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STABILITY AND PROFITABILITY OF COMMERCIAL BANKS IN TANZANIA

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ABSTRACT

The study examined the causality between bank profitability and stability of commercial banks (CBs) in Tanzania using panel data covering 10 years (2006-15). Bank profitability was measured using Return on Assets (ROA) and Return on Equity (ROE) while stability was measured using Z-score and the ratio of Non-performing loans to total loans (NPL/TL). The study included 22 banks and employed Granger Causality Test in Heterogeneous Panels as a method of analysis. The findings revealed that there is a positive bidirectional relationship between ROE and Z-score in large and small banks. This implies that banks in Tanzania should strive to increase both ROE and Z-score since they cause each other. The study also found that ROE does granger cause the ratio of NPL/TL in small and large banks while the ratio of NPL/TL was found to granger cause ROA and ROE in small banks. This might be implying that loans are almost the only source of income for small banks that is why NPL/TL do cause their profitability. Hence, the study recommends that, small banks should be keener on how to manage their loans and should expand their activities to earn more non-interest income which would ensure their stability even when their loan portfolios are not performing well. The findings concerning ROA and Z-score indicated that there is a bidirectional relationship between ROA and Z-score in small banks. These findings imply that the profitability and stability in small banks do cause each other. Thus, the study recommends that the management of small banks should aim to accomplish both simultaneously as they cause each other.

Keywords: *Bank Profitability, Bank Stability, commercial banks, Bank services, Tanzania*
Paper type*: Research paper*
Type of Review: *Peer Review*

1. INTRODUCTION

The primary responsibility of central banks worldwide has always been to maintain banks' stability [Bank of Tanzania (BoT), 2011]. Bank stability, which refers to the distance of an individual bank from insolvency gained more acclaim globally particularly after the Global Financial Crisis (GFC) of 2007-2009 (Morgan and Pontines, 2018; Mostak, 2016). After the GFC of 2007-2009, many central banks reviewed and strengthened their regulatory and supervisory regimes to reduce the probability of occurrence of future crises in their economies (Zheng *et al.*, 2017). Regulations that have been revised by central banks to improve bank stability in their economies include: capital adequacy, liquidity, and credit limit exposure (BoT and BoT, 2015; 2011).

While bank stability is the concern of central banks, bank profitability has for centuries continued to be central to the operation of banks as it ensures their survival (Tan and Anchor, 2016). Bank profitability which refers to economic outcomes and effectiveness is important to investors, shareholders and the management as it shows the management's ability in managing the bank's assets and shareholders' funds to earn income (Alharth, 2016). The question that is still debatable among banks' stakeholders is whether bank stability is also causing the bank profitability or whether bank profitability is also causing bank stability.

Scholars worldwide have laid down their negative and positive views on the influence of bank stability on bank profitability. The negative view argues that bank stability which is mostly achieved by imposing tighter capital requirements affects the banks' lending capacity which in turn reduces the bank profitability (Fraisse and Thesmar, 2015). Swamy (2018) argued that tighter capital requirements reduce the bank profitability as they cause banks to switch from loans which are higher risk-return locus to low-yielding securities which are lower risk-return locus. On the other hand, the positive view argues that tighter capital requirements reduce the willingness of shareholders to take excessive risks thus, are facing low bankruptcy risks (Swamy, 2018; Mehran and Thakor, 2011). Allen *et al*. (2011) noted that, as the bank faces low bankruptcy risks, debt holders demand low-interest rates, thus the bank become more profitable.

Empirical evidence from previous studies has also indicated that the debate on the influence of banks stability on profitability is still inconclusive. Employing regression analysis and measuring bank stability using capital ratios, Swamy (2018), Ozili (2018) and Zheng *et al.* (2017) found that bank stability was positively influencing bank profitability while Stovrag (2017) found that bank stability was negatively affecting bank profitability. Applying regression analysis and measuring bank stability using Z-score, Alharthi (2016), Mollah and Zaman (2015), Mamatzakis *et al*. (2015), Anginer *et al*. (2014), and Fu *et al*. (2014) found that bank stability was positively influencing bank profitability while Apergis (2014) found that bank stability was negatively influencing bank profitability. On the other hand, Tabak *et al*. (2015), Zhang *et al*. (2015) and Ghosh (2014) found no evidence whether bank profitability and stability were related in any way. In another studuy, Tan and Anchor (2016) employed the auto-regressive-distributed linear model to investigate the inter-relationships between the profitability and stability of 100 CBs in China for the period 2003-2013. The study found out that lower bank stability leads to higher profitability and higher profitability leads to higher instability.

Review of existing literature indicates that a few empirical studies have been carried out specifically to investigate the relationship between bank stability and profitability. Even those few existing studies, all except Tan and Anchor (2016) employed regression analysis as their model of analysis to investigate the relationship. This indicates a need to investigate the relationship between bank stability and profitability using another method of analysis to add more empirical knowledge to the existing one. Therefore, this study was carried out as an attempt to fill such a gap by employing Granger causality test in heterogeneous panels as the method of analysis. Specifically, this study aimed: -

(i) at showing show the trend concerning the profitability and stability of CBs in Tanzania, and
(ii) at analysing the causality between the stability and profitability of CBs in Tanzania.

The study used CBs in Tanzania as the units of analysis because BoT like any other central banks worldwide is continuing to put in place several regulations such as regulations for capital requirements, liquidity, credit limit exposure and statutory minimum reserve against deposit and borrowing with the aim of improving bank stability (BoT and BoT, 2015; 2011). Although BoT has been promoting a stable banking sector for decades, the relationship between the stability and profitability of CBs in Tanzania to the best of the researcher's knowledge has not been empirically investigated. Therefore, this study was undertaken to fill such a gap.

2. THEORETICAL REVIEW

This study is anchored on three theories known as resource based view (RBV) theory, competition fragility theory, and the uncertainty bearing theory of profit. These theories are herein discussed under item 2.1 to 2.3.

2.1 RBV theory

The RBV theory was proposed by Barney in 1991. This theory advocates that the performance of the firm is influenced by resources (both assets and skills or capabilities) it owns. Barney (1991) and other proponents of this

theory such as Teece *et al.* (1997), Peteraf (1993), and Mahoney (1995), argue that the existence of heterogeneous resources among firms is what causes heterogeneous performances among them. In summary, this theory asserts that the firms that own superior resources will have superior performances. The theory was used in the interpretation of descriptive statistics with regard to the profitability of large and small banks. Based on the view of this theory, large banks were expected to be more profitable than small banks because large banks are endowered with superior resources compared with small ones.

2.2 Competition fragility theory

Competition fragility theory was proposed by Keeley in 1990. This theory suggests that the banking sector which is dominated by few large banks is more likely to be unstable compared to the banking sector with many banks (Boyd and De Nicoló, 2006). It must be noted that when the banking sector is dominated by few banks, there is less competition among banks. Due to the absence of competition in the banking sector, the dominating large banks might be considered as too big to fail or too important to fail thus receive special attention from the government (Fiordelisi and Mare, 2014). Usually, when banks are considered as too big to fail, they take excessive risks believing that it is hard for the government to let them fail (Demirgüç-Kunt and Huizinga, 2013). This is because their failure might affect negatively the growth of the entire economy. The ultimate effect of large banks taking excessive risks with the notion of being too big to fail is more likely to cause bank instability (Anginer, *et al*., 2014).
According to International Monetary Fund (IMF) (2018), the Tanzanian banking sector is so crowded, concentrated, with a skewed distribution. IMF (2018) documented that the largest two banks and ten banks hold about 40% and 71% respectively of total bank assets, loans, and capital. According to the World Bank group (2017), the ten largest banks control about 80% of market share leaving about 20% market share to be shared among 48 small banks, with market shares below 1-2 percent each. This implies that there is less competition among banks since few banks dominate the sector. Thus, this theory was relevant in this paper as it was used to interpret whether large banks in Tanzania which are dominating the sector are taking excessive insolvency and credit risks as a result of the notion of being too big to fail.

2.3 The uncertainty bearing theory of profit

The uncertainty bearing theory of profit was developed by Knight in 1921. This theory asserts that profit is the reward of bearing non-insurable or uncertainties risk. The Knight's (1921) theory of profit was relevant in this paper as it was used to interpret findings with regard to the causality between bank profitability and stability. It must be noted that bank profitability was measured using two profitability ratios namely ROA and ROE while bank stability was measured using two ratios which are Z-score and the ratio of NPL/TL. Z-score and the ratio of NPL/TL were measuring the effect of insolvency and credit risks respectively. Based on Knight's (1921) theory, the bank with higher credit and insolvency risk was expected to be more profitable compared with the bank with lower credit and insolvency risk.

3. RESEARCH METHODOLOGY

3.1 Research design and target population

The study employed a longitudinal research design as the study used panel data covering ten years (2006-15). The target population of the study was 36 CBs operating in Tanzania as at December 2015. The year 2006 was used as a base year since in that year two important laws in the Tanzanian banking sector viz. Banking and Financial Institution Act (BFIA) and Bank of Tanzania Act (BoTA) were amended. The amendment of these Acts marked the new era for the Tanzanian banking sector.

3.2 Sampling procedures, sample size, data and sources of data

22 banks out of 36 banks were included in the study. The selection of only 22 banks was due to the method of analysis used which is Granger causality test in heterogeneous panels. This method of analysis requires panel data to be strongly balanced (Horváth *et al.,* 2012; Anderson *et al.,* 2014). That is, each bank which was included in the study was supposed to have 10 complete observations from 2006-15. The period of ten years is adequate enough for drawing a reliable conclusion as long as panel data and the method of analysis used are concerned (Horváth *et al.,* 2012; Tani and Joyeux. 2013). Panel data used in this study are banks specific extracted from the banks' audited financial statements sourced from BOT.

Further, to have detailed findings on the objectives of the study under scrutiny, banks were further categorized into two groups – large and small banks. The categorisation of these banks was as per IMF (2016). IMF (2016) categorized banks with assets above Tanzanian shillings (TZS) 711 259 million as large banks while banks with assets between TZS 75 591 and 711 259 million as medium banks. Lastly, banks with assets below TZS 75 591 million were categorized as small banks. As per IMF (2016), the category "small banks" was made by community banks which were not included in this study and only 2 CBs which had unbalanced panel thus were also not studied. Thus, banks which were included in this study fall into two categories – large and medium banks. For the sake of this study, the category medium banks were reclassified as small banks to have a meaningful categorisation. The category "large banks" was made up by 9 banks while "small banks" was made up by the rest 13 banks.

3.3 Operationalisation of variables

3.3.1 Bank stability

Z-score and the ratio of NPL/TL were used to measure bank stability. The study used both variables because each variable provides different information regarding to bank stability. Lepetit and Strobel (2016) noted that Z-score is the most common measure of bank stability because it is easily calculated and the data used in its calculation are publicly available. Z-score indicates the bank probability of default, that is, to fail to honour its obligation from creditors partially or in full (Lepetit and Strobel, 2016; Mare *et al.,* 2015). Simply put, Z-score measures the insolvency or bankruptcy risk of the bank. Nthambi (2015) and Mare *et al*. (2015) noted that Z-score indicates the number of the standard deviation by which returns have to diminish to deplete the equity of bank or banking system. The following is the formula used in the computation of Z-Score: -

$$\mathrm{Z-score} = \frac{(k+\mu)}{\sigma} \quad \text{(1)}$$

Where; k is equity capital and reserves as a percent of total assets, μ is average net income as a percent of total assets and σ is the standard deviation of return on assets.

The second measure of bank stability employed is the ratio of NPL/TL which was also used by several researchers such as Ouhibi *et al.* (2017), Klein (2013) and Li (2003) as a measure of bank stability. Mare *et al*. (2015) asserted that the ratio of NPL/TL indicates the quality of loans. Mataba (2016) argued that loans represent the largest portion of the total bank assets and earn more income to a bank than all other assets. Therefore, it is apparent that the ratio of NPL/TL reflects the health of the whole banking system (Mare *et al.,* 2015). Mare *et al.* (2015) explained that the ratio of NPL/TL is used as a measure of bank stability because the level of NPLs affects negatively the profitability, liquidity and capital adequacy ratios of the bank which can lead to bankruptcy risk or total closure.

3.3.2 Bank profitability

Two variables viz. ROA and ROE were employed as the measures of bank profitability. Both measures were used because each ratio captures and provides different information about the profitability of the bank. ROA is the most used measure of bank profitability in literature followed by ROE because both are relevant in measuring the profitability of the bank and are also easily calculated and interpreted (Alharth, 2016; Al-Matari *et al.,* 2014). Uremadu *et al.* (2017) asserted that ROA measures the ability of the bank's management to generate income by utilizing the bank's assets. Researchers such as Munyambonera (2012) and Alharth (2016) pointed out that the major limitation of ROA is of being distorted by bank's off-balance-sheet activities. The formula used to calculate ROA is:

$$ROA = \frac{Net\ profit\ after\ tax}{Total\ assets} \quad \text{(2)}$$

The second measure of bank profitability used which is ROE measures the ability of the bank's management to generate income in relation to shareholders investments (Nthambi, 2015). Unlike ROA, ROE is not distorted by off-balance-sheet activities but tends to disregard financial leverage (Alharth, 2016; Ommeren, 2011). Nthambi (2015) argued that this might cause banks that rely on debt financing to have a favourable ROE compared to those with high quality-oriented capital structure. The formula used to calculate ROE is:-

$$ROE = \frac{Net\ profit\ after\ tax}{Total\ Equity} \quad \text{(3)}$$

3.4 Model of analysis

The model of analysis employed to investigate the causality between bank stability and profitability is Granger causality test in heterogeneous panels developed by Dumitrescu and Hurlin (2012) as the extension of the work of

Granger (1969). Granger (1969) developed a statistical procedure called Granger causality test to test the causality between time series (Foresti, 2006). The logic behind Granger causality test assumes that the cause usually occurs before its effect (Rousseau and D'Onofrio, 2013 and Granger, 1969). Formally, X is a cause of Y if its past value can help to predict the future value of Y concerning a forecast, considering only past values of Y (Granger, 1969). Since Granger causality test was designed purposely to test the causality between time series; it was not useful to test the causality between panel sets (Dumitrescu and Hurlin, 2012). Due to this limitation, Dumitrescu and Hurlin (2012) developed a procedure of testing the causality between panel sets. Dumitrescu and Hurlins' (2012) test statistic is based on the individual Wald statistics of Granger non-causality averaged across the cross-section units. Furthermore, Dumitrescu and Hurlins' (2012) test provide reliable findings even when a very small sample is used (Lopez and Weber, 2017). The study employed Stata Version 15 as a tool of analysis and the user-written command known as "xtgcause" which was developed following procedures prescribed by Dumitrescu and Hurlin (2012) was employed.

3.5 Diagnostic test

The only assumption that needs to be met to use Granger causality test in heterogeneous panels is Stationarity (Lopez and Weber, 2017). Dumitrescu and Hurlin (2012) noted that the assumption of stationarity must be met so that the findings would be accurate and appropriate. The study applied the Levin-Lin-Chu unit-root test to test whether the panel data were stationary. According to Biorn (2017), Levin-Lin-Chu unit-root test is the best test statistics for stationarity when balanced panel data is concerned. The null hypothesis which guided this test was "panels contain unit roots" while the alternative hypothesis was "panels are stationary". Biorn (2017) noted that the null hypothesis is rejected when the P value ≤ 0.05. The findings with regards to Levin-Lin-Chu unit-root test are presented in Table 1. The findings indicate that the assumption of stationarity was not violated as the P values ≤0.05.

4. FINDINGS AND DISCUSSION

Findings presented in this section are presented as per objectives of the study. The first part (4.1) presents descriptive statistics which cover the first objectives that aimed to show trends with regard to the profitability and stability of CBs in Tanzania. The second part (4.2) addresses the second objective by investigating the causality between profitability and stability of CBs in Tanzania using the Granger causality in heterogeneous panels.

4.1 Trends with regards to profitability and stability of CBs in Tanzania

Trend analysis was used to present the descriptive statistics for variables measuring bank stability (NPL/TL and Z-score) and profitability (ROA and ROE). Trend analysis is among the strongest tool used to provide a detailed picture with respect to variables under scrutiny when a panel or time-series data are concerned (Musau, 2018). Trends were constructed using the annual mean values for the underlying variables under consideration and were plotted against time.

4.2 Profitability of CBs in Tanzania

The study findings on the profitability of CBs in Tanzania which were measured using ROA and ROE, indicate ROA and ROE for large banks were higher than small banks for the whole period under study (Figure 1 and 2 respectively). The findings indicate that ROA for large banks were higher than small banks for the whole period under study. The findings also indicate that the highest value of ROA recorded for large banks was 3.11% in 2007 while for small banks was 2.05% in the same year. The lowest value of ROA recorded for large banks was 1.55% in 2013 while for small banks was 0.22% in 2014. Furthermore, findings with regards to the entire baking sector indicate that ROA was positive for the whole period under study. The highest value recorded was 2.58% in 2007 while the lowest was 1.15% in 2014. The higher value of ROA in 2007 can be explained by the trading and fee income to total income which was higher in that period compared to subsequent periods (BoT, 2007). The gradual decline of ROA from 2008 to 2010 was due to the fall of interest income and non-interest income as a percentage of total income during that period (BoT, 2010). This fall is possibly the result of the global financial crisis which occurred between 2007 and 2009. Also, the period between 2008-2011 the shilling was weakening against USD while the inflation rate was high reaching the highest level of 19.8% in 2011 (BoT, 2011). Lastly, the reason which can explain the declining trend of ROA in smaller banks can be due to the decline of effective lending rate from

2012-2014 driven by large banks and the increase of effective interest rate paid on deposit from 2011-2014 (IMF, 2016). The decline of the effective lending rates and the increase of effective lending rates were possibly used by banks as one of the strategies to increase the business volumes by attracting more borrowers and savers. The changes in these rates might have been caused by the fall of interest rates on government bonds which are usually used as a benchmark for pricing most of bank products.

The findings about ROE indicate that ROE for larger banks were higher than those of small banks for the whole period under study. ROE for large banks was declining gradually from 29.44% in 2007 to 14.83% in 2010 before improving to 17.55% in 2011. ROE for small banks was declining gradually since 2006 to 2009 before improving in 2010. It then declined gradually from 10.95% in 2010 to 6.22% in 2012 before it improved a little bit to 6.53% in 2013. As for ROE of the entire sector, findings indicated that it was positive ranging between 23.83% and 9.30%. Findings indicate that there was a declining trend for almost all the period under study. The declining trend seen especially in small banks might be the indication that banks were increasing the level of their capital while the profit earned was not growing in that proportion. This also indicate that the change in the absolute minimum capital requirement announced in 2010 from TZS 5 billion to TZS 15 billion affected ROE of CBs in Tanzania. This implies that a large amount of funds is tied up in terms of capital balances instead of lending it out to earn profit. Furthermore, the declining trend can be explained also by the decrease of the effective lending rate from 2012-2014 driven by large banks and the increase of effective interest rate paid on deposit from 2011-2014 (IMF, 2016).

The conclusion that can be drawn from the findings with respect to profitability of CBs in Tanzania when both ROA and ROE are considered is that large banks were outperforming small banks for the whole period under study. This implies that large banks are enjoying economies of scale that is why they were more profitable than small banks. These findings are in line with the RBV theory which asserts that the firm that owns more resources will have a better performance compared with the bank with few resources. These findings also confirm the claims made by IMF (2016) that large banks in Tanzania are in a relatively healthy position than smaller banks which appear to face challenges. These findings are also in line with statistics from [BoT, BoT, BoT, BoT] (2009, 2012, 2014 and 2015) which indicate that large banks are more profitable than smaller ones.

4.2.1 Stability of CBs in Tanzania

The trends about the stability of CBs in Tanzania which were measured using Z-score and the ratio of NPL/TL are presented in Figure 3 and 4 respectively. The findings with regards to stability of CBs in Tanzania by Z-score indicate that small banks were more stable than large banks for the year 2006-2009 and 2011. The mean value of Z-score for small and large banks ranged between 2.96 and 3.77 and 2.84 and 3.71 respectively. The trend shows that Z-score for the whole sector was positive for the whole period under study ranging between 3.08 and 3.46. Z-score can be zero, greater than zero or less than zero. Musau (2018) pointed out that a Z-score less than zero (i.e., negative) indicate that the bank has no enough capital to absorb losses, thus it is unstable; zero Z-score implies that the bank has an adequate capital to just cover the losses and a positive Z-score shows that the bank has enough capital to absorb any losses that might arise, thus it is stable. Thus, CBs in Tanzania were stable since the values of Z-score was positive. The improvement of Z-score seen in large banks since 2010 was possibly due to the increase in the capital-to-total assets ratio. It must be noted that in 2010 BoT increased the minimum capital requirement for CBs from TZS 5 billion to TZS 15 billion. This might be the reason for the improvement of Z-score in large banks since 2010.

These findings contradict with the competition fragility theory which suggests that large banks will always be unstable when the banking sector is concentrated. It was seen that Z-score between large and small banks were not significantly different with 6 out of 10 years, large banks being stable than smaller ones. This might be due to the fact that the calculation of Z-score involves the values of bank's total assets and capital which are high in large banks. That is why, the insolvency risk of large banks was not different from small banks.

The findings on stability by NPL/TL indicate that large banks were less stable compared to small banks as they recorded higher ratio of NPL/TL for the whole period under study except in 2009, 2012, 2014 and 2015. This means that the proportion of borrowers who defaulted their loans repayment were higher in large banks compared with small banks. This is in line with the competition fragility theory whereby large banks are expected to take more

risk compared with small banks because of the notion that they are too big to fail. This might indicate that large banks are taking excessive credit risks by lending more to sectors which are too risky such as real estate and agriculture compared with small banks which lend less to such sectors (BoT, 2014). The findings about the ratio of NPL/TL for the entire sector indicate that the mean value was ranging between 7.34% and 4.66%. According to BoT (2014), the industry target limit of this ratio should be 5%. Based on this target limit, most of CBs in Tanzania had the ratio of NPL/TL above the target limit of 5%.

4.3 Analysis of the causality between stability and profitability of CBs in Tanzania

The causality between stability and profitability of CBs in Tanzania was analysed using the Granger causality test in heterogeneous panels. This test was carried out using 1 as the number of Lag. Dumitrescu and Hurlin (2012) and Lopez and Weber (2017) documented that the number of Lag used in this test depends on whether T is greater than (5+3K) or not. Where K is the Lag order and T is the number of years of panel data. Since T was 10 and the total of (5+3K) was equal to 11, Lag (1) was used. This test indicates that there is a causality between two variables when the P-value for Z-bar statistics is ≤ 0.05 (Lopez and Weber, 2017). The findings concerning Dumitrescu and Hurlin (2012) Granger causality test are presented in Table 2.

The findings indicate that ROE does positively granger cause Z-score in both small and large banks. The findings also indicate that Z-score does positively granger cause ROE in both small and large banks. In other words, there is a bidirectional relationship between ROE and Z-score in large and small banks. With regards to these variables, the findings confirm to the positive view given by Swamy (2018), Allen *et al*. (2011), and Mehran and Thakor (2011) who noted that bank stability improves bank profitability as the willingness of shareholders to take excessive risks are reduced. The findings with respect to ROE and the ratio of NPL/TL indicate that ROE does granger cause the ratio of NPL/TL in small and large banks. This implies that past values of ROE can be used to predict the values on NPL/TL in small and large banks. This could be possibly due to the fact that as banks' management try to increase the profit to owners of the bank, they take excessive credit risk. That is, they compromise their lending standard which results into higher credit risks. The findings also indicated that credit risk (measured using the ratio of NPL/TL) does granger cause positively ROE in small banks while does not granger cause ROE in large banks. This is possibly caused by the fact that loans are almost the only sources of income that is why their past ratios of NPL/TL can be used to predict their ROE. The findings concerning ROA and Z-score show that there is a bidirectional relationship between ROA and Z-score in small banks. ROA was found to granger cause Z-score in large banks while Z-score was found not to granger cause ROA in large banks. Lastly, findings with respect to ROA and the ratio of NPL/TL indicate that ROA does not granger cause the ratio of NPL/TL in both small and large banks. The interpretation of this is that past values of credit risk cannot be used to predict ROA of small banks because some of borrowers will always default and the bank can deal differently with borrowers in the consecutive years thus the prediction among variables is not clear.

Most of the findings of Granger causality test partly agreed with the uncertainty bearing theory of profit while a few disagreed. For instance, the positive bidirectional causality between ROE and Z-score in both large and small banks contradict with the uncertainty bearing theory of profit which suggest that the bank which is facing higher uncertainties or uninsurable risks (in this case insolvency risk) is more profitable than a firm which faces lower risks. The disagreement between the findings of this study and the arguments put forward by the uncertainty bearing theory of profit might indicate two major limitations of this theory. Firstly, there is a possibility that this theory is not applicable in all situations of the business world. Secondly, there is a possibility that uncertainty bearing is not the only factor influencing profitability. Part of the findings which indicated that past value of profitability can be used to predict the future value of stability and vice versa is in line with the findings of Tan and Anchor (2016), Alharthi (2016), Mollah and Zaman (2015), Mamatzakis *et al.* (2015), Anginer *et al*. (2014), and Fu *et al*. (2014) while are disagreeing with Stovrag (2017) and Apergis (2014).

5. CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

The study examined the trends of bank profitability and stability and analysed the causality between profitability and stability of CBs in Tanzania. The findings with regards to the profitability of CBs in Tanzania indicated that

large banks were more profitable than small banks for the whole period under study. This was in line with the RBV theory which asserts that the bank with superior resources will have superior performances. For the bank stability, the findings indicated that Z-score of both small and large banks were almost the same thus the competition fragility theory were not validated. The trend with respect to the ratio of NPL/TL which were measuring credit risk indicated that large banks were facing higher credit risk than small banks for almost all period under study. This was in line with the competition fragility theory. Lastly, the findings with concerning granger causality test indicated that there a bidirectional relationship between ROE and Z-score in large and small banks. The study also found that ROE does granger cause the ratio of NPL/TL in small and large banks while the ratio of NPL/TL was found to granger cause ROE in small banks. The findings respecting to ROA and Z-score indicated that there is a bidirectional relationship between ROA and Z-score in small banks. Furthermore, ROA was found to granger cause Z-score in large banks while Z-score was found not to granger cause ROA in large banks. The findings about ROA and the ratio of NPL/TL indicate that ROA does not granger cause the ratio of NPL/TL in both small and large banks while the ratio of NPL/TL does granger cause ROA in small banks. Lastly, the ratio of NPL/TL does not granger cause ROA and ROE in large banks.

5.2 Recommendations

The bidirectional relationship between ROE and Z-score in large and small banks inform that banks in Tanzania should strive to increase both ROE and Z-score since they do cause each other. A bidirectional relationship between ROA and Z-score in small banks implies that the profitability and stability in small banks cause each other. Thus, the study recommends that the management of small banks should aim to simultaneously accomplish both as they cause each other. The fact that the NPL/TL was causing ROA and ROE in small banks implies that loans are almost the only source of income for small banks that is why NPL/TL do cause their profitability. The study recommends that, small banks should be keener on how to manage their loans and should expand their activities to earn more non-interest income which would ensure their stability even when their loan portfolios are not performing well. Furthermore, the study recommends that large banks should not take excessive credit risk as this tendency might cause the whole banking sector to fail.

Table 1: Levin-Lin-Chu unit-root test for bank's stability and profitability

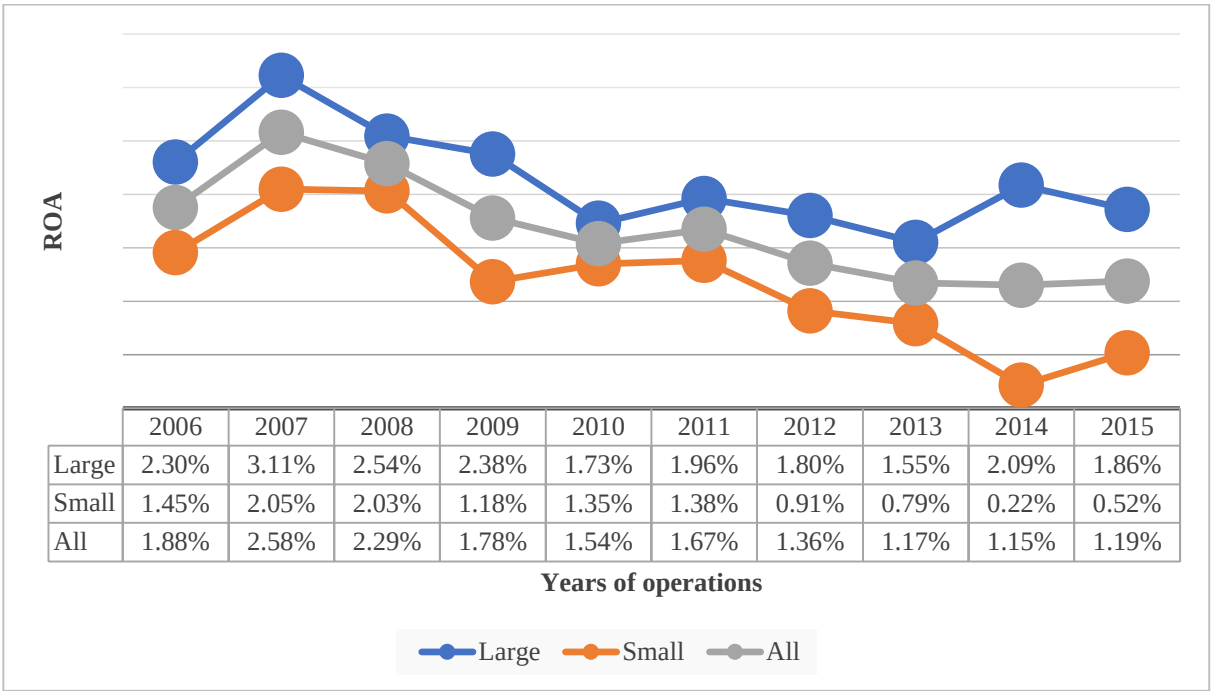
	Statistics			**ADF regressions**
Variable	**Unadjusted t**	**Adjusted t***	**p-value**	
Z-score	-9.2474	-4.0295	0.0000	1 Lag
NPLs	-7.9622	-3.4628	0.0003	1 Lag
ROE	-8.8133	-3.5505	0.0002	1 Lag
ROA	-7.6987	-2.7961	0.0026	1 Lag

Notes:

1. Number of panels = 22
2. Number of periods = 10
3. LR variance: Bartlett kernel, 6.00 lags average (chosen by LLC)
4. Asymptotics: N/T -> 0
5. AR parameter: Common
6. Panel means: Included
7. Time trend: Not included

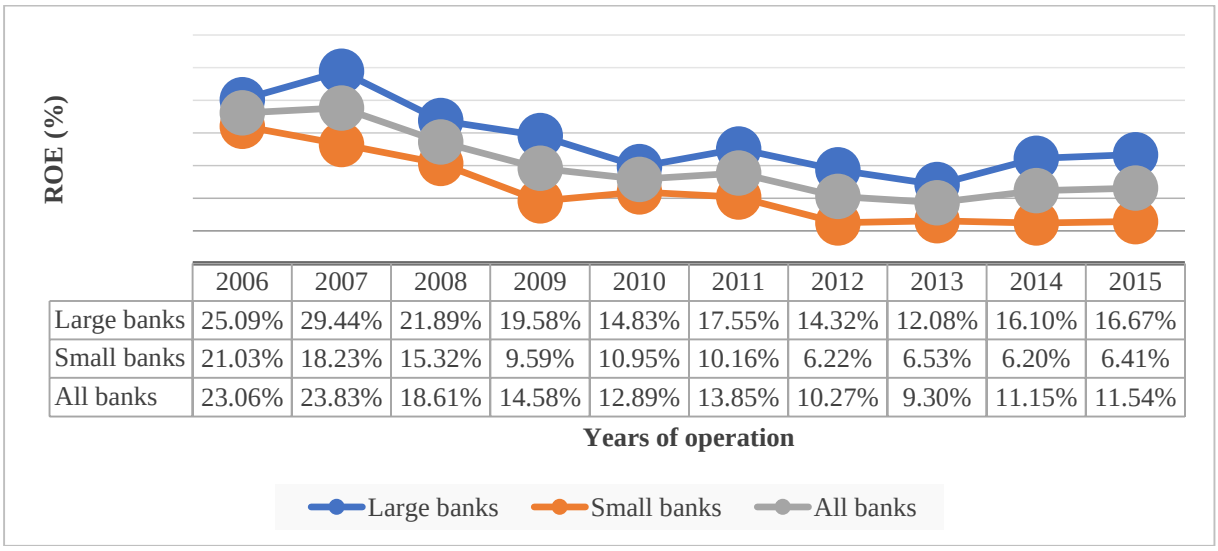
Table 2: Dumitrescu and Hurlin (2012) Granger non-causality test results

Null hypothesis	W-bar statistics	Z-bar statistics	p-value
Model 1: Small banks			
ROE does not Granger cause Z-score	1.7671	1.9558	0.0005
Z-score does not Granger cause ROE	3.9121	7.4243	0.0000
ROE does not Granger cause NPL/TL	2.2127	3.0919	0.0020
NPL/TL does not Granger cause ROE	3.0955	5.3426	0.0000
ROA does not Granger cause Z-score	2.0149	2.5876	0.0097
Z-score does not Granger cause ROA	3.7599	7.0365	0.0000
ROA does not Granger cause NPL/TL	1.3893	0.9924	0.3210
NPL/TL does not Granger cause ROA	2.6131	4.1126	0.0000
Model 2: Large banks			
ROE does not Granger cause Z-score	2.9655	4.1695	0.0000
Z-score does not Granger cause ROE	1.9358	1.9851	0.0471
ROE does not Granger cause NPL/TL	2.1229	2.3819	0.0172
NPL/TL does not Granger cause ROE	0.8702	-0.2754	0.7830
ROA does not Granger cause Z-score	4.2529	6.9005	0.0000
Z-score does not Granger cause ROA	1.7126	1.5116	0.1306
ROA does not Granger cause NPL/TL	1.9005	1.9103	0.0561
NPL/TL does not Granger cause ROA	1.2453	0.5204	0.6028



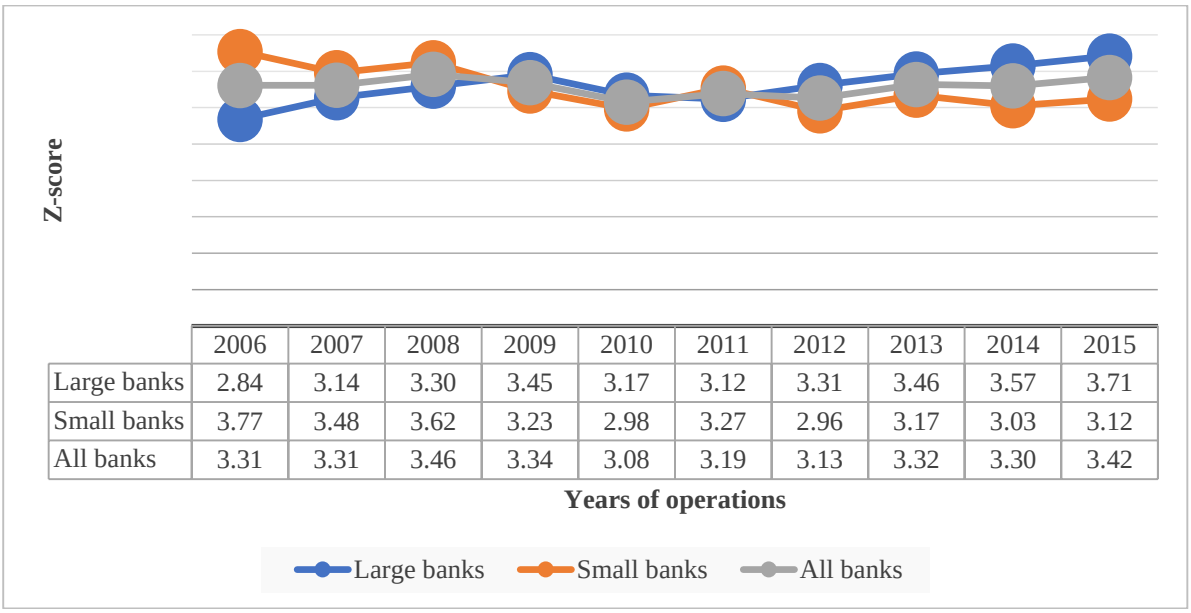
	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Large	2.30%	3.11%	2.54%	2.38%	1.73%	1.96%	1.80%	1.55%	2.09%	1.86%
Small	1.45%	2.05%	2.03%	1.18%	1.35%	1.38%	0.91%	0.79%	0.22%	0.52%
All	1.88%	2.58%	2.29%	1.78%	1.54%	1.67%	1.36%	1.17%	1.15%	1.19%

Figure 1: ROA of CBs in Tanzania



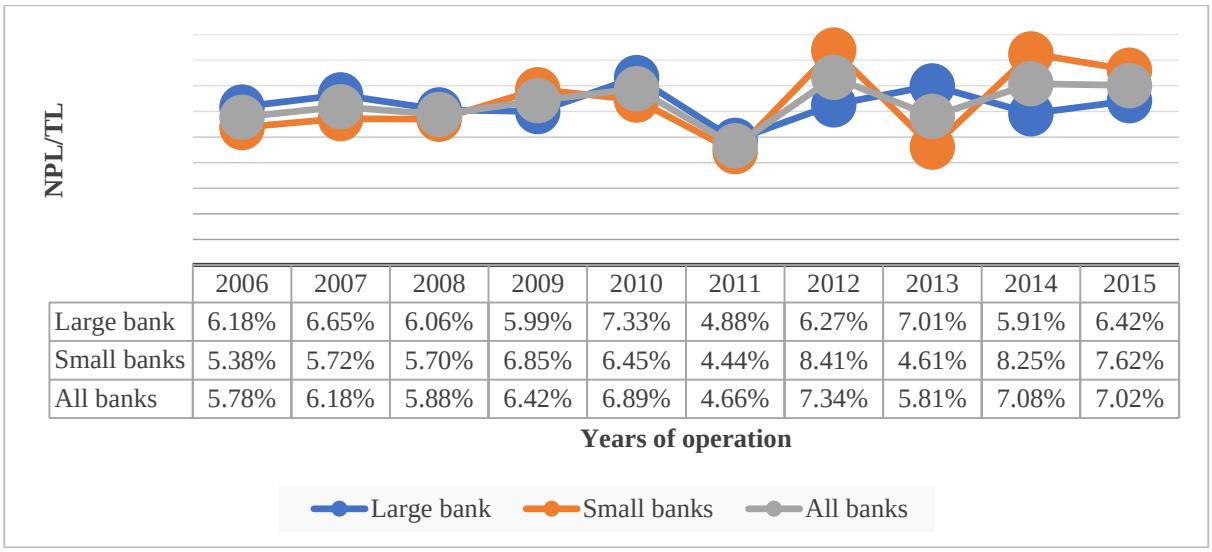
	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Large banks	25.09%	29.44%	21.89%	19.58%	14.83%	17.55%	14.32%	12.08%	16.10%	16.67%
Small banks	21.03%	18.23%	15.32%	9.59%	10.95%	10.16%	6.22%	6.53%	6.20%	6.41%
All banks	23.06%	23.83%	18.61%	14.58%	12.89%	13.85%	10.27%	9.30%	11.15%	11.54%

Figure 2: ROE of CBs in Tanzania



	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Large banks	2.84	3.14	3.30	3.45	3.17	3.12	3.31	3.46	3.57	3.71
Small banks	3.77	3.48	3.62	3.23	2.98	3.27	2.96	3.17	3.03	3.12
All banks	3.31	3.31	3.46	3.34	3.08	3.19	3.13	3.32	3.30	3.42

Figure 3: Z-score of CBs in Tanzania



	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Large bank	6.18%	6.65%	6.06%	5.99%	7.33%	4.88%	6.27%	7.01%	5.91%	6.42%
Small banks	5.38%	5.72%	5.70%	6.85%	6.45%	4.44%	8.41%	4.61%	8.25%	7.62%
All banks	5.78%	6.18%	5.88%	6.42%	6.89%	4.66%	7.34%	5.81%	7.08%	7.02%

Figure 4: The ratio of NPL/TL of CBs in Tanzania

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