). To proxy competition at the individual bank level, we use two ratios namely, loans to total loans and deposits to total deposits. This is informative because banks compete for both deposits and loans. Secondly, we proxy the level of stability using an accounting-based credit risk measure, the Zscore. Lastly, we use capital adequacy (CAD) to proxy regulation. We then use the Panel Vector Autoregressive (PVAR) estimation method to describe the relationship among regulation, competition and stability. We further conducted a complementary analysis using Feasible Generalised Least Squares (FGLS).

This research’s contribution to the literature is threefold. First, the study investigated how regulation, competition and stability relate to each other in the Zimbabwean banking sector. For the most part, prior studies on the competition-stability/fragility nexus in Zimbabwe investigated either efficiency and stability or competition and stability, with no study incorporating regulation. Second, we measure competition from both the deposit and loan side which gives us a more direct measure of competition as compared to other methods of measuring competition (i.e., concentration measures) since we can calculate competition at the individual bank level. In addition, this methodology captures different dimensions, most banks in Zimbabwe recorded high non-performing loans so it is necessary to determine if these high NPLs are connected to the level of competition in the loan market. Furthermore, the regression analyses the stability of different types of banks (commercial banks, building societies and a saving bank).

The research has a number of policy implications. It suggests that competition-regulation policy should be revised and applied based on the economic circumstances the Zimbabwean banks will be operating under. The financial crisis led to a re-examination of risk

assessment practices and regulation policies which focus on the risk of an individual bank's contribution towards systemic risk. The findings support this transformation since the results show that commercial banks and the savings bank (POSB) perform worse than Building Societies (BS) so investigating each bank's risk profile is vital.

The remainder of the paper is structured as follows. Chapter 2 discusses the theoretical background and chapter 3 outlines the empirical literature. Chapter 4 describes the methods, procedures and techniques. Chapter 5 details the empirical results of the study and Chapter 6 concludes.

CHAPTER 2

THEORETICAL LITERATURE

2.1. Introduction

Banks have a special status because of important characteristics mainly from their asset side and liability side. On the liability side, people may hold some non-negligible share of their wealth in the form of bank deposits. Banks offer a vital service to these depositors by pooling these short-term deposits and investing them in long-term loans (Levine, 2003). On the asset side, banks are responsible for assessing the viability of projects presented by entrepreneurs before they grant loans to them (Meyer, 2016). Banks compete for both loans and deposits and they have an additional role in providing liquidity. Moreover, focusing on the wholesale side, banks are heavily involved in interbank lending among each other to cover daily liquidity shortfalls. Thus, banks are strongly linked to each other; hence the speciality of the banking system from the perspective of financial stability is a widely recognised issue (Xian-Shen *et al*., 2018). For the aforementioned characteristics, the banking system is carefully regulated since in the absence of proper safety provisions, there is a possibility of one bank's crisis propagating to other banks and creating systemic risk (Brunnermeier and Cheridito, 2019). The vulnerability of banks presents a motivation for various regulations and supervisory activities in this sector which have to be taken into account when analysing bank competition and bank stability. Time and resources have been directed towards theoretical studies on bank stability, competition and regulation, some of which will be discussed in this chapter.

The rest of the chapter is organised as follows: The review of related theories underlining the competition, stability and regulation nexus are discussed in subsections. A review of theories underlining regulation and competition is in section 2.2; the competition-fragility view is in section 2.3 while section 2.4 discusses theories on the competition-stability view. Section 2.5 concludes.

2.2. Regulation and competition

It is believed that bank regulation influences bank competition which shapes stability (Noman *et al*., 2018). The nexus of bank regulation, competition and stability as first presented by Keeley (1990) argued that deregulation initiated by supervisory authorities increased competition which eroded banks' profits and charter values, worsening risk-taking behaviour by banks. Bank regulation is meant to mitigate risk-taking behaviour and bolster a stable

banking sector. Concerns for a stable banking sector led to several regulation activities which directly or indirectly affect the level of competition in the banking sector. Supervisory authorities play a role in influencing the level of competition that exists in a banking system since for a bank to operate in a country; it requires a special licence which is issued by the supervisory authorities (Didenko *et al*., 2018). Furthermore, under the failed bank resolution process, instability which is caused by failing banks is often solved by bank mergers and supervisory authorities play a coordinating role in bank merger reviews and approvals (Vij, 2019). Also, regulators set capital adequacy requirements and stipulate safety nets for depositors in the form of deposit insurance (Jumreornvong *et al*., 2018). The above are some of the regulatory policies that will eventually affect the number of banks in a banking sector hence bank competition. Therefore, the above enforcements question to which extent must these regulation policies be applied in banking. As sometimes argued that excessive competition is harmful to bank stability, if this hypothesis is proved to be true, then regulatory policy should follow stringent criteria which restrict competition. The economic rationale for this will be addressed in greater depth below.

2.3. Competition-fragility view

Academic interests in the relationship between bank competition and stability were triggered by the work of Keeley (1990). A strong claim was made in this publication which tinted excessive competition in the banking sector to be a plunge to be avoided. His findings report that various deregulation measures at least partly caused a surge of bank failures in the United States during the 1980s. In this period, the loan market was characterized by excessive risk-taking by banks as a response to the intense competition which eroded their cost advantage and profits. This school of thought was termed the competition-fragility view which is a notion that excessive competition in banking can lead to bank failures, panics and bank runs which are undesirable consequences (Allen and Gale, 2000; Keeley, 1990; Marcus, 1984).

Part of academic literature has indicated a possible negative relationship between bank competition and bank stability (Allen and Gale, 2000; Keeley, 1990; Marcus, 1984). This notion highlights that a trade-off between competition and stability exists. Legislative reforms have been in support of the competition-fragility view by implementing reforms which restrain competition. As competition declines, banks benefit as rents in the loan markets increase since they can charge higher loan rates with minimal customer switching. Additional positive results of less competition include higher bank charter values and lessened risk-taking behaviour by

bank managers. These are further discussed in the sub-sections below.

2.3.1 Charter value argument

A high charter value is a source of monopoly power. The charter value is the net present value of future rents. It indicates the value that would be lost in case of bankruptcy; hence it represents the bank's private cost of failure (Acharya, 1996). Therefore, banks' charter value self-disciplines bank risk-taking. An increase in competition is associated with a decrease in a bank's charter value and is associated with an increase in risk-taking behaviour by banks (Allen and Gale, 2000; Goetz, 2018; Keeley, 1990). This is evident from banks which have more market power and can build monopoly rents hence they have higher charter values. These banks are observed to act rationally because the higher charter value they hold deters risk-taking behaviour. They are aware of the opportunity cost that is associated with going bankrupt. So, since banks with market power have high charter values, which only arise when competition is low, most economists argue against opening up the banking sector to competing banks as it hurts profits and as a consequence, charter value declines (Danisman and Demirel, 2019; Goertz, 2018).

2.3.2. More risk-taking behaviour and increase in NPLs

A decline in charter value yields incentives to take on more risk which will induce the probability of default. In light of an increase in bank competition, banks may loosen acceptance criteria and grant loans to not suit borrowers all in the urge to attract more demand for loans (Arping, 2019). Berger and DeYoung (1995) state that "Virtually all research on the causes of bank and thrift failures find that failing institutions have large proportions of non-performing loans (NPLs) before failure". Several researchers have found that failing banks tend to be located far from the best-practice frontier; in addition, they have high ratios of NPLs and tend to be cost-inefficient (Assaf *et al*., 2019; Becher *et al*., 1995; Berger and Humphrey, 1992). The literature also suggests that financial deregulation increases the degree of competition in the market, which thereby induces bank managers to undertake imprudent risks. Berger and DeYoung (1995) outlined four hypotheses which care to explain the intertemporal relationship among the competition, risk-taking and NPLs namely bad luck, bad management, skimping and moral hazard hypotheses.

2.3.2.1. Bad luck

The bad luck hypothesis is about an adverse external (system-wide) event which is

beyond the control of a bank (Shuman, 2015). Different events may exogenously affect a bank's efficiency both favourably or unfavourably. An external event such as when a new bank regulatory policy is implemented, for instance, an increase in the minimum capital requirement; it may unfavourably affect a bank's operations. Evidently, the banking industry experienced a bad luck factor in the 1970s and 1980s in the form of increased competition. In the 1970s and 1980s, legislative and institutional developments were relaxed and this permitted greater competition (Jiang *et al*., 2017; Park, 1994). This period was characterised by many states relaxing their restrictions on bank ownership by foreign entities. Furthermore, the introduction of the Depository Institutions Deregulation and Monetary Control Act of 1980 (DIDMCA) which lifted restrictions on deposit houses and allowed them to offer Negotiable Order of Withdrawal (NOW) accounts added competitive pressure on banks. During this period, there was a deterioration in bank asset quality and high NPLs. The next hypothesis, the moral hazard hypothesis explains this.

2.3.2.2. Moral hazard

The moral hazard hypothesis is when two parties, investors and managers have conflicting interests. The Economic Times (2013) defines moral hazard as "the lack of incentive to guard against risk where one is protected from its consequences." It's a classical problem of excessive risk-taking when another party is bearing most of the risk and cannot easily prevent that risk-taking. Tanzi (2018) refers to the economic theory of asymmetric distribution of knowledge where a few knowledgeable people dominate an ignorant many arising from imperfect competition. Reference is made to a situation where 'termites are allowed to breed' when these few dominant people enter the markets and exploit profit opportunities at the cost of beneficial regimes. There is little to nothing that regulatory entities can do to shelter the minority from the vested motives of the majority, a good example is the failure of Lehman Brothers in 2008. A cancerous regime of moral hazard in the financial system arose as the bank considered itself "too big to fail". Banks which were considered large had tolerance for high-risk loans which would probably result in bad loans based on an expectation they will be bailed out in case of trouble. The result was what is referred to as Lehman Brothers' demise as the bank went bankrupt, which pushed the world very close to the brink (Graduateway, 2018). Also under the moral hazard hypothesis, it is assumed that low-capitalized banks have a greater incentive to take more risky projects on loan portfolios because they have relatively less to lose in the event of default. An increase in competition which can be a source of bad luck under the bad-luck hypothesis can lead to impaired capital levels and a

decrease in banks' charter values. Bank managers in poorly capitalised banks are less risk averse and tend to shift risk to the creditors and in case of bankruptcy, the loss is normally borne by depositors as high non-performing loans in the future are a result which challenges the recuperation of depositors' funds. Increased competition and financial openness influence moral hazard incentives as banks hold both low capital and charter values (Park, 1994; Luo *et al*., 2016). Under the moral hazard hypothesis, we would expect a negative relationship between capital adequacy/charter value and risk-taking, low financial capital will Granger-cause high problem loans/NPLs. (Gunther and Robinson, 1990).

2.3.2.3. Bad Management

The bad management hypothesis is when top management engages in activities which will not add value to the bank. When a bank's costs are too high, it is a sign of poor senior management practices since they have to implement cost-efficient decisions (Berger and DeYoung, 1997; Shuman, 2015).

The managerial ability helps a bank's efficiency, competitiveness and agility. Depositors assume that bank managers make decisions which maximize their wealth and that they are competent and loyal to them. That is, they will practice adequate loan underwriting; monitoring and control to avoid default on loans (Banna *et al*., 2016). However, the incentive of bank managers may differ from that of outside shareholders such as depositors. Expected future earnings could be at the core of a manager's interests when making decisions such as granting loans. So, when a loan with high risk and high expected profit is presented, managers may not act in the best interest of depositors (Stulz, 2015). Consideration to grant the loan will be based on the expected future earnings of the bank's managers regardless of the level of risk. It is quite possible for bank managers to be incompetent and this disregards the assumption that managers are more well-informed than depositors about the earnings of prospects of entrepreneurs. These incompetent managers' characteristics include poor skills in credit scoring, ineffective cost controls and unwise investment choices (Central Bank of Kenya Annual Report, 2004; Karim *et al*., 2010). This may lead to incompetent managers adopting extremely risky strategies with high-profit prospects to keep their jobs longer but at the cost of an increase in NPLs.

2.3.2.4. Skimping

The skimping hypothesis is when a bank shifts present costs to the future to appear profitable now (Chaibi, 2016). Being cautious about lessening the occurrence of bad loans comes at a price. The bank management will have to hire (if they do not have already one) a

person who is experienced in credit screening so that when issuing loans, they are made to the right people. There are additional costs associated with monitoring the borrower after the deal has been sealed.

Some managers cut the number of resources allocated to underwriting and monitoring loans to cut short-term operating costs. They face a critical decision to trade off short-term operating costs to maximise long-run profits by skimping on resources meant to be devoted to appraising collateral, controlling, monitoring and underwriting borrowers. The costs are reduced to make the banks appear cost-efficient in the short-term (Abel, 2018; Berger and DeYoung, 1997). Banks bear the consequences of worsened asset quality in the future and increased costs in the future as they have to deal with these lagged values of NPLs. As time passes, the inattention to the loan market becomes apparent as some borrowers become delinquent. After the loans become past due, additional costs are incurred as managers have to allocate additional resources toward monitoring bad loans.

These four hypotheses are not mutually exclusive. In extreme cases, all four hypotheses could simultaneously affect the same bank. For example, bad luck could strike a poorly managed bank run by incompetent managers who also happen to be skimping on loan monitoring expenses (Berger and DeYoung, 1995). Loss of capital as a result of the combined bad luck, bad management, and skimping hypotheses might lead to the bank responding through the moral hazard and taking increased risks.

2.4. Competition-stability view

A more recent strand of theoretical and empirical literature proposes that stronger competition does not necessarily cause instability in the banking sector. The competition-stability view posits that more competition in the banking sector results in more, rather than less, stability. When there is less competition, there will be a substantial increase in the size of some banks and they earn market power, monopoly rents and higher charter values. This creates a too-big-to-fail policy which increases the moral hazard problem as they know they are likely to be completely protected by the government if they fail. A market with high competition curbs the problem of too-big-to-fail which is associated with market power as increased competition erodes banks' market power (Mishkin, 1999). Moreover, when banks have less market power, they will charge lower loan rates, which may induce borrowers to monitor their investment risk hence they are less probable to default on loans (Boyd and De Nicolo, 2005). Overall, the competition-stability view is welcoming to an increase in

competition based on the expected benefits discussed below which include efficiency gains, a cut in costs and a delivery of a better customer experience.

2.4.1. Improvement in the provision of services to consumers

Switching costs refer to costs incurred by customers when they move from one bank to another (Egarius and Weill, 2016). When there is intense competition, switching costs are low and customers are encouraged to switch banks if their bank is complacent. Switching costs are a source of market power for banks so when this cost is diminished by the entrance of new competitors, existing banks will have no choice but to respond by meeting the value delivery expectations of their clients (Rahi and Ghani, 2016).

What clients consider when deciding on which bank to open an account with has greatly changed from the traditional banking services (Devlin, 1995; Gill *et al*., 2015). Improved engagements yet at a reasonable cost and banking made easier are some of the top qualities that clients are looking for in a bank. Being aware of this, most banks have warmed up to the idea of running incubators and fintech to strategically partner and work with them in service delivery (Naveretti *et al*., 2017). Banks compete to give their customers the best experience through a contextual customer experience such as the easiness of transaction, credit scoring and new account opening. Banks strive to be the top supplier of real-time contextual banking engagement with their clients.

2.4.2. Improvement in financial innovation

Bank competition can be beneficial as it stimulates innovation. An increase in competition makes banks compete in unique areas such as digital transformation and technological innovation (Cuesta *et al*., 2015). Digitalization of banking is moving quickly with many options available. New business models in banking are emerging and consumer expectations are increasing. To survive in the market, a bank has to come up with a strategy and among these are a new digital banking model, innovation trends and digital transformation.

An increase in competition has seen banks increase their investments in innovation. In their budgets, there is a greater proportion allocated towards spending on innovation. Banks are thinking smart and considering a digital-only bank system through digital transformation. This is to offer a seamless omnichannel experience without a link to a physical channel and that would be both time and cost-savvy to the customers (Al-Hawari, 2005; Zhou *et al*., 2019).

2.4.3. "Quiet life" hypothesis

When there is less competition, banks existing in the market will benefit from monopoly profits. The quiet life hypothesis postulates that these profits arise from a large interest rate margin between the interest rate on loans and the interest rate on deposits. Banks can exert abuse of dominant position and this relates to any anti-competitive behaviour practised by one or more banks which are in a higher position and exploit such market advantage to improve their gains (Asongu and Odhiambo, 2019). An example is when banks charge higher interest rates on loans and pay relatively lower deposit rates, hence generating high profits. Bank managers will have no incentive to operate efficiently. Thus, this hypothesis proposes a positive link between competition and stability. An increase in competition is good since as new entrance enters the market, the monopoly profits will be exhausted (Rossazana, 2016).

2.4.4. Improves access to funds

Small, medium and large firms are affected differently by constraints to credit. The assumption is that large firms will have better access to funds since they have more value in the collateral. Beck *et al*. (2003) explored the impact of competition on small, medium and large firms' access to funds in 74 developed and developing countries. Their findings confirm the assumption as the negative effect less competition has on access to credit increases as we move from large to medium to small firms. Firms in countries where there are few banks in the industry report higher financial constraints. Hence intense competition will be expected to improve the situation.

2.4.5. Improves efficiency

Competition can foster stability through the beneficial effect on bank efficiency. To curb loan default risk, banks have traditionally relied on relationship lending. Tight regulation of banks has led banks to be more innovative in ways which cut costs and make the most of the limited resources they have (Gharsellaoui, 2015). The odds of a competitive environment favour an efficient bank. Competition is associated with an increase in failures of inefficient banks. As competition intensifies, weaker banks are pushed out of business as banks compete for both deposits and loans. Banks worldwide have been pushed to improve their resource allocations. To survive, banks are moving to credit scoring, this method cut costs as banks will solely depend on the information that is publicly and easily accessible. Hard information such as borrowers' repayment records, outstanding debt and collateral value is used to calculate a score that ranks their riskiness. The data is recorded numerically so with ease banks can

automate it and use it to screen loan applications. Hence banks lower costs associated with screening and can be time savvy (Berger and Udell, 2002).

2.4.6. Improves capitalization levels

Compulsorily as required by the central banks, or at their own will, banks hold excess capital as a buffer to protect depositors' money. Since banks publicly release their financial statements, depositors will be highly choosey with whom they hold their excess funds with more especially in times of heightened instability. So, they take measures to check which bank holds a sufficient level of capital, just in case it goes bankrupt and their deposits have to be paid back from that bank's excess capital account. Generally, high capital levels attract funds and maintain long-term customer relationships (Allen *et al*., 2011). When competition in the banking sector increases, competition for deposits also increases. Schaeck and Cihak (2010a) and Allen *et al*. (2005) studies on the relationship between competition and capitalization level show that to attract borrowers in a period of high competition, banks are induced to hold more capital. This creates a buffer against default, and it contains the effects of instability.

2.5. Conclusion

There is a possibility that bank competition and stability are non-linear. An increase in competition will enhance these factors that drive stability only to a certain optimum level. As competition increases beyond this optimum point, a U-shaped relationship between competition and stability is obtained. Martinez-Miera and Repullo (2010) study touches on this as their study found support for both the competition-stability view and competition-fragility view. Lowered loan rates that are a result of an increase in competition can be a two-sided sword. Accordant with Boyd and De Nicolo (2005) findings, more competition lowers loan rates which will in turn lessen the probability of loan default hence safer banks. However, lower rates imply that the buffer against loan losses is lost as lower revenues are yielded from performing loans, resulting in less stable banks.

Historical analysis which compares the analysis of different countries and study periods comes to different results. For example, analysis of the competition-stability nexus for the middle of the twentieth century when the United States of America's banking system was engulfed by instability; other nations' banking systems such as Canada had efficiency and stability (Bordo *et al*., 1996). Therefore, it is hard to draw any firm conclusions on the effects of changes in market structure and competition on stability. The conclusion drawn is that competition-stability aspects are extremely case-dependent. Adequate regulatory policies need

to be put in place which would mitigate any trade-off between competition and stability, and they should be country specific.

CHAPTER 3

EMPIRICAL LITERATURE

3.1. Introduction

Quite a substantial amount of work has been done on the regulation, competition and stability relationship. Historically, regulation has been measured in terms of the safety and soundness of the banking system as well as corporate governance on the conduct of banks operations. Regulation has been debated in the banking sector and the events leading to the 2007-2008 financial crisis have increased attention to bank regulation across the globe (Duffie, 2016). Certain reforms have been suggested to affect competition either positively or negatively as they shift the market structure and level of competition in the sector. Reforms such as financial liberalisation, approval of mergers, and stringent capital requirements have been at the forefront of the empirical literature on the effect regulation has on the stability-competition relationship (Al-Muharrami, 2019; Claessens and Laeven, 2004; Demirguc-Kunt *et al*., 2016). For instance, stringent capital requirements can constitute a barrier to new entrants in the banking sector thus restricting competition, therefore the market will be more concentrated. The impact concentration has on bank competition and hence on stability is taken over by some empirical studies which find evidence in support of either the competition-stability view or the competition-fragility view (Degl'Innocenti *et al*., 2018, Hakenes and Schnabel, 2011; Schaeck *et al*., 2009; Yahaya *et al*., 2015). However, some studies postulate support for both views in their findings (Fu *et al*., 2014; Berger *et al*., 2009; Nguyen *et al*., 2017; Jimenez *et al*., 2013). Though not enough work has been done in this regard, nevertheless, there seems to be some consensus on the effects of regulation but the direction thereof is far from reaching a consensus. The next section enquires about what has been known about competition and stability and the place for regulation.

3.2. Global Empirical Literature

3.2.1. Empirical tests of Regulation and Competition

Al-Muharrami (2019) investigated the market structure of the Oman banking industry. What prompted this analysis was the high number of requests by banks in the nation to merge. So, his study tried to answer whether the approval by the government of such requests is good for both the industry and the economy. The study used the Herfindahl-Hirschman Index (HHI) and the Concentration Ratio (CRk) to measure how concentration has evolved in the sector during period 1998-2014. The indicators showed a decreasing trend since 1998, HHI was 2864 points with CR (2) and CR (3) of 67% and 85%, respectively. However, in 2014 the figures were lower; CR (2) and CR (3) were recorded as 52% and 65% respectively while HHI was at 2112 points. Still, the results show that Oman's banking sector is highly concentrated though there has been an improvement towards moderate concentration. These results played a vital role in advising the government on making the final decisions on requests for mergers between banks in the future. The shape of the market structure presented suggests that the central bank in Oman should be careful in granting mergers as big banks may exercise monopoly power and charge higher interest rates on loans which lead to scarcity of credit for people and firms, slowing down economic growth.

A study with a similar intention of investigating bank mergers was done in Indonesia by Yuanita (2019). Due to the expectation of an increase in banks' economies of scale arising from mergers, the Indonesian central bank had been encouraging banks to merge. In the sample, 93 banks were used and the data set was from 2000-2015. The market structure was analysed by the HHI index and CR (4) and Return on Assets was employed to measure profitability. The results differ from Al-Muharrami (2019) study which is discussed above as the results provide support for the central bank's policy which encourages mergers. CR (4) was a better indicator as it showed a negative and significant relationship with profitability. Contrarily, the HHI had a positive relationship with profitability but was insignificant. As banks merge and form bigger banks, higher economies of scale are achieved, and the banks will have lower marginal costs.

Claessens and Laeven (2004) found that banking sectors in countries that had fewer barriers to entry and were welcoming to foreign banks were more competitive. These results found evidence supporting the contestability hypothesis as contestability on local banks by foreign banks was found to affect competition. Concerning the competition-efficiency relationship in 12 European countries during the period 1994 to 1999, Weill (2004) who

utilized yearly Tobit-based estimates of the H-statistic established a negative relationship between competition and efficiency. This was a result of most countries in this region e.g., Spain, operating under a decreasing trend of monopolistic competition which indicates an increase in competition in this region.

In Malaysia, it was determined that market structure influences profitability (Katib, 2004). To reach this conclusion, a panel of 20 domestic commercial banks' data was used to analyse the sector for the period 1989-1996. Contrarily, Seelanatha (2010) found no evidence to show that market structure and market shares are significant variables in banks' performance and profitability. Rather, this study on Sri Lanka's banking sector shows that bank profitability depends on efficiency, which is an endogenous variable for each bank. Moreover, Sahile *et al*. (2015) study on 44 Kenyan commercial banks from 2000-2009 shows that profit-maximising banks are also the most efficient. This suggests that a bidirectional Granger-causality relationship might exist between profitability and efficiency.

It has been argued that regulation, especially capital regulation, plays a pivotal role in determining the relationship between competition and stability. According to Delis *et al*. (2011) most regulations in banks have largely taken the form of a capital base relating to the first pillar of Basel II namely, capital requirements (CAPR). The bank risk-regulation nexus has literature which suggests that regulation and its enforcement are responsible for shaping the performance of banks (Barth *et al*., 2007).

Capital held by banks is suggested to form a buffer in case of a shock to a bank's balance sheet (Berger, 1995). A study on 39 commercial banks in Kenya for the duration of 2000 to 2015 by Kiemo *et al*. (2019) found a positive relationship between an increase in regulatory capital levels and the Zscore index, a measure of bank stability. This was attributed to the fact that as regulatory capital increases, it boosts capital buffers hence banks are less likely to experience financial instability. These results mirror results obtained by Korbi and Bougatef (2017) study of Islamic banks and Giesececke *et al*. (2016) study on 100 Australian banks. Both studies found a positive and statistically significant link between capital adequacy and commercial banks' stability. Additionally, both studies suggest that regulatory capital is a primordial factor that reinforces the soundness of banking sectors.

More empirical studies provide support for the stabilising effect of bank capital. Demigurc-Kunt *et al*. (2010) study on international banks before the 2007-2009 crisis found a positive relationship between banks' capital ratios and stability. Capital adequacy is important

to ensure sufficient capital to avoid bank runs and also to maintain bank solvency (Dermine, 2013). A similar positive impact of bank capital on the probability of banks' survival was identified by Berger and Bouwmann (2012) study on the US banking industry. Hakenes and Schnabel (2011) argue that stringent capital requirements can hurt bank stability because they influence competition as it may not be suited to all circumstances. Stricter regulation favours bank stability during non-crisis periods.

In times of a systemic banking crisis, stricter regulation may lead to a greater reduction in stability (Hakenes and Schnabel, 2011). Barth *et al*. (2002) study shows that higher levels of non-performance loans (NPLs) are associated with the presence of more powerful government supervisors. The negative effect of strict regulation on growth is suggested to channel through Berger and De Young (1997): "bad management", "skimping", "moral hazard" and "bad luck" hypotheses. In crisis periods, ("bad luck") in the form of an increase in competition may stifle monitoring incentives by banks' managers as they take on risky projects with the attendant likelihood of failure ("bad management" and "moral hazard"). Barth, Caprio and Levine (2004) found that non-performing loans are negatively related to stringent capital regulations. Central banks will react to the effects of bad management by increasing capital requirements figures since the more stringent the regulation, the fewer non-performing loans a bank has. Stringent capital regulations reduce the amount of credit available and may increase the incentives for banks to provide funds to firms with which they maintain lending relationships. This is to reduce near-term costs by cutting underwriting, monitoring and controlling costs of the borrower to increase long-term profits ("skimping"). Only for these deferred costs to occur in the future as bad loans require servicing (Lundtofte *et al*., 2016). This highlights how bank regulation policies meant to promote efficiency spiral inefficiency in the system.

The increase in the regulation of banks across the globe affects the profit margins of banks as evident in the United Kingdom in 2013 when major banks lost 40% of profits because of regulatory fines and redress of customer provisions (Reenen, 2013). As a coping mechanism, some banks invested funds in less regulated institutions such as shadow banks. Even though shadow banks are beneficial as they provide alternative sources of credit, they are considered to be a major source of risk and instability in the financial sector by bank regulators (Meeks *et al*., 2017). Hence, the Financial Stability Board (FSB) serves to impose restrictions and capital requirements as some of its tools to control the banking system.

Empirical results indicate that there is a strong association between regulation and

competition hence the aftermaths of either an increase or a decrease in competition are funnelled by regulation. We show that overall capital stringency regulation has a direct bearing on the competition. When banks are required to have more capital, it creates a barrier to entry which limits the number of new entrances in the banking sector. Bank mergers are another determinant of competition as it influences the number of banks. The effects of a change in competition vary but two outcomes that literature seems to form a consensus on are that the effect is either positive or negative.

3.2.2. Empirical tests of the Competition-fragility view

Competition is usually regarded as an indispensable force because it triggers innovation and efficiency (Degl'Innocenti *et al*., 2018). Literature that finds support for the competition-fragility view disregards this issue of benefits derived from competition. The competition-fragility view supports stringent capital requirements, mergers and restrictions on banks' activities such as on interest rates as they foster stability. In systems where banks are cushioned by restrictions on entry, banks have better profit opportunities hence fewer incentives to take aggressive risks (Liu *et al*., 2012).

Kasman and Kasman (2015) studied the influence of banking competition on the stability of Turkish banks from 2002 through 2012. Boone indicator and Lerner index were used to measure the competitiveness of banks. To capture stability, two measures were used which are non-performing loan ratios and Zscore. A negative correlation between bank competition and the non-performing loans ratio was established. A positive correlation between bank competition and the Z-score was identified though. The results are in support of the competition-fragility view. Banks' risk-taking behaviour is influenced by an increase in competition within the sector. Keeley (1990) explains it in the context of an extreme case of perfect competition when banks' profits are zero. The observation is that there is an extension of credit to many clients since banks will be unafraid to lose anything.

Hellmann *et al*. (2000) present a theoretical model which shows that if competition erodes the bank's charter value, banks decrease capital-to-asset ratios and increase asset risk. Keeley (1990) provides empirical evidence supporting this hypothesis: the liberalization of branching restrictions and multi-bank holding company expansion laws in the US hurt banks' charter values. The conclusion reached veers towards the view that increased competition diminishes charter value hence more bank risk-taking. Similarly, Dushku (2016) empirically tested the relationship between bank competition and bank risk in Albania for the period 2004-

2014. Using robust least square methods, the paper found evidence to confirm the competition-fragility view. Total loan risk was confirmed to be lower in periods of higher market power.

Degl'Innocenti *et al.* (2018) used a large sample of investment banks from seven developed countries (i.e., Japan, the United Kingdom, France, the United States of America, Italy, Switzerland and Germany) to formalize the relationship between market structure and risk. The database covered the period 1997-2014 and a panel VAR approach was employed. The results provide some evidence to support the competition-fragility view, banks' response to a change in competition encompasses a negative and significant relationship between risk and competition.

Akande *et al*. (2018) conducted a panel analysis using commercial banks' data in 37 Sub-Sahara African region countries to investigate how the relationship between competition and banks' off-balance sheet risks manifests. The risk was proxied by i) loan loss provision to gross loan ratio ii) off-balance sheet obligations to assets ratio iii) loan loss provision to equity ratio iv) capital to asset ratio and v) off-balance sheet obligations to equity ratio. The Lerner index was the only proxy of competition applied. A GMM model was estimated. Their results provide evidence in support of the competition-fragility view. They found that over the study period from 2006 to 2015, a competitive banking environment relates positively to risk. Secondly, the manifestation of risk especially through losses in charter values and risk-taking behaviour in loan portfolios is the major cause of fragility in a competitive banking environment.

This view postulates that the relationship between bank competition and bank stability is that more of the former undermines the latter. Erosion of market power, with the decrease in profit margins, reduces banks' charter values, hence the penalty for failure, inducing riskier choices (Kasman and Kasman, 2015; Akande *et al*., 2018; Hellmann *et al*., Murdock and Stiglitz, 2000).

3.2.3. Empirical tests of the competition-stability view

The competition-stability view argues that restrictions may lead to rent-seeking and might prevent banks from reaping necessary diversification and scale benefits. Studies which find results to support this view mainly postulate that competition promotes stability as it affects banks' profitability, efficiency, cost of credit and access to credit (Zhao and Murinde, 2011; Nabieu, 2013 and Schaeck *et al*., 2009).

Akande and Kwenda (2017) investigated the transmission from competition to efficiency to stability in the Sub-Saharan Africa region. The study intended to test how far efficiency is associated with a competitive banking environment. Panel data of 37 SSA countries' commercial banks were analysed for the period 2006 to 2015. An exogenous instrument variable of competition was generated by employing the Stochastic Frontier Analysis (SFA) approach. The bank-level competition was estimated using the Lerner Index and stability was proxied by the zscore. This competition variable was regressed against stability using GMM. The results provide answers to the role of competition in the stability of the SSA region. Policymakers in the SSA region are to harness the gains of competition according to this study's results because a strongly significant and positive relationship was established between the instrument of competition and stability. Also, efficiency scores generated from the SFA show a positive association between an increase in competition and efficiency. The conclusion reached was that competition is beneficial as an affirmation of transmission from competition to efficiency and then to stability was found.

Akande *et al*. (2019) simultaneously analysed the interplay of competition, regulation and stability in panel data of Sub-Saharan African countries. SFA was used to generate an efficiency score, the Lerner index was applied as a measure of bank-level competition, the z-score was included as a proxy for stability and the ratio equity to capital (ECR) was the regulatory variable. The relationship was modelled using Structural Equation Model (SEM). They found interesting Granger-causality mediating paths where capital regulation causes competition, which results in efficiency and improves the stability of the bank system. The results also provide evidence to substantiate some of the views in the literature relating other regulatory variables besides capital regulation, to competition and stability. Other regulatory variables (asset quality and liquidity) both had causality on efficiency and stability. These findings have an impact on how policies should be crafted as the results suggest that besides competition and capital regulation, efficiency and other regulatory measures must be incorporated in addressing stability issues.

The Nigerian banking sector has been an area of interest for scholars as the economy saw stiff competition that followed measures taken by the government through unprecedented financial sector reforms. Zhao and Murinde (2011) looked at the interrelationship among risk-taking, bank competition and productive efficiency during the banking reforms that occurred in Nigeria during 1993-2008. They found a negative relationship between bank risk-taking behaviour and competition. Deregulation in the form of interest rate and adaption of foreign

banks encourages banks to take on less risk and enhances bank productive efficiency as prudential regulation leads to increased competition. Furthermore, their result supports competition as it is associated with the benefit of a well-functioning banking sector as banks behave more prudentially in light of an increasingly competitive environment.

In another Nigerian bank system study, Ajisafe and Akinlo (2014) examined the trends in competition and efficiency from 1990-2009. Secondary data was collected from 15 commercial banks' annual reports which were analysed using pooled least square and dynamic panel generalized method of moment estimation technique with fixed effects. Their results feed into the prior expectation of a positive relationship between the two variables. As competition increases, the profitability of the banks also increases which would amount to an increase in the level of efficiency. Yahaya *et al.* (2015) tested whether they can find support for the competition-stability view in the Nigerian banking sector. They focused their study on how changes in the competitive environment affect bank performance. Their sample included listed deposit money banks for the time horizon from 2005 to 2014. Their results validated the competition-stability view as they found a negative correlation between market share and financial performance.

Chirwa (2003) applied cointegration, a Vector Error Correction Model (VECM) in Malawi to test the relationship between profitability and concentration in the commercial banking sector. A positive relationship was established, the more participants in the sector, the more profits banks make. Similarly, Nabieu (2013) study signifies a strong acceptance of the competition-stability view in Ghana's banking sector as his study is in support of the Structure Conduct and Performance (SCP) hypothesis which suggests that there is a positive relationship between market competition and a bank's profit.

Mlambo and Ncube (2011) studied South African banks to examine the influence between competition and efficiency. The study was implemented for the period 1999-2008 using the Panzar-Rosse approach to deduce the H-statistic which captures competition. Efficiency was measured using the Data Envelopment Analysis (DEA) methodology. The study determined that South African banks were operating in a monopolistic competitive environment as the sector was dominated by five banks which together accounted for 85% of the sector's assets. In relation to efficiency, the study results complement the competition-stability view as the number of efficient banks was falling due to the lack of a competitive environment. Inefficiency was yield in the sector as big banks tend to avoid outright competition against one

another hence competition is necessary.

Schaeck *et al*. (2009) studied whether concentration and competition lead to banking crises. They used the Panzar-Rose to gauge competition using data from 45 countries and the duration model to measure the probability of observing a time until a crisis. This study for the period 1980-2005 concurs that the competition-stability view as they found that an increase in competition leads to a reduction in the likelihood of a financial crisis occurring. The effect of concentration was also found to be negatively related to stability providing suggestive evidence that low concentration contributes to a decrease in the probability of banks running into crises hence an increase in survival time of banking sectors.

The studies' results show that lower market power, low concentration and henceforth less competition in banking decreases the risky behaviour of banks, confirming the "competition-stability" view. The main arguments are based on the risk-shifting effect and the doctrine of "too-big-to-fail." Larger banks are more likely to be inefficient and increase financial fragility through risk-taking behaviour that is encouraged by the belief they are too large to fail and policymakers are likely to "save" them in the case of bankruptcy.

3.2.4. Empirical tests of the U-shaped relationship between competition and stability

Some, but relatively fewer studies found evidence of the existence of a U-shaped relationship between competition and stability. Using the information on 14 Asia Pacific banks by Fu *et al*. (2014) to investigate whether there is a trade-off between competition and stability, the results verified both the competition-fragility and competition-stability views. The Concentration Ratio (CR3) coefficient used to measure bank concentration had a significantly positive relationship with bank fragility indicating that banks operating in an environment with high concentration face more risk hence an increase in fragility. This is not a surprising result as banks in the Asia Pacific are the biggest source of public savings (Sheng, 2009). Hence, the existence of protected, large banks is common in this region which channels "too large to fail" and hence banks lose interest in promoting a healthy credit culture. However, when the Lerner index was used, there was evidence in support of the competition-fragility view. The results indicated a significant negative correlation between the Lerner index and bank risk. As banks in Asia gain more monopoly power, the degree of their pricing power increases hence higher profits and this is associated with an increase in stability for each bank. As indicated in Berger *et al*. (2009), the results do not necessarily have to always yield contrasting predictions with

regard to the relationship between competition and stability.

Martinez-Miera and Rebullo (2010) capture both the margin effect and the risk-shifting effect allowing for an imperfect correlation of loan defaults. When the charter value of banks is eroded due to an increase in competition, banks can be induced to take more risk according to the risk-shifting effect. This contributes to instability. However, as competition increases, banks may charge lower rates to borrowers; incentivizing them to choose safer investments hence the initial risk is offset. The margin effect contradicts these results for it takes into account how lower rates will reduce banks' revenues from loans. When this latter effect is taken into account, a U-shape relationship between competition and bank failure/stability may result. Jimenez *et al*. (2013) study on the Spanish banking sector finds support for this non-linear relationship using traditional structural measures of market concentration in both the loan and deposit markets.

Carlson and Mitchener (2005) examined whether branch banking was responsible for the reduction in bank failures in the 1920s and 1930s in America. The study's results were consistent with some literature that found international financial liberalization to result in reduced volatility. They found that branch banking was beneficial as weak banks were weeded out of the system as competition increased. However, they found that this beneficial result of more stability was reaped in the long run. Initial turbulence in the financial sector is experienced when legal barriers to entry are removed, increasing competition. Over time, this is smoothed out as weaker banks either voluntarily liquidate or merge with more stable banks serving the whole sector from massive failures that could have followed.

Incorporating market, regulatory and institutional features into the relationship between bank competition and bank stability, Beck *et al*. (2013) study documented a large cross-country literature. They considered how the competition-stability nexus is affected by the market, institutional and regulatory environment banks operate in. Their data sample consisted of 79 countries with a mix of developed and developing countries and, most importantly, they controlled for the overrepresentation of United States banks in the pooled sample. The Lerner index was used to measure market power and the Zscore was used to proxy for stability. The results showed support for the competition-fragility view as they found evidence of a significant and positive relationship between stability and market power. As competition increases, banks lose monopoly power, and so pricing power, and they increase their risk-taking behaviour hence a detriment to stability. This result is conditional, as it is an average positive

correlation relation. The relationship had a variation over time and across countries. These variations can be explained by country-specific and time-specific characteristics for example an increase in the competition was shown to have a larger impact on banks operating in countries with excessive barriers to entry, lower systemic fragility, good credit information sharing channels and more generous deposit insurance.

The effect of competition on stability also depends on time-specific characteristics as proven by Nguyen *et al*. (2017). In their study which focused on the relationship between stability and competition of 24 commercial banks in Vietnam for the period 2008- 2016, increased competition elevates stability in the system. At the same time, in a crisis, competition led to an increase in NPLs of Vietnam banks, causing instability.

The studies find evidence of a U-shaped relationship between competition and stability. Up to a certain threshold, an increase in bank competition is associated with lower risk. Above this threshold, more competition increases risk as the positive effects of competition are outweighed by the adverse effects of rising competition. The literature has also emphasized the role of the macroeconomic environment as well as the regulatory framework in explaining bank performance, risk-taking and stability.

3.3. Zimbabwe's Banking Sector Empirical Literature

It is necessary to investigate the level of competition in the Zimbabwean banking sector after the economic meltdown during the period 2000-2008. More importantly, the economy introduced dollarization in 2009. Abel and Le Roux (2016) assessed the banking sector between 2009 and 2014. The Panzar-Rosse H-statistic was obtained to estimate the level of competition. The results indicated that there was a certain degree of monopolistic competition in the sector. The effect of this result is enhanced stability as according to Gutiérrez de Rozas (2007), sectors with monopolistic competition compete through product differentiation and banks can reap more revenue due to the uniqueness of their products. When the Panzar- Rosse H-statistics over the period were further analysed, a trend was established which shows that the Zimbabwean banking sector has evolved from monopolistic competition to perfect competition. The H-statistic rose from 0.47 in 2009 to 0.99 in 2014 (Abel and Le Roux, 2016).

Makena (2021) study examined the impact of changes in banking sector competition on stability in Zimbabwe for the period 2009 to 2017. The period of study was specifically chosen because it coincides with an era when mergers, acquisitions and closures of banks were

prominent and it is also a period marked by an increase in economic growth and stability after the Zimbabwean economy fully dollarized. The results support the "competition-stability" view since the coefficient on the Boone (2008) Indicator is negative and statistically significant indicating that an increase in competition may lead to the reallocation of profits from the hands of inefficient banks to efficient banks hence fostering stability.

Globalisation removes barriers in the area of commerce and according to the IMF (2009) it has driven the entry of foreign banks (which are relatively bigger) into developing countries, leading to highly concentrated markets. It may be beneficial as it could lead to discoveries, a broader horizon and better services. However, globalisation has a possible risk of negative shocks to the domestic market as it may cause an increase in competition and foreign banks fleeing in times of bank crises, leading to instability in the domestic market. Using 11 commercial banks, one savings bank and four building societies to obtain data, Njanike (2010) investigated the influence globalisation had on the activities, growth and soundness of the banking sector in Zimbabwe. The study designed questionnaires which targeted banking IT and marketing executives. Results show that the competition-stability view holds in Zimbabwe as globalisation had a positive effect on bank productivity. Globalisation has given rise to new ways of banking such as telephone banking, ATMs and internet banking. The increase in competition that globalisation gave rise to, proved to be vital for enhancing a healthy banking sector that promotes the socio-economic development of a nation.

An increase in competition will drive banks to compete in what Herring (2003) termed knowledge-based competition. Banks that strive to adopt distinctive competencies will have a competitive advantage which is unmatched by competitors. A study focusing on Zimbabwe by Maune (2014) tested the concept of knowledge-based competition, which is better referred to as competitive intelligence (CI) in this study. It was found that CI's role was crucial in driving product innovation, regulatory compliance and risk management. Banks that adopted the CI achieved growth and most banks have embraced CI as a result of economic challenges in Zimbabwe.

Abel *et al.* (2017) evaluated competition in the loan and deposit market in Zimbabwe using the Boone indicator. The period of study was 2010 to 2015 because interestingly, this period was characterised by an increase in issued loans, deposits and profitability. The increase in loans implied an increase in competition in the loan market and this came with banks reporting high NPLs figures. The results show that the Boone indicator for the loan market was

0, 2781 versus 0, 4950 for the deposit market meaning competition in the loan market was more intense than in the deposit market. The result gives justification to the skimping and bad management hypotheses, banks were engaging in a rapid expansion of the asset side of their balance sheets.

Effective credit risk management practices have an impact on a bank's survival. Njanike (2009) study on the Zimbabwean Banking Crisis in 2003/2004 identified how the failure to effectively manage credit risk led to the demise of over ten banks between December 2003 and December 2004. To find answers, the study made use of qualitative data which was obtained from interviews and questionnaires which were designed for bankers and senior managers of commercial banks. Many factors were highlighted by the respondents as causes of the banking crisis. The most common were weak underwriting and credit monitoring standards. Banks disregarded the set prudential lending limit hence insider loans, also banks diverted from their core business and had a strong appetite for speculative activities. This contribution relates to Berger and DeYoung (1995) study of determinants of NPLs and bad management and the moral hazard problem are some of the hypotheses.

The level of capital a bank keeps plays an important role in mitigating the effects of turbulences in the banking sector. Mbizi (2012) sought to determine how regulation in the form of minimum capital requirements influences bank performance in Zimbabwe. Twenty executives were interviewed to discuss various topics pertaining to bank capitalisation and performance. Also, a regression analysis was employed and found evidence to reject the null hypothesis that capital does not contribute positively to bank performance henceforth, a positive relationship between capital levels and bank profitability was established. Conclusions drawn from the study were that the basis for capital levels is to protect creditors and depositors, provide a disincentive for excessive risk-taking by banks and maintain bank safety.

The revision of minimum capital requirements from US$12.5 million to US$100 million by the Reserve Bank of Zimbabwe in July 2012 prompted Jabangwe and Kadenge (2014) to study the relationship between banks' performance and capital levels. The results are in discordance with those of Berger (1995) who argued that banks who hold more capital can easily adhere to regulatory capital standards. Rather, the capital adequacy variable had a positive but insignificant relationship with bank performance, hence there is no evidence to support the positive relationship intuited in Berger (1995).

3.4. Hypothesis, Restatement of the Problem and Conclusion

From the foregoing, it is clear that issues of regulation in banking have been the subject of debates both in theory and empirical works notwithstanding that the sector remains, perhaps, intensely regulated. Both the competition-stability and competition-fragility views enjoy at best mixed theoretical and empirical support in the literature. The importance of the contribution of the U-shaped relationship literature cannot be overlooked. These studies help as they care to explain why conflicting empirical results may be obtained by various studies. It shifts the focus on anticipating results to be in support of either the competition-fragility view or competition-stability view. The studies accommodate the idea that the results need not be inconsistent and that understanding the market, institutional and regulatory framework in which banks operate is equally important. In light of these arguments, we posit the following hypotheses:

1. *H_1: There is a strong association between the level of regulation in the banking industry of Zimbabwe and bank competition*

2. *H_1: There is a significant association between the level of competition in the banking industry of Zimbabwe and bank stability*

3. *H_1: There is strong interplay amongst regulation, competition and stability*

In summary, the literature advances strong arguments to support the view that increased competition leads to instability. However, a major shortcoming of most of the studies is that the majority of these studies were predominantly based in Europe, emerging markets and the United States; however, they are scarce, if not non-existent in Zimbabwe. Additionally, there is a gap in knowledge in the Zimbabwean banking sector as none of the literature has studied the interconnection among competition, regulation and stability. This thesis sought to fill this gap in the literature and the implication is to analyse the interplay among regulation, competition and stability simultaneously. Thus, enhancing the investigation as to how regulation, in addition to the competition- fragility/stability views, influence the competitiveness of banks and in turn, stability. It is important to do so to highlight areas for policy in crafting banking stability policies. This way, the trio of competition, regulation and stability could be better managed for optimal performance of banks in Zimbabwe.

CHAPTER 4

METHODS, PROCEDURES AND TECHNIQUES

4.1. Introduction

The objective of this chapter is to discuss the econometric models which were applied in this study. The models adopted will be discussed; variables and their proxies will be presented as well as estimation techniques and data sources.

4.2. Data types and sources

The data used in this study comprise a panel data set collected from the Reserve Bank of Zimbabwe Quarterly Bulletins and Bank supervision reports. We develop an analysis mainly based on annual data. Zimbabwean banks have been required to publish a year-to-date income statement and balance sheet at the end of each financial year. This provided extensive yearly financial statement data from 2011 to 2017 which is the duration of the study. We collected annual data on total assets, equity, net income, capital, non-performing loans, total loans, total deposits, interest income and total revenue of individual banks from their annual disclosure statements.

There are in total 18 banks that are included in the sample. Banks that operated throughout the whole period of the study were the ones included in the sample. The period chosen for consideration is 2011 to 2017. The number of observations is 126 (i.e., 18 banks x 7 years). We used data on Commercial banks, Building societies and a Savings bank.

4.3. Definition and Measurement of variables

In this section, we first describe the measurements of market concentration and bank competition and then we discuss the proxies of financial stability and regulation along with other bank-specific control variables. In the next section, section 4.4., a brief description of the Unit Root Test applied is laid out. Section 4.5. provides a brief explanation of the two estimation methods that we used in this study, which are Panel Vector Autoregressive (PVAR) and Generalized Least Squares (GLS) models.

4.3.1. Objective 1: Measurements of Market concentration and bank-level competition

The measurement of concentration in any industry has long been debated as there are

many different approaches to its measurement. A general agreement prevails about the elements that constitute concentration measures i.e., the fewer the banks in an industry, the more inequality in terms of distribution of bank sizes. Concentration ratios are important for their ability to capture the structural features of a market. Therefore, they are often used in structural models to explain competitive performance in the banking industry as a result of market structure. The Herfindahl-Hirschman Index (HHI) is the most used concentration index. For example, in the United States, it is used in banking in the enforcement process of antitrust laws (Sahile *et al*., 2015).

To measure the degree of concentration in the banking sector, this paper used the HHI with each bank's deposits used as an input in calculating market share. The HHI was used to account for the number of banks in a market, taking into account the relative size of all banks in a market. Leon (2015) defines the HHI as the sum of the squares of the bank sizes measured as market shares of loans, deposits or total assets. It is an index that accounts for the market share of all banks in the system and it stresses the importance of larger banks as it assigns a greater weight to the biggest banks (Beck *et al*., 2006). It ranges from 0 for a perfectly competitive market to 10000 for a monopoly (Sahile *et al*., 2015).

It was calculated by squaring the market shares of all 18 banks in the sample and summing them up to account for concentration. The formula is given below:

$$HHI = \sum_{i=1}^{n} (MS_i)^2$$

Bank competition at an individual bank level was measured from two sides: the deposit market and the loan market. The competitiveness of each bank from the loan side was calculated as a ratio of its loans over the total loans of all banks. Similarly, bank competition of an individual bank as measured in terms of deposits was calculated as its deposits over total deposits. The increase in loans in Zimbabwe also came with an increase in non-performing loans (NPLs) and the collapse of several banking institutions (Abel and Le Roux, 2016). Some banks may appear to be performing better when competitiveness is looked at from the loan market, but such banks might be flourishing at the cost of increasing NPLs. Hence this study used both loans and deposits to measure bank competition. The expectation is a positive relationship between competition and stability.

4.3.2. Objective 2: Financial stability measurement

During the financial crisis in 2007-2008, the failure of individual banks mainly the large banks further distressed the whole banking system. This is because banks are closely interdependent and are affected by spillover of financial distress, especially in times of financial crises. In the post-crisis period, proper measurement of systemic risk has been the focus. Different methods of measuring systemic risks have been proposed. The most prominent two methods used are those that depend on data collected from the share market of bank's shares and those that rely on regulatory data such as accounting data. The latter is relatively easy to use as data is more accessible, the former requires the bank to be listed to access the data.

In this study, the Zscore was used as a measure of stability as proposed by Boyd and Graham (1986) in their pioneering study of using the Zscore as a risk indicator in banking and financial stability. It is an accounting-based calculation which shows the distance to default. It is a widely used measure of stability mostly because, in its calculation, it combines profits and capital which are bank buffers with the risk faced by banks. Zscore is computed as a ratio with the numerator as a sum of equity-asset ratio (E/A)) and the return on assets (ROA) divided by the standard deviation of the ROA.

$$\boldsymbol{Z}_{i,t} = \frac{(ROA_{i,t} + E/A_{i,t})}{\alpha ROA_{i,t}}$$

As proposed by Leaven and Lewis (2009); Lepetit and Strobel (2015), this study used log-transformations of the Zscore (which is normally distributed) because of its high skewness. The Zscore is the number of standard deviations by which a bank's returns must fall before it goes insolvent. The basic principle is how a bank's equity level relates to variability in returns. Favourability is a higher Zscore figure as this implies a lower probability of returns falling below the mean to an extent of wiping out all equity held by the bank. A lower Zscore implies a higher probability of insolvency (Schaeck and Cihak, 2014). In the calculation, the risk is represented by the standard deviation of returns and variability in return is absorbed by equity therefore a high equity base is necessary to absorb shocks on returns without the bank becoming insolvent. Based on the above, the general assumption is that a bank is declared insolvent once its equity level reaches zero. Realistically, this assumption does not hold as a bank needs a certain positive minimum level of equity capital to operate and this is enforced by regulatory laws of financial stability, for example, Basel Accord.

The consequence is that a high-risk bank will have a lower Zscore, and the counterpart is

that a higher Z-score indicates a lower risk of the bank, indicating that standard deviations of a bank's assets have to drop with a larger number to reach insolvency.

4.3.3. Objective 3: Measurement of regulation

Regulation is measured by the capital adequacy ratio (CAD) which we calculated by dividing total deposits by total assets. It is an indicator which compares the owned capital to the assets of the bank. In addition to the minimum capital requirement that banks are mandated to hold, some banks may maintain a certain level of paid-up capital based on each bank's level of risk (Ashraf *et al*., 2016). Therefore, in the model, we investigated the association between changes in bank capital and risk-taking. If the idea that less capitalised banks have higher risk-taking behaviour holds, we expect the results to show a positive relationship between regulation and bank stability.

4.3.4. Objective 4: Estimation of Control variables

In examining the interaction of bank regulation, competition and stability, the study opts to control for bank-level control variables. Such internal features that drive bank performance include i) credit risk ii) management efficiency iii) liquidity management iv) bank size and v) profitability. Some ratios from the financial statements can specifically act as proxies for the above bank-specific variables (Magweva and Marime, 2016).

i) Credit risk (NPL)

Non-performing loan ratio (NPL) was used as a proxy for credit risk. Credit risk simply refers to the potential that a bank borrower will fail to meet obligations as agreed. We calculated it as a ratio of non-performing loans to total loans. The interpretation is that a higher NPL ratio suggests that the bank's probability of insolvency has increased. When loan default increases in the banking sector, the stability of banks is threatened. A negative sign is expected between CR and stability.

ii) Management efficiency

Management efficiency was proxied by the ratio of a bank's salary and wages to total assets. Managers in banks are expected to enhance stability in banking by following prudential procedures and practices that promote efficiency. Efficiency is derived when they cut costs in operations, make the most of the resources they have and properly screen and monitor borrowers. Management efficiency is expected to have a positive effect on stability.

iii) Liquidity

Liquidity management was calculated by the ratio of a bank's total loans to total assets. The loans to assets ratio measure the total loans outstanding as a percentage of total assets. The higher the ratio the more liquidity risk and it indicates a bank is loaned up therefore its liquidity is low. A negative relationship with stability is expected.

iv) Return on Assets (ROA)

ROA is an indicator of how profitable a company is relative to its total assets. ROA was calculated using an accounting formula as net income divided by the total assets of the bank. It is expected to have a positive relationship with stability.

v) Bank size (LTA)

This study used total assets as a proxy for bank size. Specifically, a logarithm of the total assets was used to reduce the magnitude of the figures whilst maintaining the properties of the variable. Bigger banks are expected to attract a large pool of deposits and hence a favourable loan rate to investors. Therefore, big banks may take advantage of economies of scale resulting in stability. On the other hand, bank size implies control of the market in the deposit and loan markets. Oligopolistic competition may hinder stability as a result of the inefficiency of big banks as they consider themselves "too-big-to-fail". The study has a neutral expectation of the sign.

4.4. Unit root test

It is more common in statistical regression analysis to avoid working with non-stationary data to avoid spurious regression. Most financial time series exhibit trending behaviour or non-stationarity in the mean. If the variables in the regression model are not stationary, then it can be proved that the standard assumptions for asymptotic analysis will not be valid, hence, the study cannot validly undertake hypothesis tests about the regression parameters. The study used the Levin-Lin-Chu unit root test to check whether variables in the regression equation are stationary or not. The basic equation is stated as:

$$\Delta y_{it} = \emptyset y_{i,t-1} + z'_{it}\Upsilon_i + \sum_{j=1}^{p} \theta_{ij}\Delta y_{i,t-j} + u_{it}$$

The null and alternative hypotheses are stated for each variable in the regression equation as below:

H0: panels contain unit roots

H1: panels are stationary

4.5. Estimation methods

Objective 5: Testing the relationship among Competition, Regulation and Stability.

While there have been significant studies on the relationship between bank competitiveness and bank stability, the further expected or unexpected relationship among regulation, stability and competition has received little attention. We use two different methodologies to investigate the relationship among competition, stability and regulation. These are Panel Vector Autoregressive (PVAR) and Feasible Generalized Least Squares (FGLS) models. In the following sections, we briefly discuss these models.

4.5.1. PVAR

The dynamic relationship among bank competition, bank stability and regulation will be examined through Panel Vector Autoregressive Granger causality (PVAR) to test the direction of Granger causality amongst the key variables. Many studies have employed PVAR estimation techniques to analyse variables in banking particularly (Saeed and Izzeldin, 2014; Louhichi and Boujelbene, 2016). PVAR model is the best suiting for this study due to the complexity of the relationship among the variables; the PVAR allows the relationship among the three variables to be endogenous and thus does not require a specific a priori relationship among them. Additionally, the PVAR model accounts for the individual heterogeneity inherent in panel data, which we can remove by introducing a fixed-effects term in the regression. There would be a correlation between the fixed effects and the regressors because of the dependent variable lags which result in biased coefficients. To eliminate this problem, we use the Helmert procedure following Love and Zicchino (2006) which removes only the forward mean. This method allows us to use lagged regressors and estimate the equation by system GMM. The model takes the following form:

$$Stability_{i,t} = \alpha_i + \sum_{k=i} \beta_{ik} Stability_{i,t-k} + \sum_{k=i} \Upsilon_{ik} Competition_{i,t-k} + \sum_{k=i} \Theta_{ik} Regulation_{i,t-k} + \varepsilon_{i,t} \quad (4.1)$$

$$Competition_{i,t} = \alpha_i + \sum_{k=i} \delta_{ik} Competition_{i,t-k} + \sum_{k=i} \pi_{ik} Stability_{i,t-k} + \sum_{k=i} \rho_{ik} Regulation_{i,t-k} + \omega_{i,t} \quad (4.2)$$

$$Regulation_{i,t} = \alpha_i + \sum_{k=i} \varphi_{ik} Regulation_{i,t-k} + \sum_{k=i} \lambda_{ik} Stability_{i,t-k} + \sum_{k=i} \psi_{ik} Competition_{i,t-k} + \varepsilon_{i,t} \quad (4.3)$$

The variables in Equations 4.1 to 4.3: Regulation is proxied by capital adequacy (CAD), Competition is proxied by loan market share (lmarketshare) and deposit market share (dmarketshare), and Stability is proxied by the Zscore. These equations are repeated, replacing lmarketshare with dmarketshare to present an alternative model.

In Equations 4.1 to 4.3, all the variables must be stationary for each bank *i* at time *t*. In Equations 4.1 to 4.3, βik, γik, θik, δik, πik, ρik, φik, $\lambda ik$and ψik are parameters to be estimated. k is the number of lags. $\varepsilon i,t$, $\omega i,t$ and $\epsilon i,t$ are white noise error terms. αi are panel-specific fixed effects, which are eliminated in the estimation process through the Helmert transformation.

4.5.1.1. Test for over-identification and optimal lag length

We ran the models at various lag lengths and a test of over-identifying restrictions was considered in this paper. The Hansen J-test of over-identifying restrictions associated with Hansen (1982) was applied. It has a χ^2 null distribution asymptotically, with degrees of freedom equal to the number of over-identifying restrictions. The joint null hypothesis is that the over-identifying restrictions are valid instruments, i.e., uncorrelated with the error term and that the excluded instruments are correctly excluded from the estimated equation (Hansen, 1982). The models were run repeatedly at different lags and each was tested using the Hansen test. The results from these tests which will be discussed in detail in the next chapter proved the overall validity of the instruments. Next, we tested the stability of the PVAR for each of the various lag lengths.

4.5.1.2. Test for stability

The standard stability condition of the panel VAR coefficients is based on the modulus of each eigenvalue of the estimated model. According to Hamilton (1994) and Lutkepohl (2007), a VAR model is stable if all moduli of the companion matrix are strictly less than one. Stability implies that the panel VAR is invertible and has an infinite-order vector moving-average representation. The results obtained from testing the stability of the autoregressive process show that the PVAR does not satisfy stability conditions at all lags. Henceforth, we had to rely on another model and the FGLS model was the next best model.

4.5.2. FGLS

A second model of estimation adopted in the study is the Panel Multiple Regression Analysis based on the Feasible Generalized Least Squares (FGLS) model, following Gujarati

and Porter (2009). The fixed effects model was also applied. The advantage is that this model controls for the incidence of time-invariant omitted variables, which may be correlated with the other independent variables. GLS was preferred over Ordinary Least Squares (OLS) because GLS assigns equal weights to each independent variable from different sizes of banks (Sahile *et al*., 2015). Hence estimates produced by the GLS model are best, linear, unbiased and efficient (BLUE). In this context, the observations are combined time series data over many periods and cross-sectional data. Therefore, the general form of the panel regression model is as follows:

Model 1

$$ZSCORE_{it}=\beta 0+\beta 1LMARKETSHARE_{it}+\beta 2CAD2_{it}+\beta 3ROA3_{it}+\beta 4MGNTEFF4_{it}+\beta 5LIQDTY5_{it}+\beta 6BANKSIZE6_{it}+\beta 7DUMCOM7_{it}+\beta 8DUMSAV8_{it}+\beta 9NPLRATIO9_{it}+\varepsilon_{it} \quad \textbf{(4.4)}$$

Model 2

$$ZSCORE_{it}=\beta 0+\beta 1DMARKETSHARE_{it}+\beta 2CAD2_{it}+\beta 3ROA3_{it}+\beta 4MGNTEFF4_{it}+\beta 5LIQDTY5_{it}+\beta 6BANKSIZE6_{it}+\beta 7DUMCOM7_{it}+\beta 8DUMSAV8_{it}+\beta 9NPLRATIO9_{it}+\varepsilon_{it} \quad \textbf{(4.5)}$$

Where *ZSCORE* is bank stability, *LMARKETSHARE* and *DMARKETSHARE* are proxies for bank competition, *CAD* is the Capital Adequacy Ratio which proxies' regulation, *ROA* is bank profitability, *MGNTEFF* is management efficiency, *LIQDTY* is liquidity, *NPLRATIO* is Non-performing Loans Ratio and *BANKSIZE* is the banks' size, $\beta 0$ is the intercept, βi is the estimated coefficients, *e* is the error term, and *it,* is the Zimbabwean bank *i* at the year *t*. We used dummies for bank types (*DUMCOM* and *DUMSAV*), with Building Societies as the base group for comparison.

4.5.2.1. Heteroscedasticity and serial correlation

We suspected heteroscedasticity because banking sector data has a high chance of the residual changing from observation to observation. For example, even after accounting for bank size, we expect to observe greater variation in the profits of large banks than in those of small banks. Heteroscedasticity often arises in volatile, high-frequency time series data and cross-sectional data where the scale of the dependent variable and the explanatory power of the model tends to vary across observations. Hence the assumption guaranteeing unbiasedness of the model will be violated and inference may be misleading. In this paper, we assumed the specification test AR (1) of serial correlation with conditional heteroskedasticity as explained by Andrews and Guggenberger (2008). In contrast to an OLS estimator that minimizes the sum of squared deviations, a GLS estimator minimizes the sum of squared deviations multiplied by a weighting matrix to make the error variance constant (i.e., homoscedastic). The weighting

matrix thus accounts for the fact that the error variance matrix may display heteroskedasticity and/or serial correlation (i.e., that *ut* and *ut+1* are correlated for every *t*), despite there being no correlation between the constant and the error term (Gujarati, 2004). Hence, the GLS estimation method allows for the presence of AR (1) type of autocorrelation within panels and cross-sectional correlation, as well as, heteroscedasticity across panels. Durbin-Watson test was applied to detect the presence of serial correlation.

CHAPTER 5

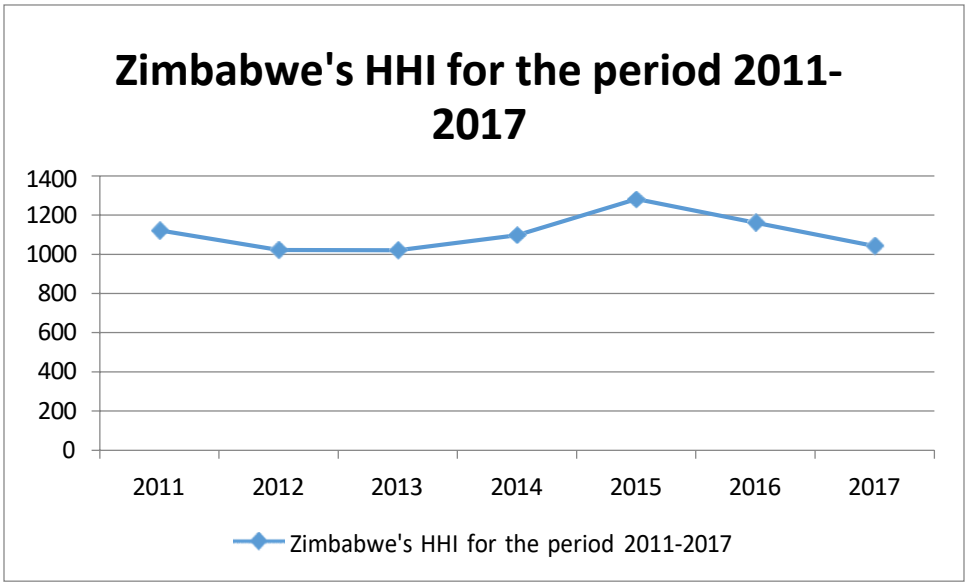
ESTIMATION AND INTERPRETATION OF RESULTS

5.1 Introduction

This chapter focuses on the estimation of the model to determine the coefficients, significance and reliability of the factors determining the stability of banks in Zimbabwe. The chapter presents summary statistics and interpretation of results.

5.2 Analysis of market concentration

Figure 8: **Concentration by time period**



Source: Author's calculations based on RBZ data.

Results of the calculation of concentration as measured by the HHI index are presented in Figure 8. The HHI averaged 1106.638 between 2011 and 2017. The HHI suggests that the Zimbabwean banking sector experienced reduced concentration and more competition as it gradually declined from 1121.899 in 2011 to 1022.248 in 2012 and 1020.887 in 2013, before rising again to 1097.592 in 2014. The highest HHI index was in 2015 when it was 1281.716. Leading to this period, there was a rapid and poorly-planned expansion of lending exposing banks to greater risk of loss. This positive trend in HHI reflects the flight to quality as depositors preferred to keep their money in larger banks due to high NPLs mostly in small banks, especially in 2014-2015. NPLs ratio rose from 9% in 2009 to 21% in 2014 (IMF, 2015). Between 2009 and 2014, about 53 % of total loans and advances were concentrated in five banks which are CBZ, CABS, Stanbic, Standard Chartered and BancABC (Tambo, 2017). This

analysis does not differ from Abel and Le Roux (2017) analysis who employed the Lerner Index to measure the degree of market power in the Zimbabwean banking sector from 2009-2014. Their results gave an average Lerner Index of 0.07, depicting that banks in Zimbabwe were operating in an environment with neither monopoly nor perfect competition. Hence this implies that the banking sector over the period was characterized by monopolistic competition. A downward trend in the HHI index between 2015 and 2017 is observed, indicating a decrease in concentration.

5.3 Summary statistics

The statistics for the competition measures, bank-specific variables, proxies for regulation and stability over the sample years are reported in Table 3. The common statistics are mean, median, maximum, minimum, standard deviation and number of observations.

Table 3: **Summary Statistics**

	zscore	**nplratio**	**lmarketshare**	**dmarketshare**	**cad**	**roa**	**Mgnteff**	**liqdty**	**Banksize(LTA)**
mean	5.235	13.566	5.556	5.556	54.841	2.820	3.565	48.238	19.424
P50	4.199	8.182	3.891	3.982	57.981	2.206	2.391	45.123	19.432
min	0.231	0.114	0.345	0.134	3.135	-3.445	0.097	1.726	17.305
max	15.948	88.249	35.226	25.952	100.397	36.018	30.917	474.655	23.719
sd	3.237	15.618	6.276	5.556	17.760	3.850	4.804	43.970	0.971
N	126	126	126	126	126	126	126	126	126

Source: Author's calculations based on RBZ data.

The proxy for stability, the zscore has an average of 5.235 for the period analysed, but the range goes up to a maximum value of 15.948. Capital Adequacy Ratio (CAD) has a mean of 54.841 and it ranges from 3.135 to 100.397. There is no significant difference in terms of competition between the two proxies which are lmarketshare and dmarketshare as they have the same average score of 5.556%. Lmarketshare score varies between 0.345% and 35.226% with a standard deviation of 6.276. Comparatively, dmarketshare score varies between 0.134% and 25.952% and has a standard deviation of 5.556.

Among the bank-specific control variables, credit risk proxy, the NPL ratio has an

average of 13.566% ranging from 0.114% to 88.249% with a standard deviation of 15.618. The logarithm of total assets (LTA) has an average score of 19.424 ranging from 17.305 to 23.719, with a standard deviation of 0.971. ROA's range is from -3.445 to 36.018 with a mean score of 2.820. The management efficiency score for the sample lies between 0.097% and 30.917%, with an average of 3.565% and a standard deviation of 4.804. The overall mean liquidity ratio is 48.238% and the minimum and maximum values are 1.726 and 474.655 respectively.

5.4 Multicollinearity test

Having analysed the summary statistics in the previous section, we provide a robust pairwise correlation analysis over the study period and the results are presented in Table 4. The relationship between explanatory variables is of importance in regression analysis. Explanatory variables that are strongly related cannot be included in the same regression equation. Most of the variables exhibit statistically significant correlations with strong associations. Using the rule of thumb for severe multicollinearity which is a zero-order correlation greater or equal to 0.8 (Cameron and Trivedi, 2005; Kennedy, 2008), the study has found no strong relationship between almost all the various pairs of explanatory variables. The highest correlation is between bank size and dmarketshare (competition) with a magnitude of 0.803. The rest of the figures fall well below 0.8 therefore the correlation matrix implies that there is no multicollinearity among the explanatory variables and hence the study results will be efficient. The study will proceed by running its regressions and assured of efficient, unbiased estimators.

Table 4: **Pairwise correlation results**

	zscore	nplratio	lmarkets hare	dmarket share	cad	roa	mgnteff	liqdty	banksize
zscore	1.000								
nplratio	-0.214 (0.016)	1.000							
lmarketshare	-0.258 (0.003)	-0.230 (0.010)	1.000						
dmarketshare	-0.491 (0.000)	-0.145 (0.106)	0.801 (0.000)	1.000					
cad	-0.242 (0.006)	-0.243 (0.006)	0.211 (0.018)	0.362 (0.000)	1.000				

roa	0.621 (0.000)	-0.277 (0.001)	-0.031 (0.726)	-0.127 (0.157)	0.205 (0.022)	1.000			
mgnteff	0.487 (0.000)	-0.197 (0.027)	-0.234 (0.008)	-0.302 (0.001)	-0.085 (0.347)	0.177 (0.048)	1.000		
liqdty	0.283 (0.001)	-0.206 (0.021)	0.295 (0.001)	-0.118 (0.187)	-0.025 (0.781)	0.175 (0.051)	-0.004 (0.964)	1.000	
banksize	-0.688 (0.000)	0.045 (0.619)	0.569 (0.000)	0.803 (0.000)	0.201 (0.024)	-0.272 (0.002)	-0.597 (0.000)	-0.188 (0.035)	1.000

Source: Author's calculations based on RBZ data.

The zscore has a negative significant correlation with all the variables except management efficiency, ROA and liquidity which have a positive and significant relationship with the zscore. These univariate correlations suggest that larger banks, banks with high credit risk, banks operating in a competitive banking sector and banks regulated stringently on bank capital have higher systemic risk. They also suggest that profitable banks, banks that are well managed and well-liquidated banks are more stable.

5.5 Unit root test

Table 5: **Levin-Lin-Chu unit root test**

Variable	**zscore**	**nplratio**	**lmarket-share**	**dmarket-share**	**cad**	**roa**	**mgnteff**	**banksize**	**liqdty**	***dliqdty (1ST Difference)**
Unadjusted t	-10.106	-38.498	-10.257	-12.404	-8.180	-8.466	-6.034	-5.496	5.963	-27.660
Adjusted t*	-4.579	-40.038	-9.086	-9.507	-3.949	-4.595	-2.029	-3.460	7.934	-26.050
p-value	0.000	0.000	0.000	0.000	0.000	0.000	0.021	0.0003	1.000	0.0000

Source: Author's calculations based on RBZ data.

Before establishing the PVAR model, it is necessary to judge whether each variable is stable, that is, whether the collected data has a unit root. To avoid working with non-stationary data, which yields spurious results, unit root tests using the Levin-Liu-Chu unit root test were undertaken. If the variables in the regression model are not stationary, then the standard assumptions for asymptotic analysis will not be valid. Table 5 above presents the results of the unit root test. All variables, except liquidity (liqdty) are stationary and integrated of order zero, I (0). Liqdty became stationary after being differenced once (*dliqdty). The variable is integrated of order one, I (1).

5.6 Determination of the Optimal Lag Order of the PVAR Model

After determining the stationarity of the model variables, the next important step in VAR estimation is to select the appropriate lag length. While selecting too long a lag length will result in a loss of degrees of freedom, selecting too short a lag length will fail to capture the model dynamics. To set the number of lags we employ Andrews and Lu (2001)'s procedure for GMM models based on Hansen (1982) *J* statistic of over-identifying restrictions. The lag period of the model is tested using Stata11.0, and its specific procedures and operating steps are borrowed from the Stata package of the PVAR model. As shown in Tables 6 and 7 below, we ran the models at various lags: at 1st lag, 2nd lag and 3rd lag for both model 1 and model 2. According to the tables, the tests suggest all lags are optimal. However, the estimation results of the Hansen's J statistic (J) are highest at 1st lag (35.284 and 43.845) in both model 1 and model 2. Hence the lag of the PVAR model suitable for both models is 1. The Hansen J-statistic also tests to check the instrument validity. As we can see, the p-values in the tests are greater than 0.1 meaning over-identifying restrictions are valid and the models have been correctly specified.

Table 6: **Hansen J test (Model 1)**

Lag	1st	2nd	3rd
Hansen J statistic (J) p-value	35.284 (0.169)	18.438 (0.564)	8.529 (0.573)

Source: Author's calculations based on RBZ data.

Table 7: **Hansen J test (Model 2)**

Lag	1st	2nd	3rd
Hansen J statistic (J) p-value	43.845 (0.125)	35.840 (0.692)	24.476 (0.496)

Source: Author's calculations based on RBZ data.

5.7 Estimation of the PVAR Model

In this section, we present the PVAR estimation results. To ensure the stability of the model and the accuracy of parameters, in this paper, the method of estimating the model is the generalized method of moments (GMM). The specific GMM estimation results of the PVAR model are shown in Tables 8 and 9. As the objective is to investigate the relationship among competition, regulation and stability, we mainly focus on the association among the Zscore, CAD and the two proxies of competition, the lmarketshare and dmarketshare. Once again, in line with the main objective, we discuss only the coefficients which are statistically significant

at the 1%, 5% or 10% level because there will be no reciprocal association if coefficients are insignificant.

The PVAR estimation technique provides some interesting results concerning the relationship among competition, stability and regulation. Table 8 shows that the estimated coefficient (0.486) of the lagged value of lmarketshare has a significant (at the 5% level) positive effect on the zscore. In the Granger causality framework, this means that lmarketshare does Granger-cause the z-score, and current period stability is affected by previous competition in the loan market. It suggests that if competition is well managed to cause efficiency, it may be beneficial to the system, as is argued in the competition-stability view. We observe that the lagged value of lmarketshare (1.375) has a strong positive impact on the lmarketshare and is significant at the 1% level. This means that current competition in the loan market is strongly determined by previous years' competition. Finally, we can see that competition influences regulation. The lagged value of the lmarketshare has a positive relationship with CAD (a coefficient of 2.045, significant at the 1% level). It gives an idea of how more competition will play a strong role in promoting capital adequacy. Banks tend to hold more capital when competition intensifies to shield against risk.

Table 8: **GMM estimation results of the PVAR model- Model 1**

	Coefficient	Std. Err	z	Pz	95% confidence interval	
zscore						
zscore L1.	0.284	1.657	0.21	0.744	-2.387	3.201
Imarketshare L1.	0.486	0.384	2.74	0.039**	0.034	0.909
cad L1.	0.345	0.475	0.68	0.338	-0.384	0.790
Imarketshare						
zscore L1.	-0.364	0.294	-0.86	0.323	-0.432	0.384
lmarketshare L1.	1.375	0.243	8.37	0.000***	1.843	3.223
cad L1.	0.201	0.047	1.95	0.132	-0.107	0.346
cad						
zscore L1.	-1.834	2.435	-0.89	0.386	-6.273	2.843
lmarketshare L1.	2.045	0.345	4.48	0.000***	1.845	3.054
cad L1.	0.395	0.685	0.86	0.574	-0.943	1.043

Source: Author's calculations based on RBZ data.
Notes: ***, **, * denote statistical significance levels of 1%, 5% and 10%. The Stata command *pvar*, with one lag, was used.

From Table 9, the alternative measure of bank competition, lagged dmarketshare has a positive and statistically significant relationship with CAD. It has a coefficient of 8.496 which is significant at the 1% level. In comparison to the effect of competition in the loan market on regulation, competition through the deposits market has a greater impact on regulation (CAD) as the former's coefficient is smaller than the latter's coefficient by 6.451. The relationship between lagged dmarketshare and zscore is negative and still highly significant (-11.045 and significant at the 1% level). Based on the analysis of this part, we can know that the detriment in stability is largely due to competition in the deposit market. It suggests an inverse relationship between competition and stability, hence model 2 gives evidence of the competition-fragility view. A negative and significant at the 10% level relationship between lagged value of CAD and dmarketshare (-0.049) exists. This means a small causal relationship "lagged CAD does granger- cause dmaketshare" exist. We, therefore, infer that as **Bank A** decrease its capital reserves, it will appear riskier to depositors compared to those banks holding more capital, which would intensify the competition for deposits faced by **Bank A**.

Table 9: **GMM estimation results of the PVAR model- Model 2**

	Coef.	Std. err	z	Pz	95% Conf. Interval	
zscore						
zscore L1.	-0.402	0.945	-0.93	0.823	-1.623	0.734
dmarketshare L1.	-11.045	1.549	-10.55	0.004***	-12.932	-11.345
cad L1.	0.118	0.543	0.67	0.732	-0.583	0.693
dmarketshare						
zscore L1.	-0.0034	0.056	-0.01	0.834	-0.273	0.324
dmarketshare L1.	-0.190	0.473	-0.83	0.483	-0.322	0.384
cad L1.	-0.049	0.074	-1.93	0.059*	-0.324	0.194
cad						
zscore L1.	-0.485	2.024	-0.95	0.284	-4.762	1.832
dmarketshare L1.	8.496	1.391	3.57	0.003***	4.950	15.456
cad L1.	0.295	0.402	0.22	0.923	-0.943	0.473

Source: Author's calculations based on RBZ data.

Notes: ***, **, * denote statistical significance levels of 1%, 5% and 10%. The Stata command *pvar*, with one lag, was used.

5.8 Stability test results

Then, to test the stability condition of PVAR model, the Eigenvalue Stability Condition

was applied. It is a post-estimation command which checks the stability condition of panel VAR estimates by calculating the modulus of each eigenvalue of the fitted model. According to Hamilton (1994), a VAR model is stable if all moduli of the companion matrix are strictly less than one. Tables 10 and 11 display the results of the Eigenvalue Stability Condition. We conclude that the models are unstable because not all the moduli are smaller than one.

Table 10: **Stability test for Model 1**

	Eigenvalue		
Lag length	Real	Imaginary	Modulus
1	1.852 0.283 0.283	0 -0.534 0.534	1.852 0.604 0.604
2	1.717 0.158 0.158	0 -0.601 0.601	1.717 0.621 0.621
3	1.941 0.536 0.536	0 -0.718 0.718	1.941 0.895 0.895

Source: Author's calculations based on RBZ data.

Notes: Not ALL the eigenvalues lie inside the unit circle.
pVAR doesn't satisfy stability condition.

Table 11: **Stability test for Model 2**

	Eigenvalue		
Lag length	Real	Imaginary	Modulus
1	0.144 0.144 -0.908	1.012 -1.012 0	1.022 1.022 0.908
2	0.234 0.234 -0.954	1.109 -1.109 0	1.153 1.153 0.954
3	0.432 0.432 -0.961	1.214 -1.214 0	1.412 1.412 0.961

Source: Author's calculations based on RBZ data.

Notes: Not ALL the eigenvalues lie inside the unit circle.
pVAR doesn't satisfy stability condition.

Now that we have established that the panel VAR model is unstable, unfortunately, it is difficult to overly generalise the results based on the PVAR model. Additionally, the different

proxies for competition (lmarketshare and dmarketshare) provide mixed results. To understand further the relationship among competition, regulation and stability, we directed attention to the Feasible Generalised Least Squares (FGLS) model.

5.9. FGLS estimation

Serial correlation/autocorrelation is often found in time series data when the error in one period is correlated with the errors in other periods. So, the Durbin-Watson test is performed to detect AR (1) serial correlation. If the AR (1) serial correlation is found to be present, the Feasible Generalized Least Squares (FGLS) approach will go ahead and be used as it corrects the autocorrelation. Simply put, FGLS is a remedial methodology. The values of the Durbin-Watson statistic are 1.845 and 1.923 in model 1 and model 2 respectively which shows positive autocorrelation.

Table 12: **Durbin-Watson test results**

	Model 1	**Model 2**
Durbin-Watson stat	1.845	1.923

Source: Author's calculations based on RBZ data.

Since the Durbin-Watson test detected AR (1) serial correlation, we ran the regression with Feasible Generalised List Squares (FGLS). The results are presented in Tables 13 and 14 for model 1 and model 2 respectively. The results do not significantly change when we use dmarketshare (instead of lmarketshare) in the proxy for bank competition, meaning that the results are robust.

Table 13: **FGLS model 1**

zscore	**Coefficient**	**Std. Err.**	**z**	**Pz**	**95% Conf. interval**	
nplratio	-0.005	0.008	-0.63	0.526	-0.021	0.011
lmarketshare	0.035	0.020	1.76	0.078	-0.004	0.073
cad	-0.013	0.006	-2.32	0.020	-0.024	-0.002
roa	0.324	0.018	17.84	0.000	0.2889	0.360
mgnteff	0.089	0.027	3.30	0.001	0.036	0.143
liqdty	0.005	0.003	1.65	0.099	-0.001	0.012
banksize	-1.825	0.212	-8.59	0.000	-2.241	-1.409
year	0.260	0.045	5.75	0.000	0.171	0.349

dumcom	-1.428	0.386	-3.70	0.000	-2.185	-0.671
dumsav	-2.455	0.457	-5.38	0.000	-3.349	-1.559
_cons	-483.228	89.423	-5.40	0.000	-658.493	-307.962

Source: Author's calculations based on RBZ data.

Table 14: **FGLS model 2**

zscore	**Coefficient**	**Std. Err.**	**z**	**Pz**	**95% Conf. interval**	
nplratio	-0.008	0.007	-1.13	0.258	-0.021	0.006
lmarketshare	0.118	0.037	3.22	0.001	0.046	0.189
cad	-0.023	0.007	-3.22	0.001	-0.036	-0.009
roa	-0.330	0.018	18.40	0.000	0.295	0.367
mgnteff	0.085	0.031	2.77	0.006	0.025	0.145
liqdty	0.006	0.003	2.14	0.032	0.001	0.012
banksize	-2.237	0.253	-8.84	0.000	-2.732	-1.740
year	0.327	0.047	6.99	0.000	0.235	0.419
dumcom	-1.173	0.371	-3.16	0.002	-1.899	-0.446
dumsav	-2.245	0.479	-4.69	0.000	-3.184	-1.307
_cons	-610.067	91.393	-6.68	0.000	-789.193	-430.940

Source: Author's calculations based on RBZ data.

5.9.1. Competition (lmarketshare and dmarketshare)

The results suggest a positive relationship between competition and stability. In both models, lmarketshare and dmarketshare which are proxies of the competition show a significant and positive effect on stability. Specifically, competition has reported positive coefficients (0.035 and 0.118) for model 1 and model 2, respectively that are both significant at the 1% level. This result is consistent with the hypothesis that competition is significantly associated with bank stability-promoting behaviour in the Zimbabwean economy. The results are similar to Makena (2021) study results which posited a positive relationship between competition and stability in the Zimbabwean banking sector. Similarly, Mlambo and Ncube (2011) in their study of South Africa found a significant positive impact of competition on stability, citing the effect of more efficient banks as the banking sector becomes more competitive. The results are consistent with more studies which determined a positive relationship between competition and stability (Akande and Kwenda, 2017; Zhao and Murinde, 2011; Nabieu, 2013 and Schaeck *et*

al., 2009).

5.9.2. Profitability (ROA)

In model 1 and model 2 the responses of stability to profitability are both statistically significant at the 1% level, positively for the former (0.324) and negatively for the latter model (- 0.330). Return on Assets (ROA) measures a bank's profitability by revealing how much profit a bank generates with the money invested in assets. As stated above, ROA has a statistically significant and positive (as expected) impact on stability, but not across all models. Under model 2 where dmarketshare is a proxy for competition, ROA has a negative and significant impact on stability. High profits can be good for banks as most profitable banks are more creditworthy hence, they get more customers. On the other hand, ROA and stability have a negative relationship as indicated by Srairi (2013) who found a negative relationship between ROA and bank stability. As a bank earns profits, it may mount up to monopoly profits which may result in larger (monopolistic) banks which are inefficient and complacent.

5.9.3. Credit risk (NPLratio)

We noted that NPLratio has a negative effect on stability although it is not significant. NPLratio coefficients have negative values (-0.005 and -0.008) in model 1 and model 2 respectively and they are insignificant at the 10% level. NPLs represent one major area of banks' credit risk (CR) exposure as it increases the chances of bankruptcy. Certainly, a higher amount of CR is related to a high probability of bankruptcy and the possibility of collapse. Hence credit risk as measured by the NPLratio was expected to be negatively related to the stability proxy. The results are similar to those of Akande *et al*. (2018) where a negative impact was obtained, the manifestation of risk, especially through losses in risk-taking behaviour in loan portfolios, is the major cause of fragility in SSA region countries.

5.9.4. Management efficiency (mgnteff)

Management efficiency positively affects bank stability, signifying good management practices are necessary for achieving better stability in the banking system. In model 1 and model 2, the coefficients reported positive values of 0.089 and 0.085 respectively, and they are both significant at the 1% level. Akande and Kwenda (2017) found similar results in SSA countries, a more competitive sector forces banks to adopt efficient practices which would enhance stability. Furthermore, the finding of this study is in line with Zhao and Murinde (2011) study of banking reforms that occurred in Nigeria during 1993-2008. The Nigerian

banking sector became more competitive as a result of the reforms and their findings indicate that bank productive efficiency was enhanced as banks behaved prudentially and adopted good management practices in light of a more competitive environment.

5.9.5. Liquidity (liqdty)

The effect of liquidity on stability is positive and significant (0.005 and 0.006) in both models 1 and 2 at the 10% and 5% levels respectively. This indicates that banks with adequate liquidity are more stable. A strong liquidity position makes it possible for banks to be better prepared for problems caused by unexpected withdrawals of funds. The recent financial crisis of 2008-2009 is also known as liquidity crisis as banks had insufficient liquid assets which led to panics and bank runs. According to Imbierowicz and Rauch (2014), most bank failures during the recent financial crisis of 2008-2009 were partly caused by the occurrence of liquidity problems. The results confirm the findings of Ghenimi, Chaibi and Omri (2017) which show a positive relationship between liquidity ratio and stability. Liquid assets enable banks to overcome any unexpected money withdrawals which may affect the stability of the sector if a bank has insufficient liquid assets which can be turned into cash immediately at a low cost.

5.9.6. Size (banksize)

Concerning size and stability, coefficients of bank size in both models presented in Tables 13 and 14 are negative and statistically significant. A per cent increase in bank size signals 1.8255 and 2.236 decreases in stability in model 1 and model 2 respectively. Hence as bank size increases so do its credit and other associated risks (Akande *et al*., 2018). The negative impact of bank size on stability can be attributed to larger banks possibly not so fast in making arrangements that increase stability (better loan diversification, loan write-offs and restructures of loan agreements) owing to the “too-big-to-fail” hypothesis. This is in contrast to Molyneux and Thornton (1992); Goddard *et al*. (2004) studies who find that bank size is positively related to bank profitability hence, bank stability. According to these studies, big banks can leverage economies of scale and benefit from increasing their market share, therefore, yielding greater profits. The results give support to the opposing view, large banks tend to hold less capital than small banks and have less stable funding compared to smaller banks. This suggests that larger banks have a distinct, possibly unstable business model (Laeven *et al*., 2014).

5.9.7. Bank type dummies (dumcom and dumsav)

Bank type has been found to significantly determine bank stability. Coefficients of type dummy variables (dumcom and dumsav) have reported negative signs (-1.428 and -2.245) in model 1 and (-1.173 and -2.245) in model 2, they are all significant at the 1% level. The negative signs imply that both commercial banks and savings bank are less stable compared to building societies (the base category) in both model 1 and model 2. Coupling these empirical findings with the context of banks in Zimbabwe should lead us to believe that banks supported by an explicit or implicit state guarantee an increase in their risk-taking (Merton, 1977). POSB is a state-owned bank and the government tends to protect it. The results are in line with Srairi (2013) view that government-owned banks have greater risk i.e., credit risk. Commercial banks in Zimbabwe are sometimes protected by the government for example the post-independence Zimbabwe government did not interfere significantly with the privileges of commercial banks for fear of outflows of capital (Harvey, 2002). Commercial banks will enjoy the widest scope of permissible activities and engage in a full range of banking services. This will initiate the moral hazard problem of too-big-to-fail as suggested by Berger and De Young (1997) which weakens the stability of the commercial banks.

5.9.8. Capital Adequacy (CAD)

The capital adequacy variable (CAD) has a negative and statistically significant effect on bank stability. CAD coefficients are -0.013 in model 1 and -0.023 in model 2 and they are statistically significant at the 5% level and at the 1% level respectively. The intuition that well-capitalised banks can easily meet the Basel Accord's regulatory capital standards and the excess capital is used as loans hence improvements in stability as argued by Berger (1995) is not supported by the results. This finding is in opposition to those of Dermirguc *et al*. (1999) and Kosmidou *et al*. (2005) indicating banks with high capital levels face higher costs in losses of going bankrupt which discourages reckless, high-risk lending practices that adversely affect stability. What we draw from this is that banks in Zimbabwe do not cope well with stringent capital requirements, especially since there is a recorded history of struggles to meet regulatory capital requirements (Nyoka, 2015 and Mhindirira, 2016).

CHAPTER 6

CONCLUSION

6.1. Discussion

The study set out to test the possibility of Granger causality among regulation, competition and stability and to analyse the effects of regulation and competition on stability. We investigated the interconnection among bank competition, regulation and stability in the Zimbabwean banking system. Furthermore; regulation, competition and other bank-specific variables were analysed for their effects on bank stability. Balanced panel data from 2011 to 2017 of eighteen banks were analysed using the Panel Vector Autoregressive (PVAR) and the Feasible Generalized Least Squares (FGLS) methods. The main results of the study findings from secondary data analysis are presented as follows.

The PVAR estimation method proved to be unstable hence the FGLS estimation method results are the main focus. The FGLS estimation method established a negative relationship between regulation and stability and a positive relationship between stability and competition. Among the other variables, stability has a positive relationship with liquidity and management efficiency in both models. Bank size and Credit risk (NPLratio) have a negative relationship with stability in both models. Profitability (ROA) has inconclusive results since it has both a negative sign and a positive sign in model 2 and model 1, respectively. The analysis also compares the stability of commercial banks and a savings bank, (POSB), against Building Societies (BS). The results indicate that commercial banks and POSB are less stable.

The study found support for the competition-stability view. The competition-stability/fragility nexus is one of the widely debated hypotheses in the banking literature. One strand of view argues that an increase in competition lowers the charter value of banks and induces excessive risk lending practices by banks causing instability. The other view argues that the lack of competition breeds large banks with a “too-large-to-fail” mentality which often results in inefficiency and may make the sector more fragile. Hence, an appropriate level of competition is necessary to yield stability. We find our results consistent with the competition-stability view with the notion that an increase in competition enhances bank stability in Zimbabwe and may contribute to the overall finding that greater competition improves bank stability.

Next, the impact of the bank regulatory variable on bank stability is considered and it is

deduced that capital requirements appear to be an unsuccessful regulatory tool in increasing bank stability. The finding is inconsistent with the theoretical literature that underlines that higher capital requirements place banks' equity at risk and reduce incentives for risk-taking and diminish the moral hazard problem (Furlong and Keeley, 1989; Keeley, 1990; Keeley and Furlong, 1990). Most banks experience the problem of the inability to raise the required minimum capital levels. Though the Monetary regulator is putting in measures to stabilise the banking sector, Mbizi (2012) study observed that the central bank is doing nothing to align its set capital levels to the risk profiles of each bank.

The study found that although competition and regulation affect overall bank performances, other bank-specific factors such as Bank size (banksize) and non-performing loans ratio (nplratio) affect stability adversely. Management efficiency (mgnteff) and liquidity (liqdty) contribute positively toward a bank's stability. The results are consistent with theory which suggests that banks are stable when they operate in an environment with good managerial practices, fewer NPLs, moderate concentration and good liquidity (Berger and DeYoung, 1997; Stulz, 2015; Mlambo and Ncube, 2011; Imbierowicz and Rauch, 2014; Ghenimi *et al*., 2017). Return on Assets (ROA) has a negative and positive relationship with stability in model 1 and model 2, respectively. In the same vein, despite the importance of capital reforms, these individual bank factors need to be taken into account and properly dealt with for capital reform success. For example, the challenge of high levels of NPLs in the Zimbabwean banking sector needs to be addressed as the study proved a negative relationship between NPLs and stability.

Overall, the findings emphasize the importance of a competitive environment for bank stability. The HHI index results of an average of 1106.638 over the study period indicate monopolistic competition. The results point out that competition is beneficial in banking, and stringent regulatory measures may exacerbate fragility in the sector. For a comprehensive investigation of the influence of regulation on bank stability, the level of competition in the market needs to be considered. More accurate inferences about the net impact of regulation on bank stability are achieved by considering the relationship between regulation policies and competition. Since competition positively impacts stability, the regulatory policies must encourage new entrance/or support the survival of existing banks to increase/maintain competition in the sector. This infers that favourable capital requirements must be in place. For example, stricter capital requirements have negatively impacted the survival of existing banks in Zimbabwe due to their inability to meet the capital adequacy ratio (Nyoka, 2015). Regulators

may be able to improve bank stability by softening some regulations on capital requirements. Strict minimum capital requirements are found to decrease bank stability in Zimbabwe, and any increase in these requirements has to be considered cautiously.

Overall, the results lend support to the view that fostering the appropriate regulatory framework is very important for ensuring stability. This regulatory framework includes the design of entry and exit policies, good prudential regulation and safety net policies. The Basel II Accord reinforces raising the minimum capital requirement based on the fact that entry barriers and activity restrictions are associated with greater stability. However, the results prove the opposite of this, the negative relationship between stability and regulation emphasises how the effectiveness of some of the Basel Accord policies aimed at increasing stability is reduced in economies such as the Zimbabwean economy with less competitive banking environments and good prudential regulation. To improve banking sector stability, it is recommended that monetary authorities should base the regulatory capital on the proportion of risky assets in the bank's balance sheet. The incentive framework needs to strike a balance between curbing excesses while avoiding making markets less contestable. This is achieved by designing policies according to an individual country's unique economic state and challenges.

6.2. Policy implications, Limitations of the study and Recommendations

This paper has important policy implications. The research findings suggest that competition is associated with greater stability. Hence, we do not observe a trade-off between systemic stability and competition; this emphasizes the importance of maintaining a competitive environment in the Zimbabwean banking sector. Furthermore, the results also stress the importance of the regulatory framework. Promoting entry of new banks (by lowering the minimum capital requirement) will increase contestability and reduce systemic fragility.

The study investigated the relationship among bank competition, regulation and stability in the Zimbabwean banking sector and does not attempt to reach conclusions on the impact on banking systems around the world. Henceforth, the outcome of this research cannot be applied everywhere in the world as it is an analysis done for a specific country, which in this case is Zimbabwe, with its banking system and economic environment that differs from other countries.

We recommend a further study be done to investigate the impact of non-capital requirements on the banking system in Zimbabwe. Increasing regulatory capital requirements

for banks may not ensure the viability of the banking sector. Generally, it is agreed that regulatory capital is an important variable in terms of policy and what remains is for monetary authorities to decide how best to utilise this variable to improve stability. Hence policy should focus on other non-capital regulatory requirements as complementary to capital regulations in efforts to improve bank stability.

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