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Profitability and Intermediation Efficiency: Evidence from Deposit Taking Saving and Credit Co-operative Societies in Kenya

Peter Wang'ombe Kariuki[1*] Willy M. Muturi[1] PhD Patrick K. Ngugi[1] PhD
1. School of Business & Economics, Jomo Kenyatta University of Agriculture and Technology, Kenya
* E-mail of the corresponding author: p.kariuki3@gmail.com

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Abstract

In the recent past, the concept of efficiency has gained prominence as an alternative measure of firms' performance. Empirical evidence with respect to its relationship with the traditional measures of financial performance is scanty. The study sought to evaluate the relationship between profitability and intermediation efficiency of deposit taking SACCO societies (DTSs) in Kenya. The study adopted a two staged methodology. In the first stage, efficiency scores are generated using Data Envelopment Analysis (DEA), corrected for bias using bootstrapping and used as dependent variable in the fixed effect regression model estimated in the second stage. A balanced panel data of 103 DTSs for a period 2011-2014 was used in the study. The results indicate that there exists a positive significant relationship between profitability and intermediation efficiency. This reveals that most efficient DTSs were on an average characterized by higher profitability. This indicates that there exists goal congruence such that as the management strives to maximize the members' wealth through increased profitability, the efficiency also improves.

Key Words: *Data Envelopment Analysis, Deposit Taking SACCO, Intermediation Efficiency, Noninterest income, Profitability.*

1.0 Introduction

The paper sought to evaluate relationship between profitability and intermediation efficiency of deposit taking saving and credit co-operative societies in Kenya. The performance of financial institutions is an important determinant of economic growth, the allocation of capital, financial stability and the competitiveness and development of the manufacturing and service sectors (Goddard et al. 2008). Over the years, there has been overreliance of financial performance measures such as return on assets (ROA) and return on equity (ROE). However, the importance of financial institutions stems from their role as main channels of savings and allocators of credit in an economy. They collect and collate deposits from micro-savers and channel them to investors. This is the intermediation process which they must achieve efficiently (Arora 2014; Ndung'u 2010).

As a result of the aforesaid, the concept of efficiency has gained prominence as an alternative measure of firms' performance. Intermediation efficiency refers to mobilization of funds from surplus units and avail to deficit units with minimal or no wastage. It advocates for non-wastage of resources by emphasizing cost reduction while producing the maximum possible level of output for a given technology and available inputs (Sufian 2009). A stable and efficient financial system pools, transfers, and minimizes risks while at the same time increases liquidity and information sharing through the use of more sophisticated financial products and technology (CBK et al. 2012).

A closely related concept is that of productivity. Coelli, Rao, O'Donnell, and Battese (2005) argue that productivity of a firm refers to the ratio of the output(s) that it produces to the input(s) that it uses. Efficiency on the other hand refers to firm's ability to attain an amount of output with a minimum level of resources (Daraio & Simar 2007). It is described as a distance between the quantity of input and output, and the quantity of input and output that defines a frontier, the best possible frontier for a firm in its cluster (industry). Any producing unit is said to be technically efficient when it can produce the maximum amount of output using the given level of input, or it can produce a given level of output using minimum amount of input (Sharma et al. 2013).

The measures of efficiency are more accurate than those of productivity in the sense that they involve a comparison with the most efficient frontier, and for that they can complete those

of productivity, based on the ratio of outputs on inputs (Coelli et al., 2005; Daraio & Simar, 2007). Early efforts in the investigation of efficiency and its measurement were made by Koopmans (1951) and Debreu (1951). The was later advanced by Farrel (1957) who proposed that efficiency of a firm consists of two components; technical efficiency, which reflects the ability of a firm to obtain maximal outputs from a given set of inputs, and allocative efficiency, which reflects the ability of a firm to use the inputs in optimal proportions, given their respective prices. Due to challenges in determining the input prices in financial institutions, the technical efficiency is widely used as a measure of efficiency.

Savings and Credit Cooperative Societies (SACCOs) in Kenya

SACCOs (referred to as credit unions or financial co-operatives in other countries) are voluntary financial institution owned and operated by members for the purposes of promoting saving, providing cheap credit and providing other financial services to members. According to Olando, Mbewa and Jagongo (2012), SACCOs have solid bases of small saving accounts constituting a stable and relatively low-cost source of funding and low administrative costs. In addition, SACCOs have the ability and opportunity to reach clients in areas that are unattractive to banks such as rural or poor areas. Importantly, the core objective of cooperative societies is to ensure that their members are empowered through encouragement of savings and provision of credit (Khalayi et al. 2014).

Kenya has the largest and the most vibrant SACCO sector in Africa commanding 67% and 62% of the total assets and deposits/savings respectively in the African continent (SASRA, 2011). The SACCO subsector is classified as being in the transition phase (WOCC 2013). Ferguson and Mckillop (2000) used an organizational life-cycle methodology to partition credit unions into distinct growth phases; nascent (formative), transition and mature. Transition movements are characterized by large asset size, evolving regulatory and supervisory frameworks, less common bond restrictions, higher levels of product diversification, developed professional trade associations, less reliance on volunteers, developed central services and a greater emphasis on growth and efficiency.

According to SASRA (2013), the SACCO sub sector Kenya can be described as two-tiered given the range of financial services to members and regulatory regime. The traditional SACCOs described in law as non-deposit taking SACCOs provide a limited range of savings and credit products popularly referred to as back-office activities (BOSA). They are registered and supervised under the Cooperative Societies Act, CAP 490 and as such not required to register with SASRA. The deposit taking SACCOs (DTSs) besides the basic savings and credit products, also provide basic 'banking' services (demand deposits, payments services and channels such as quasi banking services commonly known as ATMs), FOSA and are licensed and supervised under the SACCO Societies Act, 2008. The SACCO societies operating FOSAs reflect near retail banking business operations (CBK et al. 2012). DTSs accounts for 78% and 77% of the total assets and deposits respectively of the entire SACCO subsector underscoring the fact that the growth potential for the SACCOs remains in the deposit taking SACCO business (SASRA, 2013).

2.0 Empirical Literature Review

Generally, the relationship between profitability and efficiency is expected to be positive since highly profitable SACCOs are less cost and profit inefficient (Srairi 2010). Empirically, there are mixed results, majority of scholars have reported a positive relationship between profitability and efficiency (Arora 2014; Maghyereh & Awartani 2014; Alrafadi et al. 2014; Othman et al. 2014; Srairi 2010; Sufian 2009). However, other scholars such as Gulati (2015) found a negative relationship while Awdeh and Moussawi (2009) found no relationship at all. The inverse relationship can be a pointer towards the prevalence of '*quite life*' hypothesis. According to Berger and Hannan (1998), in more concentrated markets, efficiency of banks worsen because the absence of competitive pressures results in lessened effort by managers to minimize costs. Managers can simply have a '*quiet life*', translating higher inefficiencies into higher prices.

Othman, Mansor and Kari (2014) assesed the performance of co- operatives in Malaysia using a data envelopment analysis approach with a sample of 56 out of the 70 co-operative groups. The productivity and efficiency scores were then regressed upon the co-operative variables (turnover, profits, members' equity and membership) using non-linear Tobit regression. The result showed that turnover, profit and equity were statistically significant in influencing the technical efficiency. The findings demonstrated that the bigger the co-operatives' turnover and profit, the higher the co-operative efficiency scores.

Arora (2014) used a balanced panel of 54 commercial banks operating in India during 1991–92 to 2006–07 to study the effects of reforms and ownership on bank efficiency. The efficiency scores were generated using DEA and both ANOVA and profitability analysis used to evaluate the determinants. The most efficient banks were found to be characterized by higher net profit as percentage of total assets (NPTA) and higher profits per employee (PPE). It was concluded that most efficient' banks were on an average characterized by higher profitability.

Alrafadi, Kamaruddin and Yusuf (2014) undertook a comparative analysis regarding the performance of 17 Libyan banks over the period 2004 to 2010 using DEA and Tobit regression. The results showed that the specialized banks exhibited higher mean technical efficiency relative to commercial and private banks. The results suggested that the ROA was positively related to bank efficiency, and the coefficient had a positive statistically significant relation to the technical efficiency score. This they attributed to the fact that more profitable banks are usually preferred by clients and therefore attract the biggest share of deposits as well as the best potential creditworthy borrowers. This creates a favorable environment for efficiency in the intermediation process.

Srairi (2010) used stochastic frontier analysis to investigate the cost and profit efficiency of 71 commercial banks in Gulf Cooperation Countries over the period 1999 to 2007. A comparative analysis between conventional and Islamic banks was done. On average, conventional banks were found to be more efficient compared to Islamic banks. The results indicated that the banks were more effective at generating profits than at controlling costs. A positive correlation between cost and profit efficiency with bank capitalization and profitability was found.

Awdeh and Moussawi (2009) undertook a study on bank efficiency and foreign ownership in the Lebanese banking sector for the period 1996 and 2005. In addition, they investigated the factors behind the efficiency differences. They concluded that there was no direct relationship between efficiency and profitability. Their argument was similar to that of Gulati (2015) that a bank may be efficient, but realizes low profitability, possibly due to large

expenditures on staff, IT, real estate, or else. On the other hand, an inefficient bank may enjoy high profitability due to high margins charged by that bank.

3. Methodology

3.1 Data envelopment analysis (DEA)

The study adopted a two staged methodology. In the first stage, data envelopment analysis (DEA) was used to generate efficiency scores. DEA is a multi-factor productivity analysis model for measuring the relative efficiencies of a homogenous set of decision making units (DMUs). It uses the principles of linear programming theory to examine how a particular DMU such as a DTS operates relative to other DMUs in the sample. The method constructs a frontier based on actual data. Firms on the frontier are efficient, while firms off the efficiency frontier are inefficient (Nasieku et al. 2013). Because efficiency is measured as the distance to this frontier, without considering statistical noise, DEA is a deterministic model (Andor & Hesse 2011).

Two different DEA models have been put forward; Charnes, Cooper and Rhodes (1978) proposed a model with an input orientation and assumed constant return to scale (CRS). Banker, Charnes and Cooper (1984) proposed a variable return to scale (VRS) model which was a variation of the CRS model. The paper adopted the VRS model which was solved using the DEA Computer Program Version 2.1.

3.2 Regression analysis

In the second stage of analysis, the efficiency scores are regressed against profitability. Other independent variables incorporated in the study include; asset quality, diversification and size to act as control variables. The following panel model was estimated;

$$TEFF_{it} = \alpha_0 + \beta_1 PROF_{\text{it}} + \beta_2 \text{ASQ}_{\text{it}} + \beta_3 DIV_{\text{it}} + \beta_4 SIZE_{\text{it}} + \varepsilon_{it}$$

Where i = 1,2, …,103, and t = 1,2,3,4

In the model, i stand for the i^{th} cross-sectional unit and t for the t^{th} time period. The dependent variable is the intermediation efficiency (TEFF) which is hypothesized to depend on profitability (PROF), asset quality (ASQ), diversification (DIV) and size (SIZE) for each DTS i on the sample over the 2011-2014 period of analysis.

ROA (return on assets) as measure of profitability was expected to enter the regression equation positively (Arora 2014; Maghyereh & Awartani 2014; Alrafadi et al. 2014; Othman et al. 2014; Srairi 2010; Sufian 2009). The ratio of non-performing loans provisions to total loans was used as a proxy of the asset quality or credit risk (Sufian 2009; Kiyota 2011). It is expected to have a negative coefficient implying a direct relationship between asset quality and efficiency.

Non-interest income to total assets was used as a proxy for DTSs' diversification strategy into non-traditional activities (Maghyereh & Awartani 2014; Sufian 2009). It was expected that the variable would have a positive coefficient indicating that diversification enhances efficiency. LNTA (natural logarithm of total assets) was used as a proxy of bank size to captures the possible cost advantages associated with size (economies of scale). The variable was expected to take a positive sign.

3.3 Data

The study used a balanced panel data of 103 licensed DTSs for the period 2011-2014. Though the study envisaged a census of all 135 DTSs licensed by the regulator at the close of 2013, complete data was available for 103 DTSs. The data was collected from DTSs' financial statements filed with the regulator, SASRA.

4. Results and findings

4.1 Descriptive Statistics of DEA Inputs and Outputs

The study adopted the intermediation approach of DEA since the focus was the intermediation efficiency. It sought to evaluate the efficiency with which DTSs collate member's deposit, capital and employ labour to advance loans to the members and also acquire investments for their benefits. Effectively, total deposits, labour cost and core capital were selected as inputs whereas gross loans and investments as outputs. Table 1 presents the descriptive statistics of these input and output. It can be observed that the mean deposits amounted to Ksh. 1.31billion with a standard deviation of Ksh. 2.46 billion. Labour cost had a mean of Ksh. 38 million with a standard deviation of Ksh. 63 million. The trend is the same for all other variables where the standard deviation is significantly higher than the mean which shows that the data is highly spread. This can also be seen from the difference between the maximum and minimum values. This indicates that DTSs included in the study differ significantly in their scale of operation.

Table 1: Descriptive Statistics of inputs and outputs

	Total deposits	Labour cost	Core capital	Gross loans	Investments
Mean (Ksh. Millions)	1,310	38	211	1,550	69
Median (Ksh. Millions)	492	16	77	547	19
Maximum (Ksh. Millions)	18,300	566	5,000	19,800	1,350
Minimum (Ksh. Millions)	0	1	-60	20	0
Std. Dev. (Ksh. Millions)	2,460	63	446	3,030	162
Skewness	4	4	6	4	5
Kurtosis	20	23	49	18	32
Observations	412	412	412	412	412

Bias corrected efficiency scores

The results of a regression model are only valid if basic assumptions of the regression analysis are satisfied. One such assumption is the assumption of independence within the sample. Simar and Wilson (1998) pointed out that efficiency scores generated by DEA models are clearly dependent on each other in statistical sense. The reason for dependency is the well-known fact that the DEA efficiency score is a relative efficiency index, not an absolute efficiency index. The calculation of the DEA efficiency of one DMU involves all other DMUs in the observation set (Xue & Harker 1999).

The presence of the inherent dependency among efficiency scores implies that the assumption of independence within the sample is violated. As a result, the conventional regression procedure is invalid. To address this issue, Simar and Wilson (1998) proposed a double bootstrap procedure, which enables consistent inference in the second-stage regression models. Casu and Molyneux (2003) concur that to overcome the problem of inherent dependency of DEA efficiency scores used in regression analysis, the bootstrapping technique should be applied. The bootstrap is a computer-based method for assigning measures of accuracy to statistical estimates. It is based on the idea of re-sampling from the original data to assign statistical properties for the quantities of interest (Sufian & Habibullah 2014). In this study, the bootstrapping was implemented using rDEA package embedded in statistical package R.

The summary of the results are shown in table 2. The results indicate that, in the year 2011, the Variable Return to Scale Technical efficiency (VRSTE) score was 0.646 where as the bias corrected VRSTE was 0.306. The trend where the VRSTE score are higher than the bias corrected score is replicated in all the years. This is expected since the DEA efficiency scores tend to be overstated due to sampling bias. According to Tziogkidis (2012), the DEA sampling bias is associated with the fact that the observed sample is (randomly) drawn from an underlying, unobserved population and the efficiency scores of the DMUs in the sample depend on the DMUs that define the frontier. This causes DEA efficiency scores to be overestimated compared to the "true" frontier, with the only highly unlikely exception that the DMUs which define the population frontier are all included in the sample. The bias corrected efficiency scores replaced the VRSTE for purposes of regression analysis.

Table 2: Summary of Bias Corrected Efficiency Scores

YEAR	VRSTE	Bias Corrected VRSTE
2011	0.646	0.306
2012	0.648	0.311
2013	0.706	0.403
2014	0.707	0.381
Average	**0.677**	**0.350**

4.2 Diagnostic tests

The panel data collected has both cross sectional and time series characteristics. Panel data pose several estimation and inference problems that plague cross-sectional and time series data. To overcome the problems, there are various estimation techniques that can be applied to panel data. This includes; pooled OLS, Fixed Effects Model (FEM) and Random Effect Model (REM). Diagnostic tests are used to identify the best model for the study. This section the study reports panel data diagnostics tests which were carried out.

Random Effect or Pooled OLS Model

According to Torres (2007), the Breusch-Pagan Lagrange multiplier (LM) test helps in deciding between a random effects regression and a simple OLS (pooled effects) regression. The null hypothesis in the LM test is that variances across entities are zero i.e. there are no significant difference across units (no panel effect). The Breusch Pagan LM test gave a χ^2 value of 43.27 (p=0.0000). This led to the rejection of the null hypothesis and a conclusion that the pooled effects (OLS) regression model was not appropriate for the study.

Random Effects or Fixed Effects Model

Breusch Pagan LM test showed that pooled effects model was not appropriate for the study. The appropriate model for the study was panel regression model which could either be random effects model (REM) or fixed effects model (FEM). Fixed effect regression modeling is more appropriate when the study seeks to examine the effect of independent variables over time. More so, the independent entity should be having a relationship with the independent variables. In contrast random effect model assumes that independent variables have no collinearity with independent entities. In addition, it assumes that there are random variations across the error terms and both independent variables and specific's entities are too treated as independent variables. To make a choice between random and fixed effects panel regression model, Hausman test was applied.

Hausman test basically tests whether the unique errors (u_i) are correlated with the regressors and the null hypothesis is that they are not (Greene 2012). The test's null hypothesis is that the preferred model is random effects vs. the alternative fixed effects (Torres 2007). The results gave a χ^2 value of 33.61 with a p value of 0.0000 which is less than 0.05. This resulted to the rejection of null hypothesis and acceptance of the alternative hypothesis. This implied that the most appropriate model for the analysis is the fixed effects regression model.

Time Fixed Effects

To determine if time fixed effects are needed when running a fixed effect model, a joint test is carried out to determine if the dummies for all years are equal to 0, if they are, then no time fixed effects are needed (Torres 2007). The results for time fixed effects gave an F value of 3.01 with a p value of 0.0000 which is less that 0.05 indicating that there are no significant time affects and therefore no need to introduce dummy variables.

Heteroskedasticity

An important assumption is that the residuals have a constant variance or are homoskedastic across time and individuals. When heteroskedasticity is present the standard errors of the estimates are biased. The presence of heteroskedasticity was tested using modified Wald test. For modified Wald test the null hypothesis is that there exists homoskedasticity (or constant variance) (Drukker 2003). The test results gave a χ^2 value of 2.3e+05with a p value less than 0.05 (p=0.0000). This resulted to rejection of the null hypothesis and acceptance of the alternative hypothesis. This leads to the conclusion that there exists heteroskedasticity.

Serial correlation

According to Gujarati (2012), serial correlation may be defined as correlation between members of series of observations ordered in time or space. Drukker (2003) argues that, because serial correlation in linear panel-data models biases the standard errors and causes the results to be less efficient, researchers need to identify serial correlation in the idiosyncratic error term in a panel-data model. The study used the Wooldridge Drukker test to test for presence of serial correlation. In this test the null hypothesis that there is no serial correlation. The result gave an F value of 2.945 with a p value of more than 0.05 (p=0.0892). This resulted to acceptance of the null hypothesis indicating that there existed no serial correlation.

Diagnostic results showed that the appropriate model for the study was fixed effect model without dummies. However, there existed heteroscedasticity but no serial correlation. When heteroscedasticity is present, the standard errors of the estimates are biased. The remedy is to compute robust standard errors correcting for the possible presence of heteroscedasticity (Hoechle 2007; Antonie et al. 2010). The study therefore used White heteroscedasticity consistent standard errors.

Descriptive statistics for the study variables

The descriptive statistic for the study variables are presented in table 3. The bias corrected technical efficiency had a mean of 0.350 with an overall standard deviation of 0.192. The standard deviation between the DTSs is higher (0.141) as compared to within the same DTSs over the years (0.131). This depicts that efficiency varies more from one DTS to the next DTS rather from year to year for each DTS.

Profitability as measured by return on assets (ROA) had an average of 0.022 with overall standard deviations of 0.024. The minimum ROA was -0.116 indicating those some DTSs reported net loss over the period 2011-2014. The cross sectional variations were found to be higher (0.024) than temporal variation within the same DTS (0.003). This indicates that the earnings were relatively stable for each DTS over the period of the study.

Diversification as measured by the ratio of non interest income to total assets had an average of 0.032. The minimum recorded value was zero implying than some DTSs had no noninterest income. This indicates that the extent of income diversification is still limited in some DTSs. It can also be seen that the variations between the DTSs (standard deviation=0.002) is significantly lower compared with variations within the same DTS over the years (standard deviation=0.037). This depicts the concerted efforts by DTSs to diversify over the years.

Asset quality as measured by the ratio of nonperforming loans to gross loans gave a mean of 0.038 with an overall standard deviation of 0.076. This indicates that only 3.8% of all loans granted by DTSs are likely to default. The result mirror those of the regulator who reported an average 0.053 and 0.0472 in the year 2013 and 2014 respectively (SASRA 2014). Size as measured by logarithm of total asset had an average of 8.880 with overall standard deviations of 0.586. The smallest DTS had a log of total asset of 7.729 whereas the biggest had 10.456 depicting a significant disparity in the size of the licensed DTSs.

Table 3: Descriptive statistics for study variables

Variable		Mean	Std. Dev.	Min	Max
Bias Corr. T. Eff.	overall	0.350	0.192	-0.016	1.082
	between		0.050	0.306	0.403
	within		0.187	0.028	1.126
Profitability	overall	0.022	0.024	-0.116	0.151
	between		0.003	0.019	0.024
	within		0.024	-0.113	0.154
Diversification	overall	0.032	0.037	0.000	0.295
	between		0.002	0.030	0.034
	within		0.037	-0.001	0.295
Asset Quality	overall	0.038	0.076	0.000	0.544
	between		0.008	0.029	0.049
	within		0.075	-0.011	0.553
Size	overall	8.880	0.586	7.729	10.456
	between		0.089	8.781	8.983
	within		0.581	7.778	10.383

Correlation Analysis of the regression variables

The study evaluated the correlation among the study variables aimed at establishing the nature and strength of the relationship between variables under examination. Table 4 shows that there exists significant correlations between bias corrected efficiency scores and all independent variables at 0.01 level of significance except profitability (p=0.434) and size (p=0.299). The correlation between efficiency scores and asset quality and diversification is negative and weak (given that they are less than 0.5). This depicts an inverse relationship which implies that an increase in one of these variables would be associated or accompanied by a decrease in efficiency scores.

On the other hand, correlation between efficiency scores and profitability and size is positive but also weak. It is important to note that all correlations are less than 0.5 depicting non existence of multicolinearity. Multicollinearity exists when independent variables are highly correlated (r>=0.9), and tends to lead to a poor regression model (Dancey & Reidy 2011).

Table 4: Correlation Analysis

	Bias Corr. TEFF	Asset quality	Diversification	Profitability	Size
Bias Corr. Teff.	1.000				
Asset quality	-0.197***	1.000			
	0.000`	-----			
Diversification	-0.270***	0.239***	1.000		
	0.000	0.000	-----		
Profitability	0.039	-0.046	-0.055	1.000	
	0.434	0.352	0.268	-----	
Size	0.051	0.011	-0.433***	0.136***	1.000
	0.299	0.830	0.000	0.006	-----

***(**)(***) significant at 10%(5%)(1%).**

4.3 Regression Results

Regression results are presented in table 5 which has model 1 and model 2. Model 1 presents the results for all the control variables while model 2 presents the results for the full model. Evidently, model 2 has a higher value of adjusted R^2 (0.430) compared to model 1 (0.422). This is an indication that the addition of a profit measure increases the predictive capability of the model. Model 1 shows that there exists a positive relationship between intermediation efficiency and size. However an inverse relationship is depicted between efficiency and income diversification and asset quality.

Model 2 is used to test a null hypothesis that: there exists no significant relationship between profitability and financial intermediation efficiency of Deposit Taking Sacco societies in Kenya. The results show that income diversification has a positive significant coefficient($\beta = 1.154, \rho = 0.003$). This result leads to rejection of the null hypothesis. The results imply that profibility enhances efficiency. An increase in return on asset by one unit results to an increase of mean efficiency by 1.154 units, holding other variables constant.

Table 5: Fixed-effects regression results

Variable	Model 1	Model 2
Constant	-2.256 (0.480)**	-2.072(0.489)**
Profitability		1.154(0.384)**
Asset quality	-0.362 (0.057)**	-0.344(0.060)**
Diversification	-0.606 (0.415)**	-0.867(0.353)*
Size	0.297 (0.056)**	0.275(0.057)**
Model statistics		
R-squared	0.570	0.577
Adjusted R-squared	0.422	0.430
S.E. of regression	0.146	0.144
Sum squared resid	6.503	6.390
Log likelihood	270.026	273.649
F-statistic	3.860	3.929
Prob(F-statistic)	0.000	0.000

*Values in Parentheses are standard errors. * indicate that the variable is significant at 5 percent; and ** indicate that the variable is significant at 1 percent.*

The findings corroborate those by Arora (2014), Maghyereh and Awartani (2014), Alrafadi, Kamaruddin and Yusuf (2014), Othman, Mansor and Kari (2014), Srairi (2010) and Sufian (2009). However Gulati (2015) found negative relationship. It reveals that most efficient DTSs were on an average characterized by higher profitability. There are a number of explanation that may be advanced on this phenomenon; First, profitable DTSs are capable of employing and retaining high caliber staff members and investing in technology which is efficiency enhancing. Secondly, they are capable of providing incentives to their staff thus motivating them to perform even better and reduce wastages. Lastly, more profitable DTSs are capable of attracting more deposits from members due to the returns earned. This enables then to provide more loans and investment opportunities to members.

The results indicate that there exists goal congruence such that as the management strives to maximize the members' wealth through increased profitability, the efficiency also improves. This supports the efficiency structure theory. The theory postulates that the relationship between market structure and performance of any firm is defined by the efficiency of the firm (Al-muharrami & Matthews 2009). The theory includes two hypotheses; the X-efficiency and scale efficiency hypotheses. The X-efficiency hypothesis argues that banks with better management practices control costs and raise profit, moving the bank closer to the best-practice, lower bound cost curve (Jeon & Miller 2005). The scale-efficiency hypothesis argues some banks achieve better scale of operation and, thus, lower costs. Lower costs lead to higher profit and faster growth for the scale-efficient banks.

Conclusion

The results indicate that there exists a positive significant relationship between profitability and intermediation efficiency. This reveals that most efficient DTSs were on an average characterized by higher profitability. Most profitable DTSs are capable of employing and retaining high caliber staff members and investing in technology which is efficiency

enhancing. They also provide incentives to staff which motivates them to perform even better and reduce wastages. More profitable DTSs are also capable of attracting more deposits from members due to the returns earned. This enables them to provide more loans and investment opportunities to members.

The direct relationship between profitability and intermediation efficiency underscores the fact that a DTS should not only be technically efficient but also profit efficient. Profitability was found to be efficiency enhancing. The results provide an interesting linkage in the goals of DTSs. They imply that the management should therefore focus at maximizing profitability of the DTS and in the process enhance efficiency. The regulator should also continually monitor the profitability of DTSs.

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