Efficiency and Non-Performing Loans in Community Banks in Tanzania
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Abstract

The study was carried out on the basis that Bank efficiency studies have concentrated on Traditional Commercial Banks (TCBs), and mainly in developed countries. This has called for this study which examined bank efficiency measures and their link with Non-Performing Loans (NPLs) in a small community banking industry in Tanzania. Specifically, the study;

- measured the efficiency score of Community Banks (CBs) in Tanzania in a multiple-input/output framework and analysed the impact of bank specific and regulatory factors on bank efficiency,
- determined the main factors leading to accumulation of NPLs among CBs,
- established the relationship between cost efficiency and NPLs in CBs, and
- established the relationship between efficiency measures and NPLs threshold in CBs

The study was governed by various three theories for robust guidance in execution of the objectives.

- X-efficiency theory of the firm

The X-efficiency describes the general efficiency of a firm in transforming inputs into outputs. In this theory, some assumptions are criticized that firms maximize profit; rather many of them tend to maximize managerial-utility instead. The study identified two possible sources of inefficiency. One was a divergence between price (marginal benefit) and marginal cost, named allocative inefficiency. This divergence may be caused by monopoly, taxes, regulations and other impediments to competitive output rates. Another was labelled X-inefficiency which stems from the failure of businesses to achieve the lowest possible cost functions for producing their goods, and this can account for wasted resources. Within the X-inefficiency theory, non-maximising behaviour as the key idea of X-inefficiency exists. The degree of X-inefficiency is primarily determined by the level of effort of individuals within the firm. The problem of principal–agent relationships is an important source of X-inefficiency. Accordingly, due to the feature of incomplete contingent contracts between principals and agents, agents can evade the consequences of cost overruns and have no motivation to keep costs down. Then firms will be more X-inefficient. X-inefficiency seeks to analyse intra-firm behaviour and relations and interactions of people within the firm, rather than the working of the price system. Given that the study intended to measure CBs efficiency and uncover inefficiencies, this theory was used to guide the researcher in identifying the key source of inefficiency in CBs. While X-inefficiency theory posits that the key source of inefficiency is non-maximizing behaviour of managers, this study sought to confirm whether the results in CBs were consistent with X-inefficiency theory.

- Agency theory of the firm

Agency theory apart from discussing the principal-agent relationship, it also explained managerial behaviour. Managerial theories argue that, although managers are always subject to some kind of profit constraint, the controlling management group will pursue their own interests and utility, rather than firm efficiency maximization. For example, firm's managers are most likely to seek those objectives from which they obtain prestige, power and greater personal monetary reward. In so doing, costs may not be minimized and a level of organizational slack would be built into the system

In the principal-agent context, the firm was considered as a link of contracts between a firm, the principal, and its subcontractor, the agent. In the firm, the principals (owners) cannot have full knowledge and information about the firm's operation and performance capabilities, while the agents (managers) have more information or knowledge than the principals. The existence of asymmetric information and uncertainty leads to a problem of "hidden action" or moral hazard behaviour.

The agency theory was relevant particularly to Tanzanian CB's efficiency and NPLs studies. Some managers in CBs are likely to take advantage of information asymmetry to accumulate powers and prestige at their advantage and spend bank resources over and above the optimal level, leading to inefficiency. Moreover, because of the quest for power or possibility of laxity in the loan evaluation process, the agents (bank managers) may lend unprofessionally to bad risk borrowers who are likely to default, resulting in huge NPLs and operational losses. As it was informed before, CBs in Tanzania appear in two categories, namely CCBs and NCCBs. The kind of ownership and governance mechanisms between the two categories differ, which reflects the extent of insurable interest of the owners. This, in turn, may have an impact on efficiency and NPLs levels in each bank category. Using the framework of Principal-Agent relationship, this study evaluated the level of efficiency and the incident of NPLs in the bank categories.

- Joint liability contract theory

The joint liability contract theory on lending to poor communities borrows from the transaction cost-based theories and asymmetric information problems. The transaction cost theory argued that, under many circumstances, it is only slightly more expensive to administer a group of n loans than to administer a single loan. Given that the difference between administering a group loan and a single loan is small, it implies that many loans administered under group lending approach led to a reduction in transaction costs per loan. If the projects to be financed are simple and similar in terms of their characteristics, the time path of their returns, and the geographical location, putting them together in groups can serve on loan processing, screening and monitoring costs. This was the basic idea of group lending methodology in serving low-income borrowers. Similarly, when poor borrowers form groups and are held liable for each other, lending to the poor can be cost-effective and less risky even if borrowers do not possess official collaterals and/or lack a credit history (Lehner, 2009).

The study narrated that for borrowers in a non-cooperative community bank, however, they are only jointly liable for their group debts but have no financial responsibility for the bank debts. This implied that the joint liability contract would be stronger in CCBs than in NCCBs because borrowers are liable not only to the group but also to the lender as well. The double joint-liability in CCBs' borrowers would theoretically imply that CCBs are better positioned to effectively screen and monitor their loans. Although the joint liability feature associated with group lending lowers the risk of default, it may create a free-riding problem as it has been elucidated before. Unless the group can effectively manage the free-riding attitude, the whole idea of group lending in CCBs can succumb to failure.

- This study covered a period of 13 years (2002-14), the sampled banks and sample size per Year were Mufindi Community Bank (1998); Kilimanjaro Cooperative Bank (1996); Mwanga Community Bank (2002); Kagera Farmers Cooperative Bank (2002); Mbinga Community Bank (2003); Uchumi Commercial Bank (2005); Tandahimba (2009), Efatha (2009) and Njombe (2010).The sample size per year is as follows: 4

(2002), 5 (2003), 5 (2004), 6 (2005), 6 (2006), 6 (2007); 7 (2008); 8 (2009); 9 (2010); 9 (2011); 9 (2012); 9 (2013); and 9 (2014) making a total of 92-bank year observations.

- The study employed an explanatory sequential research design. The study utilized Data Envelopment Analysis (DEA) to measure efficiency, while tobit and probit regressions were used to model relationships among variables, and applied the Stata 11.1 software to analyse quantitative data.

On Performance of Community Banks in Tanzania which was based on Analysis of Efficiency Status, the study found that;

- Except for Scale Efficiency (SE), CBs in Tanzania generally exhibited low efficiency levels. Cost efficiency was the lowest at an average of 35.5 % over the study period. This implies that CBs in Tanzania could produce the same outputs with approximately 64.5 % less costs than they incurred.

- Low CE seemed to suggest unpleasant short-term effects of additional expenses incurred to render social support services to poor bank clients on one hand, and the incident of excessive regulatory burdens on the other hand.

- Despite the general low efficiency, CBs in Tanzania were operating at a decreasing part of the average cost curve, providing some optimism that CBs in Tanzania were on the right trend to recovery.

- Evidence from some key informants indicated that CBs in Tanzania were vibrant enough to compete and maintain their market share, especially in the rural areas. Given that CBs possessed valuable information in dealing with informationally-opaque borrowers, extending their services in the low-income segment and especially in the rural financial market would enhance their competitive edge over the Traditional Commercial Banks (TCBs) which are currently showing interest in the low-income market segment.

- CBs could enhance their CE by increasing the use of group lending methodology. Except for SE, the other efficiency measures seemed to mirror the cost efficiency trend. Technical efficiency under Constant Return to Scale (TeCRS) and under Variable Return to Scale (TeVRS) were 63.4% and 69.8% respectively. Allocative Efficiency (AE), which measures the ability of banks to allocate input resources to the most beneficial outputs, averaged at 51.9%, while SE, which accounts for the optimal use of production capacity was at an average of 91.9% over the study period. From the findings it was evident that overall cost inefficiency in CBs in Tanzania wasmore associated with inability of CBs to allocate input resources to the most beneficial outputs (allocative inefficiency) than failure to optimize output from existing inputs.

- On applying Tobit model to analyse the determinants of efficiency in CBs, it was also found that bank size, loan to total assets ratio, the ratio of labour cost to non-interest capital and administrative related expenses and capital adequacy ratio impacted efficiency in CBs.

- It was also found that Net interest margin (Nim) was negatively associated with CE, implying that CBs were charging higher margins to compensate for the development social costs they incurred in supporting the poor clients. However, by setting higher interest margins it compromised instead of supporting CBs' CE.

- The study also applied the independent sample t-test to compare efficiency between Cooperatives based Community Banks (CCBs) and Non-Cooperative based Community Banks (NCCBs). The findings indicated that there was no significant difference in efficiency between the two bank categories, probably because of the application of uniform regulatory framework which levelled out the uniqueness within CBs categories.

The results on determinants of non-performing loans in community banks in Tanzania revealed that;

- Using explanatory sequential research design, the study applied panel data regression and also made use of key informant interviews to validate findings generated by the panel data. The findings established that NPLs have had an upward trend, with a sharp increase in 2007-09 seemingly associated with effects of global financial crisis.
- Overall; it was found that a strong relationship between NPLs ratio and bank level and GDP factors. The relationship was positive with Net interest rate margin (Nim) but negative with capitalization and loan to assets ratios.
- The association with a cooperative banking factor was also positive, defying the Joint Liability Contract (JLC) theory but consistent with the Agency Theory (AT).
- The effect of macroeconomic variables presented a more interesting result. Although the effect of inflation and market lending rates were negative but insignificant, the effect of GDP on NPLs ratio was positive and significant, which is at variance with the generally accepted knowledge that a healthy economy is associated with low levels of NPLs. The inconsistency might be explained in terms of increasing risk-taking behaviour of banks to finance a "hot" growing economy and increasing competition in serving the same clients, leading to some borrowers taking multiple loans to take advantage of a weak legal system and lack of fully-fledged credit bureaus.
- Another possibility accounting for the inconsistence could be a lop-sided nature of the Tanzanian economy whereby only a few sectors of the economy have a high contribution to the GDP.Thus the GDP in those sectors which are served by CBs might not have contributed significantly to the average GDP currently observed in Tanzania.

The link between cost efficiency and non-performing loans in community banks in Tanzania. Using explanatory sequential research design and applying Tobit simultaneous regression model to explore the relationship between CE and NPLs ratio, it was established that;

- The relationship between CE and NPLs ratio was bi-directional and negative confirming the effects of bad management and bad luck hypotheses on the incidence of NPLs in CBs. However, the bad luck hypothesis was more influential on the occurrence of NPLs accumulation in CBs with a larger coefficient of 0.43 as compared to 0.077 for bad management. The results were upheld when the study was extended backward to incorporate bank data from the year 1999. This implies that bad luck contributed more to NPLs accumulation (which subsequently resulted into low-cost efficiency) than bad management.

- The dominance of bad luck over bad management was supported by the fact that the global financial crisis of 2007-09 had a serious negative impact on CBs' NPLs. CBs in Tanzania as opposed to other banks, are the ones highly involved in financing agricultural–based export including coffee and tea production in Tanzania.
- Due to low prices fetched on agricultural export as a result of the global financial crisis, most of the borrowers could not repay their loans on time, while others defaulted altogether, resulting in accumulation of NPLs in CBs.

Efficiency and non-performing loans threshold in community banks in Tanzania as executed using a probit model and applying Adjusted Prediction at Representative values (APRs) and Marginal Effects at Representative values (MERs) for continuous and categorical variables respectively, it was established that;

- Technical efficiency under Constant Return to Scale (TeCRS) increased chances to NPLs threshold, while Scale Efficiency (SE) and technical efficiency under Variable Return to Scale (TeVRS) decreased the probability to NPLs threshold in CBs.
- CBs that started in the second phase of the financial reforms in Tanzania (NCCBs2) exhibited higher chances to NPLs threshold, followed by Non-Cooperative Community Banks (NCCBs1) that were established in the first phase of the financial reforms, while the Cooperative Community Banks (CCBs) exhibited the lowest chances to NPLs threshold.
- The second banking reform which focused on efficiency and financial inclusion was more effective in terms of driving CBs to NPLs threshold than the first-generation reform.

Generally, the results of this study were consistency with empirical findings and the theories.

- The results indicate that Cost Inefficiency (CIE) in CBs is associated with Allocative Inefficiency (AIE) rather than Technical Inefficiency (TIE) and Scale Inefficiency (SIE). Factors such as development costs incurred to support poor clients and excessive regulatory burdens imposed on CBs could possibly explain the divergence from the X-efficiency theory.
- Moreover, arising from AT, it was assumed that the level of interest at stake determines the level of control/monitoring to be exerted by the stakeholders. Following this, it is implicit that non-Cooperative based CBs (NCCBs) should have better efficiency and NPLs performance than Cooperative-based CBs (CCBs). The findings however, indicate that there was no difference in efficiency between the two community banks categories. This implies that the findings negate the claim of the AT. The inconsistency with the AT could possibly be explained by the application of uniform banking regulations across all banks which does not give room for practising of unique monitoring efforts in various categories of CBs.
- Two theories namely Agency Theory (AT) and Joint Liability Contract Theory (JLCT) were applied to analyse the difference in NPLs performance between CCBs and NCCBs. The findings on NPLs performance indicate that the mean NPLs ratio between NCCBs and CCBs was significantly different, with NCCBs performing significantly better than CCBs. These findings were consistent with AT that high-interest stake holders in NCCBs were keener to monitor management, resulting in lower NPLs.
- Moreover, the AT was also used to explain the possibility of NCCBs having higher probability to NPLs threshold than their counterpart CCBs. On the other hand, according to JLCT, CCBs were also expected to exhibit higher chances to NPLs threshold due to double joint liability in CCBs. The results were consistent with AT; but were inconsistent with JLCT. The inconsistency with JLCT could possibly be explained by the fact that group lending methodology in Tanzania provides advantage not only to CCBs but also to NCCBs as it is applied by both bank categories. Moreover, the double joint liability in CCBs is not ardent enough to give CCBs an advantage over NCCBs due to excessive empathy and free–riding in CCBs' members in the Tanzanian context

The study posed tangible policy implications in different dimensions;

✓ Addressing low efficiency

To tackle low-cost efficiency in CBs, bank supervisors should direct CBs management in to be cost-effective in the use of CBs resources. Similarly, in dealing with excessive regulatory burdens, BOT should formulate a separate regulatory framework that accommodates unique characteristics of CBs. Secondly, BOT should enforce banking guidelines that require CBs to increase not only their assets size but also the proportion of loans to total assets. As regards the

negative association between net interest margin and cost efficiency, CBs management should revise pricing policy with the aim of reducing price margins or increase interest on deposit as higher interest margins are counterproductive to efficiency. Thirdly, on the positive relationship between capitalization and efficiency, BOT should enforce capital adequacy regulation of 2014 which requires all CBs to raise their core capital to TZS 2.0 billion by 2018. CBs could raise their capital by selling shares to investors such as local governments in their places. Further, to improve on their capital, CBs could also link with rural institutions such as SACCOS and VICOBA in order to take advantage of the rural financial markets.

✓ Addressing increasing NPLs

In dealing with accumulation of NPLs, it was recommended that the regulators (BOT)should enforce prudential lending behaviour to avoid unnecessary accumulation of NPLs, especially during this period of fast-growing economy when the lending and borrowing tempo is high. Increasing capital adequacy ratio was recommended in order to control excessive risk-taking behaviour in small banks. Secondly, CBs management should revise downwards their lending rates or increase their deposit rates as higher interest margins are positively associated with NPLs ratios. Thirdly, as the problem of increasing NPLs appears more pronounced in CCBs than in NCCBs, it was recommended that the bank supervisors should increase their supervision to CCBs in order to control higher incidents of NPLs in CCBs. Fourthly, information sharing credit bureau facility needs to be availed to smaller banks as well to enable them control the increasing multiple loans behaviour among borrowers.

✓ Addressing the link between cost efficiency and NPLs

To deal with the effect of bad luck on increasing NPLs in CBs, it was recommended that bank supervisors in the BOT, should limit CBs risk exposure by controlling excessive risk taking and loan concentration. Moreover, bank supervisors should direct banks to diversify in various sectors of the economy in order to avoid "putting all eggs in one basket". Secondly, on the effect of bad management which is a reflection of low-cost efficiency, bank regulators should provide training to bank managers and staff aimed at enhancing cost–effectiveness sprit that eventually leads to cost efficiency

✓ Addressing the effect of efficiency measures on NPLs threshold

On the effect of technical efficiency under Constant Return to Scale (TeCRS) to NPLs threshold, it was recommended that the CBs Management should increase CBs capacity to deal with small borrowers, particularly by applying group lending methodology. On the effect of Scale Efficiency (SE) to NPLs threshold, CBs management should limit excessive increase of the number of borrowers in CBs in order to match with the standard workload of the loan officers. Alternatively, they should engage more loan officers and improve on working facilities and moderate excessive skimping practices. As for the effect of bank category on NPLs threshold, it was recommended that bank regulators should increase regulatory efforts in supervising CCBs in order to increase their chances to NPLs threshold. The normative recommendation on the findings that CCBs have lower chances to NPLs threshold is that bank regulators, in collaboration with the Commission responsible for co-operative banking in Tanzania and trainers in cooperative education should provide training aimed at creating responsible membership in CCBs in order curb free-riding attitude which apparently accounts for low probability to NPLs threshold in CCBs.

Contribution of the Research on the body of knowledge; this study was an attempt to fill the knowledge gap by evaluating performance in terms of measuring efficiency and examining the relationship between efficiency factors and NPLs in CBs in Tanzania. The findings indicated

that, although efficiency of CBs was generally low, CBs have potential to perk up their efficiency through adopting lending methodologies that improve cost saving and by entrenching themselves in the rural financial markets where they have accumulated experiences in dealing with information opacity-a competitive advantage over TCBs and other conventional banks. At a knowledge level creation, this study adds a new dimension of efficiency-NPLs literature by involving little researched community banking sub-sector especially in the wake of financial sector reforms in a developing country.

Specifically, this study contributes in two major fronts: first, the study provides a comparative analysis of efficiency and NPLs performance between various categories of CBs, particularly examining the effect of the cooperative banking factor on efficiency and NPLs performance. Investigating the effect of CBs categories is important in order to inform prospective policy decisions. Second, contrary to previous studies which have investigated bank efficiency and NPLs relationship based on Cost Efficiency (CE) and NPLs parameters as per the traditional Berger and DeYoung framework, this study, apart from applying the traditional framework, also employed a broader set of efficiency measures to study the relationship between efficiency and NPLs. Particularly, one of the major innovations of this study was the investigation of the effect of various efficiency measures and bank categories on the NPLs threshold. Grasping the effect of efficiency measures and bank categories on NPLs threshold is important in order to establish how various efficiency components impact on the probability of banks to operate within the NPLs industry average. Further, the effects of bank categories on NPLs threshold are important for informed policy solutions.

In terms of methodological approach, this study provides an alternative method of determining NPLs ratio threshold. Traditionally, the rule of thumb on the NPLs ratio threshold has been 5% worldwide which, in a way, seems static and does not consider the actual situation prevailing within the individual banking systems in various countries. Thus, in order to present a realistic NPLs ratio situation in the Tanzanian banking market, it was considered more prudent to use a representative NPLs ratio threshold of the Tanzanian banking industry. Accordingly, a representative NPLs threshold ratio was calculated as an average of the sum of end of year industry average NPLs ratio over the study period.

At a theoretical level, this study provided evidence that X-inefficiency in CBs originates mainly from Allocative Inefficiency (AIE) as opposed to Technical Inefficiency (TIE), thus extending a new dimension on the X-Efficiency theory in CBs. The inconsistency might be accounted for by the fact that CBs in Tanzania (and probably all over the world) apply a significant part of their cost resources to provide development services the return of which were not accounted for in estimating the financial efficiency. Moreover, CBs in Tanzania incur a considerable percentage of their cost to meet regulatory requirements, which, in a way, might contribute to this inconsistency. As for the Joint Liability Contract (JLC) theory, the results were also incompatible with the empirical findings. These findings provide a new insight in the application of JLC theory that, in places where cooperative bank members are empathetic and highly free-riding, the assumptions of the JLC theory might not work as expected. The results arising from this study add some knew knowledge on the performance and operations of CBs. This knowledge is important as an input to bank regulators and policy makers in taking actions that may influence the lives of low-income earners who benefit or are potentially likely to benefit from the services of a growing community banking industry in Tanzania.

Conclusion; generally, from the findings, the study concluded that:

- Most efficiency measures in CBs were low with overall Cost Inefficiency (CIE) being associated with Allocative Inefficiency (AIE) rather than Technical Inefficiency (TIE). It is also concluded that CBs size, loan to total assets ratio, capital adequacy ratio and the ratio of labour expenses to total non-interest expenses are major determinants of efficiency in CBs. Further, higher Net interest margins (Nim) were counterproductive to cost efficiency. Moreover, regardless of their categories, CBs had similar efficiency.
- Both bank level and macroeconomic factors impacted on the NPLs in CBs in Tanzania. Net interest margin (Nim) and GDP increased chances to NPLs while capitalization ratio and the ratio of loans to total assets were negatively related to NPLs in CBs. On the other hand, GDP was significantly negatively related to NPLs in CBs. It is also concluded that CCBs were significantly more prone to NPLs than NCCBs
- The relationship between CE and NPLs in CBs is two-way and negative, consistent with bad management and bad luck hypotheses. It is further concluded that the pile up of NPLs in CBs is more associated with bad luck rather than with bad management. The effects of uncontrollable factors, presumably the incident of the global financial crisis, had generally contributed to increase of NPLs in CBs in Tanzania.

Various efficiency measures exert differing impacts to NPLs threshold in CBs. TeCRS increases the probability to NPLs threshold while SE and TeVRS decreases chances to NPLs threshold. Moreover, the CCBs category exhibits the lowest chances to NPLs threshold compared with NCCBs2 and NCCBs1.