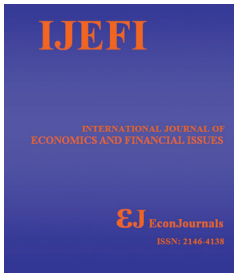

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Competition and Bank Stability

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ABSTRACT

The study investigates the effect of competition on bank stability in the Zimbabwean banking sector. After encountering episodes of bank failures, which altered the competitive landscape and episodes of high non-performing loans which contributed to banking sector insolvency and bank failure motivated the study. The study uses a two - step method to establish whether the Zimbabwean banking systems adheres to competition stability or competition fragility hypothesis. In the first step the study estimates the measures of financial sector competition and stability. In the second step, the study applies the generalised method of moments dynamic panel data to test the "competition-stability" and "competition-fragility" hypothesis respectively. The results show that the banking sector supports the competition fragility hypothesis which means that an increase competition in the banking sector leads to banking fragility. Bank ownership has no influence on the stability of the banks. The study recommends that the central bank should closely monitor banks to ensure adherence to international best practice in credit management and moderate pro-competitive policies.

Keywords: Competition, Stability, Fragility, Non-performing Loans, Lerner Index, Generalised Method of Moments
JEL Classifications: G01, G21, G33

1. INTRODUCTION

The role of competition in the banking sector has been extensively studied (Claessens, 2009; Antwi & Antwi 2013; Yildirim & Philippatos 2007; Berger & Hannan 1989; Pagano 1993; Guzman 2000). The studies revealed that competition enables efficient resources allocation to productive use, brings balanced development in a country, enhances product innovation, enhance prospects of economic growth, improves efficient production of financial services and reduces credit risk (Caminal and Carmen, 2002). Competition is not supposed be a sudden process given that it can potentially cause bank insolvency (Bikker & Bos 2005).

One of the controversial aspects in literature pertains to the role of competition in influencing bank stability (Schaeck et al., 2006; Jiménez et al., 2007; Berger et al., 2009). Studies (Staikouras and Wood, 2000; Koskela & Stenbecka 2000; Schaeck et al., 2006; Berger et al., 2009) support bank competition and argue that it leads to financial sector stability. Studies (Matutes and Vives 2000, Jiménez et al., 2007 and Fungacova and Weill, 2009) argue that excessive competition leads to financial sector fragility. The 2008/9 global financial crisis is a good example which is perceived to have resulted from intense competition as a result of excessive financial innovations coupled with inadequate regulations (Ganić, 2012).

The Zimbabwean banking sector has experienced significant changes during the period 2009 to 2017. This period coincided with economic stability and growth after a decade of economic decline. During the period, the sector experienced growth in deposits, loans, capitalisation, and assets, signalling a stable and growing sector. The market share of the top four banks declined significantly during the period, reversing the flight to quality challenge which characterised the period before 2009. During the period 2009-2017, there were nine bank failures which were recorded. This was compounded by the growth in non-performing loans (NPLs) which increased to 20.1% in September 2014. There has also been a number of government interventions in the sector to contain the situation, including setting of lending interest rates by the central bank. The decline in the number of banks gave an impression of declining competition among players as the few remaining players would have larger market shares. This was uncharacteristic of a stable economic environment whereas competition in the financial sector was expected to bring depth and stability to the sector. The

growth in NPLs subsequent to bank failures further signalled that competition remained intense, suggesting that the signs of fragility. The mix of signals of stability and fragility necessitates an investigation into the relationship between competition and the stability of the banking sector.

Banks were also experienced to increased competition from non-bank financial institutions and mobile money during the same period. Despite banks proactively responding to competition by adopting new methods of containing costs, deepening customer relationships, and repricing their products, there remains concerns on the implication of competition on the stability of the banking system. Given these developments the study seeks to investigate how competition affects financial sector stability. Specifically, the objective of the study is to empirically examine whether competition promotes stability or fragility in the Zimbabwean banking system. The study therefore contributes to the debate on the role of competition on bank stability.

The rest of the study is organised as follows; section 2 discusses the stylised facts about the Zimbabwean banking sector followed by a review of theoretical and empirical literature in section 3. The study methodology is discussed in section 4 while section 5 presents and discusses the study results. Section 6 concludes the study and proffers study recommendations.

2. STYLISED FACTS ABOUT ZIMBABWEAN BANKING SECTOR

After a decade of economic repression, the banking sector in Zimbabwe was liberalised in 1991. Financial sector liberalisation entailed deregulating the sector. This involved the removal of price controls, entry barriers and the issuance of licences to new banks. Financial sector liberalisation was meant to promote the efficiency of the financial sector and promote economic growth (Harvey, 1995). The liberalisation of the banking system was undertaken at the realisation that excessive regulations and controls were inhibiting competition. Financial liberalisation reduced bank efficiency leading to financial fragility (Kanyenze et al., 2011). The liberalisation of the financial sector was also meant to do away with the oligopolistic market structure that characterised the banking system. The banking system had become a cartel, which limited the scope for competition in the market as banks colluded in the pricing of banking products hence inhibiting competition and banking system efficiency (Mabika 2001).

With the opening up of the banking system, there was a proliferation of new indigenous banks. The entrance of these new locally owned banks halted the dominance of the foreign owned banks which had characterised the banking system. The first indigenous bank under the liberalised environment was licenced in 1997. Subsequently, the number of banking institutions increased more than threefold. The total number of banks increased from ten before liberalisation to thirty banks at the end of 1999. The architecture of the banking sector was composed of commercial banks, merchant banks, finance houses, discount houses and building societies (Kanyenze et al., 2011).

The economic situation deteriorated between 1998 and 2008 in what is now termed the lost decade. This was evidenced by a cumulative decline in gross domestic product (GDP) of 40%, inflation rising to officially reach 231 million percent by July 2008, government defaulting on its international debt and falling into arrears and the international community withdrawing balance of payment support (Government of Zimbabwe, 2009). The situation was summarised in the government short term economic recovery programmes (STEP) economic policy document, "At the epicentre of the economic crisis, have been unprecedented levels of hyper-inflation, sustained period of negative GDP growth rates, massive devaluation of the currency, low productive capacity, loss of jobs, food shortages, poverty, massive de-industrialisation and general despondency."(Government of Zimbabwe, 2009).

The effects of macro-economic instability during the crisis period permeated the banking sector and the underlying weaknesses in the financial sector were exposed. The major highlight of the banking sector developments was the collapse of 13 banks between 2003 and 2008. The collapse was a result of insolvency and unsound administrative and accounting practices; imprudent, unauthorised non-performing insider loans; departure from core business to unauthorised business; imprudent risk management practices; poor corporate governance arrangement; externalisation of foreign currency and malpractices among others (Reserve Bank of Zimbabwe, 2009). The collapse of financial institutions reduced competition and innovation in the banking system. Financial deepening was stunted as the banking public started to shun banks due to increased uncertainty. Banking system instability led to shunning of the banks by the banking public who then resorted to keeping their money outside the banking system (Kanyenze et al. 2011).

In an effort to restore macroeconomic and financial sector stability and enhance growth, the government dollarised the economy in 2009. This was meant to instil optimal stability after a decade of monetary and financial disorder and the measure managed to arrest the debilitating hyperinflation and economic decline.

The introduction of dollarisation led to a sharp decline in inflation. The economy moved from a hyperinflationary environment to stable economy. During the period, the economy experienced 27 consecutive months of negative inflation between November 2014 and January 2017 (ZimStats 2015) as shown in Figure 1.

Dollarisation also forced the government to exercise macro-economic discipline which improved the credibility of policies. The government adopted fiscal restraint through the use of cash budgeting. During the period 2009-2012, the government managed to maintain a balanced budget. The adoption of dollarisation also led to the incapacitation of the central government ability to generate seigniorage, revenue that the government obtains from issuing domestic money. Government was forced to look for alternative sources of revenue and reduce government expenditures.

The number of operating banking institutions declined from 28 in December 2008 to 21 by July 2016 (Table 1). The decline in the number of banks was a result of the collapse of some banks and the

consolidations and mergers that took place in an effort to meet the stringent regulatory capital requirements since most banks had to start the recapitalisation process upon dollarisation. During the period only one bank came on stream, the National Building Society. The failure of the banks was mostly due to poor corporate governance, insolvency and imprudent lending activities (RBZ 2014).

NPLs increased from 1.8% in February 2009 to 20.1% in September 2014 (Reserve Bank of Zimbabwe 2015) as shown in Figure 2. The growth in NPLs limited the capacity of banks to expand financial intermediation. High and rising levels of NPLs exerted strong pressure on bank balance sheets, with adverse effect on banks' lending operations hence limiting the capacity of banks to expand financial intermediation. The increasing amount of the NPLs led to disintermediation in the economy with banks cutting down on lending and requesting borrowers to pledge collateral even for small loans. NPLs affected bank performance, reducing the profitability of the sector through increased provisioning.

Table 1: Number of operating banks

Type of Institution	December 2008	July 2012	July 2014	July 2016
Commercial banks	15	18	15	14
merchant banks	6	2	1	1
Discount houses	3	0	0	0
Finance houses	0	0	0	0
Savings bank (POSB)	1	1	1	1
Building societies	4	4	3	4
Total	28	25	20	20

Source: Reserve Bank of Zimbabwe (2009, 2012, 2014, 2016)

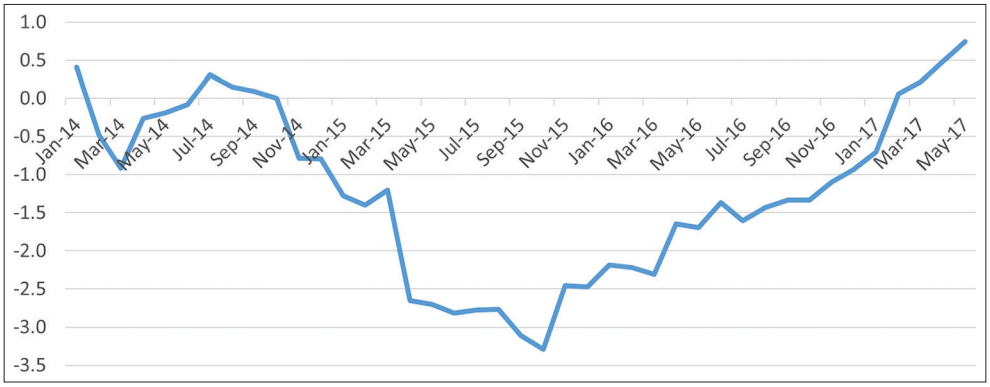
The surge in NPLs was attributed to the high cost of borrowing, weak credit risk management, absence of robust credit reference systems, insider loans, over indebtedness and inappropriate loan structuring (RBZ, 2013). The NPLs resulted in the collapse of some of the banking institutions.

The discussion above shows that the banking system in Zimbabwe experienced banking failures starting after the country adopted financial liberalisation. The bank failures characterised the banking sector in both periods of economic stability and economic instability. Bank failures have been a phenomena of the banking sector in Zimbabwe since the sector was opened up to new entrants. The study therefore seeks to determine whether competition led to bank stability or fragility.

3. LITERATURE REVIEW

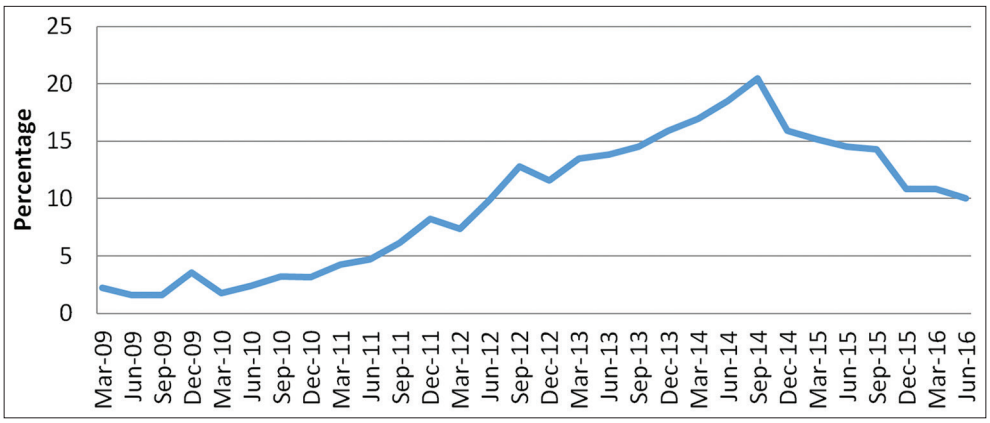
There are a number of studies that have investigated the effect of bank competition on banking stability (Staikouras & Wood, 2000; Beck et al., 2006; Boyd et al., 2006; Schaeck et al., 2006; Jimenez et al. 2008; Berger et al., 2009). Broadly, the literature can be distinguished into the competition stability hypothesis and

Figure 1: Inflation development



Source: ZimStats (2015)

Figure 2: Non-performing loans



Source: Reserve Bank of Zimbabwe (2015)

competition fragility hypothesis. Some of the findings from these studies are discussed in this section. These have been divided into theoretical and empirical literature review.

3.1. Theoretical Literature Review

The competition-stability hypothesis posits that banking system competition leads to financial stability (Boyd & De Nicoló 2005). A banking system that is not competitive leads to higher interest rates which can incentivise borrowers to engage in higher risk investments. The high interest rates increase the chances of default by borrowers leading to an increase in NPLs, which can translate to banking fragility. Therefore more competitive banking systems are considered to be more stable. Boyd & De Nicoló 2005 also refers to this as the risk-shifting hypothesis. In an effort to avoid failures, banks in concentrated systems are supported through subsidies to prevent them from failing. Such policies lead to banking system instability as banks increase their risk taking.

The competition-fragility hypothesis claims that competition forces banks to take excessive risks which leads to instability. The competition-fragility hypothesis suggests that an increase in competition leads to financial sector instability. Beck (2008) named this competition-fragility hypothesis, the 'Charter Value' hypothesis. Beck (2008) argued that because of the pressure on profits, the banking sector players have greater incentive to take excessive risks if they are operating in a more competitive environment, which causes financial sector fragility. The relationship between banks and borrowers gives banks limited informational rents, which curtails the banks incentive to screen borrowers. Carletti (2005) argued that under the competition fragility hypothesis, the chances of bank runs are increased as a result of higher deposit rates and reduced margins, which worsen the problem of excessive risk taking. Competition increases with liberalisation, which increases entry into the banking sector, leading to financial fragility.

Vives (2010) identified two channels through which competition may lead to financial fragility. The first one is that competition worsens the coordination problems of depositors and investors, which leads to bank runs or bank panics that may be of a systematic nature. In this channel, financial fragility can arise outside competition, but pressure arising from competition can exacerbate the coordination problem of depositors and investors leading to potential instability and the probability of a crisis. The second channel is through increasing the incentive to take the risk, hence increasing the probabilities of failure (Vives, 2010). Financial fragility can be a result of a contagion effect where a small shock affects a single bank initially and then spreads to other banks before affecting the whole system (Allen & Gale, 2000; 2004). Beck (2008) argued that larger banks with diversified portfolios are a source of fragility since the diversified portfolio could lead to concentration in the banking sector.

3.2. Empirical Literature Review

Keeley (1990) investigated the relationship between competition and financial stability in the US banking system. The study found that those banks holding less market power had a lower risk of default which provided empirical evidence of competition fragility in the US banking system. In another US study, Demsetz et al. (1973) studied the implication of franchise value on risk-taking behavior for the period 1986-1994. The study found that there was a negative relationship between risk and the franchise value hence supporting the competition fragility hypothesis.

Staikouras and Wood (2000) study the Spanish and Greek banking system. The study investigates the structure and sources of profitability for the two banking systems for the 1980's and 1990's. The study revealed that banks in Spain were more profitable compared to their counterparts in Greece. The results revealed support for the competition stability hypothesis. Matutes and Vives (2000) reviewed the impact of deposit competition on the conduct of banks. The study concluded that higher deposit rates were generated by uninsured markets under perfect competition, supporting the competition fragility hypothesis. Koskela & Stenbecka (2000) found that an increase in competition leads to a decline in lending rates which increases investments. The results also showed that the competition-fragility hypothesis was neither supported nor accepted. Schaeck et al. (2006) investigated the competition stability hypothesis using the Panzar and Rosse H-Statistic and the average proportion of the total assets held by three largest banks in the banking system of 38 countries. The study employed logit and duration analyses to undertake the investigation. The study provided evidence of competition stability hypothesis. Jiménez et al. (2007) investigated the competitiveness of the Spanish banking system and found that greater banking competition generated increased NPLs. The results meant risk behaviour was brought about by competition supporting the competition-fragility hypothesis.

Berger et al. (2009) found that the risk exposure of banks was driven by higher market power. The greater market power increased loan portfolio risks, which supports the competition-stability theory. Berger et al. (2009) also tests the competition stability hypothesis using competition measures of Lerner and HHI and risk measures of NPLs and Z-index. The sample size was 8,235 banks drawn from 23 developed countries. The results were not consistent depending on the techniques that were employed for empirical estimation. Fungacova and Weill (2009) investigated the relationship between competition and financial sector stability of the Russian banks for the period 2001-2007. The study approximated competition using the Lerner Index and applied the panel logit analysis to determine the effect of competition on bank collapses. The study found that the banking system was following the competition fragility hypothesis.

Liu et al. (2012) studied the degree of competition in European countries during the period 2000-2008. The study investigated the existence of the competition-stability relationship. The study established a non-linear relationship between competition and stability. A negative relationship was established between competition and net interest margin (a proxy for profit), implying that an increase in banking competition decreased the net interest margins and increased bank stability. This supported the competition stability hypothesis. Hakam et al. (2013) studied the determinants of competition in Morocco. Competition and concentration were positively correlated while

profitability and economic growth were negatively correlated. This showed that sustained economic growth enabled banks to maintain a competitive edge through retaining their share of the markets and sustaining high levels of concentration. The positive relationship between competition and the interbank interest rate meant that monetary policy positively impacted the level of competition.

The literature review has shown that there is generally no consensus on whether competition in the banking system leads to stability or fragility. The empirical results have been mixed and have mostly relied on different techniques that have been employed by the different authors and the jurisdiction where the study was undertaken. This becomes the entry point of the current study as it seeks to contribute to the literature.

4. STUDY METHODOLOGY

The study uses a two - step method to establish whether the Zimbabwean banking systems adheres to competition stability or competition fragility hypothesis. In the first step the study estimates the measures of financial sector competition and stability. In the second step, the study applies the Generalised Method of Moments (GMM) dynamic panel data to test the "competition-stability" and "competition-fragility" hypothesis respectively.

4.1. Estimating Competition

There are three main approaches to empirical measurement of competition in the banking sector. These are the structural, new structural and new empirical industrial organisation methods (Claessens, 2009; Leon, 2014). The structural approach to measuring competition is premised on indicators such as the concentration ratio measured by the market share of top banks in the system or the Herfindahl-Hirschman Index (HHI). The approaches assume that a concentrated banking system reduces competition leading to an increase in profitability. These concentration measures mirror the effects of the number of players and the size distribution of firms in the industry to reflect the nature of competition. The structural approach then infers the nature of competition from the relatively straightforward numerical indicators (Leon, 2014). Literature concentrates on three widely-used measures of concentration namely the number of firms, the concentration ratios and the HHI. The main advantage of the structural approaches is low data requirement. The weaknesses of the structural methods included the lack of strong theoretical underpinning; uncertainty on the linkage between structure and conduct; undefined direction of causality and difficulty ascertaining implication of different levels of concentration (Ergungor 2004). The concentration measures are associated with empirical implementation and challenges of failing to properly define the market. It fails to define the physical market and the product market (Shaffer 2004).

The new structural measures rely on regulatory indicators to measure the degree of contestability. The method is based on regulatory requirements such as entrance requirements, the existence of barriers to entry into the banking system by the local banks or foreign banks, and other types of restrictions (Leon, 2014). The theory of contestability argues that firms are able to behave competitively in the absence of barriers to entry while financial regulations act as an obstacle to the free entry and exit into the banking system (Leon, 2014). The contestability theory takes into account changes over time in financial instruments and innovations given that these can alter the competition environment. There has been an expansion in the competition determinants with the inclusion of regulatory and institutional variables.

The new empirical industrial organisation (NEIO) derives conclusions about competitive pressure from directly observing the conduct of the firms in the market (Leon, 2014). These methods use formal competition measures that proxy the reaction of output to input prices. The NEIO methods have been developed to circumvent the weaknesses of the structural approaches. The weakness of the structural approaches lies in their assumption of one way causality from market structure to performance. These methods fail to account for the conduct of the banks in the market and the impact of performance on market structure. The NEIO infer firms' conduct directly from its structure. The approaches use optimisation models from which are derived indicators of competition. These methods include the Lerner index, the Panzar and Rosse test H-statistic, the conjectural variation parameters and the Boone indicator. The current study adopts the new empirical industrial organisation (NEIO) method of Lerner Index to establish the market structure and competition levels in the banking system.

4.1.1. Lerner index

The Lerner Index is a relative mark-up of price over marginal cost (Lerner, 1934) and measures the bank's exercise of market power (Simpasa, 2013). Coccorese (2009) notes that the Lerner index is a true reflection of the banks' degree of market power which allows the behavioural departure from monopoly and perfect competition. The market power of a firm can be identified by the difference between the price and marginal cost. There should be no difference in price and marginal cost under perfect competition while any difference shows that the market is less competitive (Simpasa, 2013). A bigger difference between the price and marginal cost shows that there is greater monopoly power.

The Lerner Index is bank-specific and changes over time making comparisons of market power among banks over the study period possible. The model further allows market power to be measured separately for the different banking markets (e.g. commercial banks, building societies, foreign banks, domestic banks, etc.) and is thus of relevance for this study. Another strength of the model is that it can disentangle various market structures. The Lerner Index, unlike the Panzar-Rosse model of measuring competition, is not dependent on the equilibrium in the banking sector.

The cost function is derived from the works of Pruteanu-Podpiera Weill and Shobert (2008) and is specified below.

$$\ln\left[\frac{TC_{it}}{w_{3it}}\right]=\alpha_0+\alpha_1 \ln Y_{it}+\frac{1}{2}\alpha_2\left(\ln Y_{it}\right)^2 +\pm_3 \ln\left(\frac{w_{1it}}{w_3 it}\right)+\alpha_4 \ln\left(\frac{w_{2it}}{w_{3it}}\right)+\alpha_5 \ln\left(\frac{w_{1it}}{w_{3it}}\right) \ln\left(\frac{w_{2it}}{w_{3it}}\right)+\frac{1}{2}\alpha_6\left[\ln\left(\frac{w_{1it}}{w_{3it}}\right)\right]^2+\frac{1}{2}\alpha_7 \left[\ln\left(\frac{w_2 it}{w_{3it}}\right)\right]^2+\alpha_8 \ln Y_{it} \ln\left(\frac{w_{1it}}{w_{3it}}\right) +\alpha_9 \ln Y_{it} \ln\left(\frac{w_{2it}}{w_{3it}}\right)+\varepsilon_{it} \quad (1)$$

The model assumes the cost function has one output, loans and three input prices (w_1 = Price of labour, w_2 = price of physical capital, w_3 = price of borrowed funds). The cost function (TC) takes the form of a translog cost function. The assumption of linear homogeneity in input prices is imposed by normalising total costs and input prices by one input price.

The estimated coefficients of the cost function (1) are then used in the calculation of the marginal cost in equation (2). The marginal cost is equal to the product of the derivative of the logarithm of total cost to output and total cost over output.

$$MC_{it}=\frac{TC_{it}}{Y_{it}}\left[\alpha_1+\alpha_2 \ln Y_{it}+\alpha_8 \ln\left(\frac{w_{1it}}{w_{3it}}\right)+\alpha_9 \ln\left(\frac{w_{2it}}{w_{3it}}\right)\right] \quad (2)$$

Bank level marginal cost (mc_{it}) and corresponding output price, measured as total income divided by total bank assets (P_{it}) are in turn used to calculate the bank specific time varying lerner index.

$$Lerner_{it}=\frac{\left[P_{it}-MC_{it}\right]}{P_{it}} \quad (3)$$

The Lerner Index ranges between 0 and 1. Higher values imply greater market power. In a perfectly competitive industry the price is equal to marginal cost giving a Lerner Index value of zero, indicating that firms have no market power. A bigger difference between price and marginal cost shows that there is greater monopoly power. The Lerner Index can be negative since banks may choose as a consequence of predatory conduct or because of external factors, such as an economic crisis, to allow prices to go below the marginal cost leading to negative mark-ups (Coccorese 2014). Given that the index is calculated from observed and calculated information, the Lerner Index can also be negative (Coccorese 2014). Simpasa (2013) claimed that the negative Lerner Index could be evidence of superior competition.

4.2. Financial Stability

Financial stability or fragility of Zimbabwean banks will be considered in terms of banks risk taking dimensions and will be measured using the non-performing loan ratio (NPLs) and Z-score.

The ratio of NPLs to total gross loans is often used as a proxy for asset quality and is intended to identify problems with asset quality in the loan portfolio hence a sign of fragility in the banking system. It is calculated by using the value of NPLs as the numerator and the total value of the loan portfolio (including NPLs, and before the deduction of specific loan loss provisions) as the denominator.

The Z-index potentially measures the accounting distance to default for a given institution (Amidu and Wolfe, 2013). The authors further note that the Z-score initially measures the probability of a bank becoming insolvent when the value of assets falls below the value of the debt.

The Z–index is computed as:

$$Z_{it}=\frac{\left[ROA_{it}+EA_{it}\right]}{\delta ROA_{it}} \quad (4)$$

Where EA is the equity to assets ratio and σ (ROA) is the standard deviation of the return on assets. The Z-index goes up as profitability and capitalization increase, and decreases as the variability of earnings increases. Thus, there is a trade-off between Z-index and a bank's probability of failure (Berger et al, 2009). The higher the value of the Z-score, the lower the probability of insolvency.

4.3. Empirical Model for Estimating Competition Stability or Fragility

The empirical models used to evaluate competition stability/ fragility are given in equation 5 and 6.

$$\ln Z_{it}=\alpha_{it}+\gamma Z_{it-1}+\beta_1 lerner_{it}+\beta_2 lerner_{it}^2+\beta_3 \ln assets_{it}+\beta_4 loata_{it}+\beta_5 Foreign_{it}+\varepsilon_{it} \quad (5)$$

Where ln Z is the natural logarithm of Z-index, Lerner is the Lerner Index of competition, lnassets is the natural logarithms of total assets, loata is the measure of natural logarithm of total loans over total assets and foreign is a dummy variable capturing foreign ownership.

$$\ln NPL_{it}=\alpha_{it}+\gamma NPL_{it-1}+\beta_1 lerner_{it}+\beta_2 lerner_{it}^2+\beta_3 \ln assets_{it}+\beta_4 loata_{it}+\beta_5 Foreign_{it}+\varepsilon_{it} \quad (6)$$

Where NPL is the measure of NPLs in terms of total loans and other variables remain as defined above.

The two models above will be estimated using the GMM so as to address the potential problem of endogeneity with regards to loan risks, capitalisation level and overall bank risks.

4.4. Data

The data is drawn from the income statements of banks. The banking sector in Zimbabwe is composed of twenty financial institutions (14 commercial banks, 4 building societies, a merchant bank and a savings bank). The sample size of the study is eleven commercial banks chosen on the basis of completeness of data for the study period (2010-2016) using bi annual data.

5. PRESENTATION AND INTERPRETATION OF RESULTS

Table 2 shows the descriptive statistics of the estimated Lerner Index and the Z-score. The average score of the Lerner Index is 0.076 meaning that the average banks mark-up above marginal cost was 7.6 % (Table 2). Given the low levels of the Lerner index, it means that the banking sector was operating under monopolistic competition. There was significant competition among banks signified by the minimum value of the index which was negative during the period. This is also confirmed by the median value of 0.17 showing that score of the majority of the banks. Coccorese (2014) argue that a negative Lerner Index is usually a consequence of predatory conduct or because of external factors, such as an economic crisis which forces prices to be less than the marginal cost. The negative Lerner index is also explained by the intense competition experienced in the industry (Simpasa, 2013).

Table 2 shows that the average Z-score is 0.78. There was wider dispersion between the maximum and minimum z-score values reflected by the standard deviation of 1.16 showing some levels of instability.

The results for the estimation of the competition stability are presented in Table 3. The results show that there is a positive relationship between the Lerner Index and the Z-score. This means that market power positively influences banking sector stability. An increase in the market power of banks leads to an increase in the stability of the banking sector. Given the inverse relationship between market power and competition, the results mean that an increase in competition leads to a decline in the banking stability. This then supports the competition fragility hypothesis. This implies that an increase in competition leads to the fragility of the banking sector.

The results depict that an increase in competition leads to an increase in NPLs. This means that as competition increases, credit risk also increases leading to a surge in NPLs. This supports the competition fragility hypothesis. The result implies that as competition is intensified in the banking sector, banks relaxed their credit management mechanisms which led to the deterioration of the quality of the loan book hence leading to the fragility of the banking sector. Previous studies that found similar results supporting the competition fragility hypothesis include; Keeley (1990), Demsetz et al. (1973), Matutes and Vives (2000), Jiménez et al. (2007) and Fungacova and Weill (2009).

The findings that the banking experiences competition fragility hypothesis are supported by the developments that characterised the banking sector during the period starting 2009. During the period, there were nine bank failures. Among the major reasons of the failures was imprudent lending activities (RBZ 2014) which degenerated into NPLs. Banks witnessed a surge in NPLs which climaxed at 21 % in September 2014 which forced the central bank to intervene through a number of initiatives. Some of these initiatives included a directive to banks outlawing the issuance, renewal and rollover of insider loans (RBZ 2014), requirement for banks to provide adequately for the NPLs so as to reflect their true positions in terms of credit risk in their portfolio and improvement of risk management through stress testing (RBZ 2014). The Central bank also announced the setting up of a special purpose vehicle to purchase all secured NPLs from the banks (RBZ 2014). The initiative was meant to assist the banks in cleaning their balance sheets by buying all secured non-performing assets.

Table 2: Descriptive Statistics of the estimated Lerner Indices and Z-score

Statistic	Lerner Index	Z-score
Mean	0.07592	0.7875
Median	0.16640	0.5994
Maximum	0.9505	18.1364
Minimum	−1.6506	0.0425
Standard deviation	0.3023	1.1609
Observations	154	154

Source: Own calculation

Table 3: Estimation results of competition stability/ fragility

Variable	LnZ	NPL
Constant	0.9950	−0.1129
	(0.0000)***	(0.1269)
Ln Z(-1)	0.6035	
	(0.0000)***	
NPL(-1)		0.8593
		(0.0000)***
Learner	0.1330	−0.0307
	(0.0007)***	(0.0740)*
Lerner –squared	−0.0530	−0.0038
	(0.003)***	(0.8476)
LnAssets	−0.0592	0.0061
	(0.0000)***	(0.1213)
Loata	0.0512	0.0295
	(0.0848)*	(0.0416)**
Foreign	0.0221	−0.0119
	(0.1882)	(0.0977)*
Diagnostics		
Durbin Watson	1.809	1.572
J-B	9.68E-21	1.48E-19
Observations	252	252

Source: Own calculation

The results further show that bank size as measured by level of assets has a negative relationship with stability and a positive relationship with NPLs. The results means that an increase in bank size leads to a decline in the stability of the banking sector. It is also shown that an increase in bank size is associated with an increase in the amount of NPLs. This can be attributable to diseconomies of scale which arises as the bank size increases leading to the difficulty in monitoring the loans. It can be deduced from these results that the source of instability in the banking sector is through increasing size of banking institutions which lead to higher NPLs. This is in support of the banking fragility hypothesis. This result support Beck (2008) who argue that larger banks with diversified portfolios are a source of fragility.

The results further depict that an increase in the proportion of loans over assets leads to an increase in the stability of the banking

sector. The results imply that an increase in the share of loans in the total asset portfolio of the bank leads to banking sector stability reflecting the fact that loans are an important determinants of the portfolio of the bank.

Bank ownership i.e. foreign owned or domestic owned have no effect on the stability of the banks. This means that whether a bank is domestically owned or foreign owned does not affect the stability of the banking sector. Bank ownership hence has a neutral effect on the stability of the banking sector. On the other hand foreign ownership of banks has a negative relationship with NPLs implying that foreign banks are associated with low levels of NPLs. Conversely, this means that domestic banks are associated with high levels of NPLs. The high NPLs among domestic banks are a result of poor credit management emanating from the need to grow assets by domestic banks. Foreign banks have low levels of NPLs because they have adopted the international best practice in credit management. Foreign banks are usually governed through a two pronged approach dictated at parent company level overseas as well as domestic regulations which makes them have water tight systems for vetting, issuing, monitoring and evaluating loan processes. This makes sure that their credit risk is very low compared to domestic banks.

6. CONCLUSIONS

The study evaluates the impact of competition on the banking sector. Specifically, the study evaluates whether competition promotes stability or fragility in the Zimbabwean banking system. Episodes of bank failures which altered the competitive landscape and episodes of high NPLs which contributed to banking sector insolvency and total collapse of about nine banks motivated an investigation of the impact of competition on stability. The results have shown that the banking sector supports the competition fragility hypothesis which means that an increase competition in the banking sector leads to banking fragility. Competition has been found to be the main cause of the deterioration in the assets of the banks. As competition increased banks increased their risk profile by failing to adhere to best practice of credit management worsening the fragility of the system.

The study also revealed that that an increase in bank size led to a decline in the stability of banks and increased NPLs. The size of the bank hence had a negative influence on the banking sector reflecting the effects of diseconomies of scale. Bank ownership i.e. foreign owned or domestic owned have no effect on the stability of the banks. On the other hand foreign ownership of banks have a negative relationship with NPLs implying that foreign banks are associated with low levels of NPLs while domestic banks have higher non-performing loan ratios.

Drawing from the results the study recommends that the central bank should moderate procompetitive policies to ensure that competition does not lead to fragility. This implies there should be close monitoring of the banking sector to ensure adherence to international best practice. Banks should also be encouraged to adhere to proper credit risk management mechanisms and the Basel requirements on credit. Banks should also adopt and implement the requirements of various regulations instituted by the central bank.

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