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Efficiency of Small Financial Institutions in Sri Lanka Using Data Envelopment Analysis

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Abstract
In Sri Lanka, the formal rural financial sector comprises a large number of small financial institutions (SFIs). Among SFIs, cooperative rural banks (CRBs) play an important role in meeting the rural credit needs in rural sector in Sri Lanka. CRBs have gained an increasing share of financial assets, which has been particularly helpful for satisfying the growing demand for loans and advances in poor people in the country. However, performance of SFIs in Sri Lanka is less than satisfactory and highly criticised today. Poor performance has been attributed to poor management of assets and consequently, the sustainability of these institutions is uncertain. Moreover, an attention to the efficiency of SFIs in Sri Lanka is more concern to the general public given collapses of several formal and informal SFIs. Hence, aim of this study is to evaluate the overall efficiency of SFIs in Sri Lanka by taking all CRBs operate in Sri Lanka. CRBs established in 1964 and end of 2010 there are 1,933 branches operate in all 25 districts of the country. Data envelopment analysis (DEA) is used to measure efficiency. The study found that the efficiency of CRBs in Sri Lanka have declined during the study period of 2005 to 2010. Further found that there were significant differences in the efficiency of CRBs by geographical locations and the efficient banks are closely associated with size of the Banks. The findings of this study may convince industry decision makers to establish more comprehensive policy settings for promoting particularly, CRBs activities, and overall all SFIs in Sri Lanka's rural financial sector.

Keywords: efficiency; data envelopment analysis; small financial institutions; cooperative rural banks.

INTRODUCTION

The financial service sector in Sri Lanka composed of an organised sector and an unorganised sector. The organised sector comprises diverse range financial services institutions such as commercial banks, finance companies. However, the unorganised sector mainly comprises small financial institutions such as Cooperative based banks, and the majority representing individual money lenders and pawn brokers. The organised financial service sector regulated by Central Bank of Sri Lanka (CBSL) comprises licensed commercial banks, licensed specialised banks, registered finance companies and specialized leasing companies. Licensed commercial banks have been permitted to provide all banking services. Hence, they play a central role within the financial services sector. They have the capacity to provide liquidity, and also are responsible for payment services, thereby facilitating all entities to carry out their financial transactions. In 2010, there were twenty two commercial banks, comprising two state owned institutions, nine privately owned institutions and eleven foreign banks, operating with 1,933 branches throughout the country (CBSL 2010).

In addition, the emergence of small financial institutions has also been recognised for the provision of banking services in Sri Lanka. These specialised institutions provide only certain financial services, such as insurance services, stock brokering, and microfinance services to customers. As small financial institutions, the member base cooperative rural banks (CRBs) have an extensive network throughout the country. At the end of 2010, multipurpose cooperative societies (MPCS) operate 235 CRBs with 1,933 branches (CBSL 2010) and approximately 8500 thrift and credit cooperative societies (TCCs-Sanasa) contribute, particularly to the rural financial service sector in the country. CRBs have been permitted to take deposits from the members and provide loans and advances under the *Cooperative Societies Act No. 5 of 19721*. In addition, Samurdhi banking societies, which operate under Samurdhi Authority2 of Sri Lanka, focus on financial services in rural financial sector. Although all of these small financial institutions are not regulated or supervised by the CBSL, they play a vital role for the development of small businesses and microcredit demand in particular rural parts of the country. Table 2.1 presents types of small financial institutions which provide finance activities in Sri Lanka end of 2009.

1 The first cooperative law in Sri Lanka was enacted in 1911. After several amendments, the *Cooperative Societies Act no.5 of 1972* remains the principal law at present.
2 Established under the *Samurdhi Authority Act No 30 of 1995*

Table 1 Small finance institutions at the end of 2009

Type of Institutions	No of outlets
Regional Development Banks	215
Sanasa Development Bank	36
Samurdhi Bank Societies	1,038
Co-operative Rural Banks	1,805
Sanasa/Thrift and Credit Co-Operative	3,794
Other MFIs (NGOs/LLCs/companies limited by guarantee)	2,500
Total	**9,388**

Source: Fernando (2009)

According to the Table 1 reveals that despite the importance of commercial banks, organisations based on a cooperative model remained the dominant as microfinance providers. Moreover, CRBs and Sanasa/Thrift and Credit Co-Operative compete with other institutions in savings markets as well as lending markets.

Though the purposes of small finance institutions (SFIs) in Sri Lanka are distinct, the soundness of every organisation is important as this contributes towards maintaining confidence in the system. Hence, providing efficient microfinance services can be a critical element of an effective poverty reduction strategy and can also contribute to the development of the overall financial system through integration of financial markets (ADB 2000). However, among the large number of SFIs there are a number of CRBs, and a few NGOs, who are only on the edge of becoming operationally self-sufficient and are beginning to seek commercial refinancing (Gant, Silva et al. 2002). Given this background, the microfinance sector in Sri Lanka needs structural changes for diversification of its activities to enhance self-sufficiency and provide access for rural people (Charitonenko and De Silva 2002). Hence, a comprehensive study investigating the efficiency of SFIs is important for the development of an efficient rural financial sector in Sri Lanka. Due to collapse of several financial institutions in Sri Lanka Pramuka Bank, Gloden Key Credit Card Company and Daduwam Mudalali, this research is timely to assist stakeholders of rural finance in elevating their level of confidence in the system.

RESEARCH PROBLEM

Based on the above facts, this study seeks to address the following research questions.

- Do the SFIs in Sri Lanka operate efficiently in providing microfinance activities in Sri Lanka?
- Taking into account institution size, does the size of the banks affect the efficiency?
- Taking into account institution location, does the location of the banks affect the efficiency?

OBJECTIVES OF THE STUDY

The main objective of this research is to examine the overall efficiency of small financial institutions (SFIs) in Sri Lanka by taking all CRBs operate in Sri Lanka. A comparative analysis is undertaken to identify the relative levels of the efficiency of CRBs in Sri Lanka with controls for size and geographic areas of operations. The next section reviews the literature related to efficiency in financial institutions and relate this literature to develop methodology and the measurement of efficiency of SFIs.

Measurement of Efficiency

In general, efficiency can be measured on a 'partial' factor or 'total' factor basis. Partial factor refers to the change in output owing to the change in the quantity of one input, whereas total factor refers to the change in output owing to changes in the quantity of more than one input. Accordingly, the measurement of partial factor efficiency considers only one factor and ignores the impact of changes in all other factors (Jayamaha and Mula 2011).

The DEA model for constructing a production frontier, and for the measurement of efficiency relative to the constructed formula, is an increasingly popular tool used in the nonparametric approach. Generally, DEA evaluates the efficiency of a given firm, in a given industry, compared to the best performing firms in that industry by considering many inputs and outputs. Thus, it is a relative measurement. In efficiency analysis, most researchers generally use DEA to measure the efficiency in public sector organisations, non-profit making organisations and private sector organisations3. Efficiency indexes for each firm are determined on the basis of the inputs and outputs of each firm. Such an index is called a DEA score. From these DEA scores, efficiency can be measured for a whole organisation or a unit within the organisation. The evaluation unit is also referred to as a decision-making unit (DMU). For example, one bank branch of the banking industry or a section, such as loan section, in a bank branch can be considered as a DMU.

In the production process, each DMU has a varying level of inputs and a varying level of outputs. DEA constructs a smooth curve based on the available data. The distribution of sample points is observed and a line is constructed enveloping them, hence the term "Data Envelopment Analysis (DEA)". From this line, DEA shows which producers are more efficient and finds the inefficiencies of other producers. Hence, Fried, Lovell and Schmidt (2002) suggested that DEA is an appropriate method of measuring the relative efficiency of multiple decision-making units

3 DEA is a linear programming methodology developed by Charnes, Cooper and Rhods in 1978. It was originally applied to public sector and non-profit making organisations.

by enveloping observed input-output elements as tightly as possible. Further, it is useful to estimate relative efficiency for discussion of the relative importance of inputs and to observe the marginal contribution of each input.

Many efficiency studies relate to banks and financial institutions and the DEA method has been used in different countries in different contexts. Studies by Taylor et al. (1997) of Mexican banks, Brockett et al. (1997) of American banks, Schaffnit, Rosen and Paradi (1997) of large Canadian banks, Soteriou and Zenios (1999) of Cyprus Commercial banks, Kao and Liu, (2004) of Taiwanese Commercial banks, Portela and Thanassoulis (2007) of Portuguese banks and Jayamaha and Mula (2011) of cooperative rural banks in Sri Lanka are a few of the efficiency studies in the banking sector.

Sample and Data of the Study

As discussed previously Co-operative rural banks (CRBs) remained the dominant microfinance provider in Sri Lanka in terms of micro credits and number of branches. Hence, this study considered all CRBs operate in Sri Lanka as representatives of SFIs. There are 235 including 1,933 branches of CRBs operating in Sri Lanka in all 25 districts at the time this study was conducted. Secondary data are used to analyse the efficiency of CRBs. Data are obtained from the annual financial statements and annual reports of the Central Bank of Sri Lanka for the six years from 2005 to 2010. Other relevant data are obtained from various internal reports and other official documents of CRBs.

DATA ANALYSIS

Inputs and Outputs

Efficiency scores are estimated using 'DEA-Solver software'. 125 observations for CRBs are available in each year. Thus a total of 750 observations were used for DEA efficiency analysis in this study. Deposits, No of deposit accounts, and no of branches have been identified as inputs and Loans and advances and no of loans and advances accounts have been identified as outputs from prior studies suitable of this study. The following section present and discuss descriptive statistics for all input and output variables.

Table 2: Descriptive statistics of inputs and outputs in DEA models

Input/ output	No of branches						Deposit Accounts						Deposits						Loan and advances accounts					
	2005	2006	2007	2008	2009	2010	2005	2006	2007	2008	2009	2010	2005	2006	2007	2008	2009	2010	2005	2006	2007	2008	2009	2010
Deposit accounts	0.98	0.98	0.98	0.98	1.00	0.87																		
Deposit	0.95	0.96	0.97	0.93	0.63	0.90	0.96	0.96	0.94	0.95	0.63	0.73												
Loan accounts	0.93	0.56	0.93	0.94	0.67	0.49	0.88	0.56	0.92	0.94	0.67	0.73	0.87	0.59	0.90	0.86	0.76	0.36						
Loans	0.92	0.92	0.94	0.94	0.62	0.85	0.95	0.96	0.94	0.96	0.62	0.73	0.99	0.97	0.95	0.93	1.00	0.93	0.85	0.61	0.86	0.87	0.76	0.42

**Correlation is significant at the 0.01 level

The correlation coefficients show all variables have positive and significant relationship with each other. In regard to the estimated coefficients all output variables (loans accounts, and loans and advances accounts) are positively significant correlated with deposits, deposits accounts and number of branches. In particular, the association has a very high correlation of over 0.90 in many occasions. These statistically significant and positive correlations among the variables provide further support for the appropriateness of the selected variables in the DEA models in this research. Overall, the correlation results show that change in one variable can be expected to impact the overall efficiency of the CRBs. The reminder of this section discusses the efficiency of CRBs based on estimated DEA scores.

Efficiency Scores - 2005 to 2010

The estimated efficiency scores for each DMU4 and the estimated mean efficiency scores in each year for the Six-year window (2005 to 2010) are presented in Appendix One. TE represents technical efficiency in the Charnes, Cooper, and Rhodes (CCR) model [Constant returns to scale (CRS) specification]; PTE represents pure-technical efficiency in the Banker, Charnes, and Cooper (BCC) model [Variable returns to scale (VRS) specification]; and SE represents scale efficiency with VRS. The summary of estimated results for efficiency is presented in Table 3.

4 One DMU= All CRBs operate in a district.

Table 3: Distribution of Respondents Used of Procurement Method/System

Year	Description	Number of DMUs			Descriptive Statistics			
		evaluated	efficient	inefficient	Mean	Max	Min	SD
2005	TE	25	**6**	19	0.736	1.000	0.085	0.307
	PTE	25	12	13	0.867	1.000	0.143	0.220
	SE	25	6	19	0.843	1.000	0.085	0.252
2006	TE	25	**5**	20	0.629	1.000	0.000	0.371
	PTE	25	9	16	0.807	1.000	0.163	0.253
	SE	25	5	20	0.798	1.000	0.000	0.361
2007	TE	25	**11**	14	0.880	1.000	0.592	0.128
	PTE	25	19	6	0.952	1.000	0.614	0.100
	SE	25	11	14	0.926	1.000	0.647	0.100
2008	TE	25	**9**	16	0.863	1.000	0.618	0.128
	PTE	25	18	7	0.949	1.000	0.702	0.101
	SE	25	9	16	0.909	1.000	0.733	0.091
2009	TE	25	**4**	22	0.494	1.000	0.006	0.376
	PTE	25	6	20	0.733	1.000	0.313	0.227
	SE	25	4	22	0.631	1.000	0.014	0.404
2010	TE	22	**7**	15	0.572	1.000	0.000	0.389
	PTE	22	13	9	0.685	1.000	0.000	0.387
	SE	22	7	15	0.746	1.000	0.000	0.374

TE = Technical efficiency. PTE = Pure technical efficiency. SE = Scale efficiency.

The TE scores in Table 3 show six DMUs (24%) in 2005, five (20%) in 2006 and eleven (44%) in 2007 are efficient as indicated by efficiency scores which equal to 1.00. However, efficient DMUs declined to nine (36%) in 2008, four (16%) in 2009 and in 2010 only seven (28%) efficient DMUs operate in Sri Lanka. According to the PTE scores show 12 (48%) DMUs are efficient in 2005, 9 (36%) in 2006 and 19 (76%) in 2007. Again, PTE scores show only 13 (52%) efficient DMUs operate in Sri Lanka in 2010. The number of efficient DMUs on SE is also consistent with the TE for 2005 to 2010. Figure 1 illustrates the mean efficiency scores (TE, PTE, and SE) during the period 2005 to 2010.

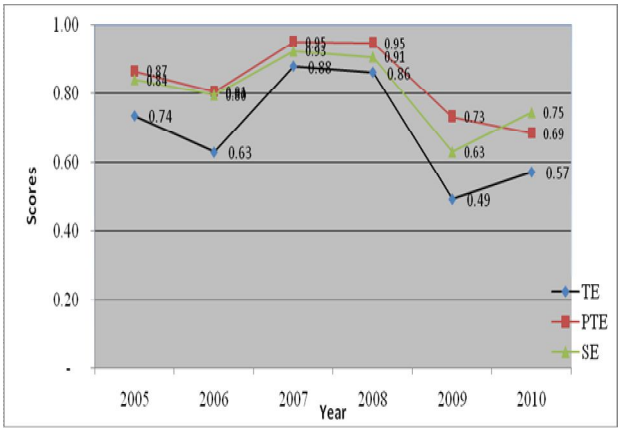

Figure 1: Efficiency scores - 2005 to 2010

TE = Technical efficiency PTE = Pure technical efficiency. SE = Scale efficiency.

As far as mean scores are concern, there is an upward trend in all CRBs in Sri Lanka average TE from 2005 to 2008 (74.0% in 2005, and 86.0% in 2008). A similar trend exists for PTE (87% in 2005, and 95% in 2005) and SE. However, as shown in Figure 1 all efficiency average scores TE, PTE, and SE in 2010 have been dropped to low average scores compare to the scores in 2005.The average efficiency scores of the least efficient DMUs in the sample are also continuously declining over the study period. This is evident in the minimum efficiency scores reported in the Table 3. The minimum score for TE 0.08, PTE 0.14 and 0.08 in 2005 fell to 0.00 in 2010. These results suggest that CRBs which reported minimum TE scores do not use their inputs efficiently comparing other CRBs and they could have produced the same outputs while reducing their inputs.

Overall Efficiency

The efficiency scores5 in analysis in Table 3 shows only 24% of CRBs (six districts out of twenty five) could be classified as efficient at the beginning of the sample period of 2005. However, efficient number were dropped down to 20% (five districts) in 2006 and slight increased to 44% (numbering eleven) in 2007 as indicated by efficiency scores which equal to 1.00. However, efficient number again declined to 36% (nine districts) in 2008, 16% (four districts) in 2009 and in 2010 only (28%) seven districts operate efficient CRBs in Sri Lanka. Overall, 72% of the CRBs (numbering CRBs operate in 15 districts) operate in Sri Lanka does not activate efficiently in 2010.

In terms of average efficiency scores also proves the same that, the efficiency scores were also decreased (TE scores 0.74 to 0.57) over the study period. Overall, it is clear that there is no substantive improvement in efficiency in this input output process. This negative trend in efficiency over the

5 Based on TE scores

period suggests that on the whole, CRBs have become less efficient.

Efficiency Analysis by Size

Five metrics are used to measure the size of sample CRBs: number of branches, number of deposit accounts, deposits, loans and advances accounts, and loans and advances. A three tier size classification system is defined in Table 4. The percentage of the sample for the small, medium and large categories for each size metric are also shown.

Table 4: Size metric of the sample

Size	Large	Medium	Small	Scale
Branches	44%	28%	28%	Large = More than 75 Medium = 25-74 Small = Below 25
Deposit accounts	44%	24%	32%	Large = Over 300 thousand Medium = Between 100 thousand to 300 thousand Small = Below 100 thousand
Deposits	20%	32%	48%	Large = More than SLR 3 million Medium = 1 million to 3 million Small = Below 1 million
Loan accounts	40%	24%	36%	Large = More than 75000 Medium = 25000-75000 Small = Below 25000
Loans	20%	20%	60%	Large = Over SLR 2.7 million Medium = Between SLR .7 million to SLR 2.7 million Small = Below SLR .7 million
Average	**34%**	**26%**	**41%**	

As shown in Table 4 specific size categories have been determined at the researcher's discretion. Broadly speaking, 34% of the sample is represented by large DMUs while medium and small DMUs represent 26% and 41% respectively (based on an average of all measurements).

In relation to the size category of branches, DMUs has branch numbers ranging from four to 234. Based on the number of operating branches, the majority (44%) of the sample are large scale. 28% of the sample Medium scale while the remaining 28% are small scale DMUs. There is also a noticeable proportion (44%) of large scale DMUs (more than 300,000 deposit account holders), while small scale (32% of the sample) have deposit accounts holders ranging from 100,000 to 300,000. In terms of Loan accounts 40% of the DMUs have more than 75,000 loan accounts considered as large scale, 36% have below 25,000 loan accounts (small scale). Deposits over SLR 3 million are reported by 20% of the sample. Loan balances over SLR 2.7 million are also reported by 20% of the sample. The majority of the sample (60%) has below SLR .7 million loan balances considered as small scale DMUs.

Efficiency scores also are analysed for the size categories in all metrics. The mean DEA scores for 2005 to 2010 for each DMU are considered for this analysis. Figures 2, 3 and 4 present efficiency (TE.PTE and SE) by size in terms of all metrics.

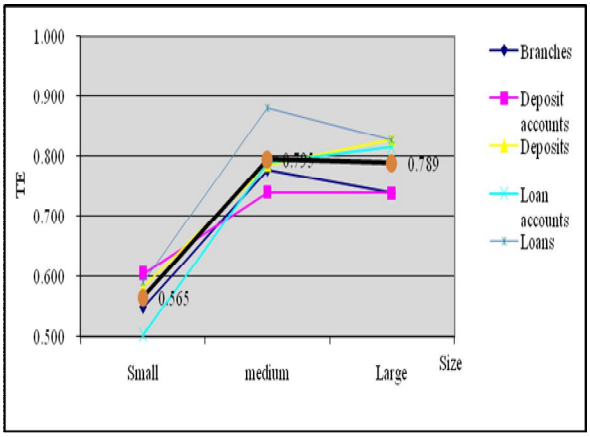

Figure 2: TE and size

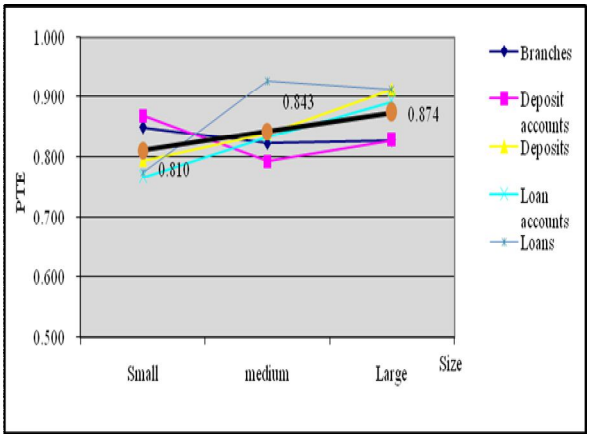

Figure 3: PTE and size

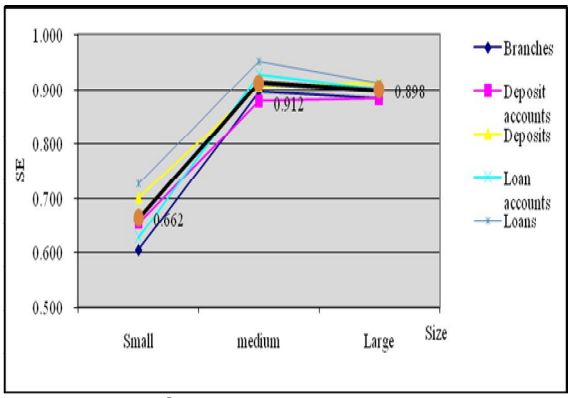

Figure 4: SE and size

The TE efficiency score of small categories in all metrics was 56%, the PTE score was 81% and the SE score was 66% during the period 2005 to 2010. Medium scale DMUs reported scores of: TE 70%, PTE 84% and SE 91%. Large scale DMUs reported scores of: TE 79%, PTE 87% and SE 90%. The estimated overall means of TE, PTE and SE scores were higher for larger DMUs compared to small size DMUs. Further, Kruskal-Wallis statistics were used to evaluate whether there is a substantial differences in efficiency in size of the DMUs. Table 5 presents the mean efficiency and Kruskal-Wallis statistics by DMU's size. The Kruskal-Wallis statistics in Table 5 shows ($p > 0.05$) there are substantial differences in TE except size metric in branches and deposit accounts. However, PTE in for DMU size (except size of loan metric) there are substantial differences in DMU size.

Table 5: Kruskal-Wallis Chi-Square statistics by DMU's size

Test	Branches	TE	PTE	SE
Kruskal-Wallis Chi-Square		5.097	.017	6.169
p -value		.078	.992	.046
Test	Deposit Accounts	TE	PTE	SE
Kruskal-Wallis Chi-Square		1.985	.941	2.682
p -value		.371	.625	.262
Test	Deposits	TE	PTE	SE
Kruskal-Wallis Chi-Square		6.628	2.216	5.223
p -value		.036	.330	.073
Test	Loan accounts	TE	PTE	SE
Kruskal-Wallis Chi-Square		10.096	3.272	10.293
p -value		.006	.195	.006
Test	Loans	TE	PTE	SE
Kruskal-Wallis Chi-Square		9.157	6.241	9.310
p -value		.010	.044	.010

Further, Spearman correlation coefficients are calculated to test for associations of size and efficiency. As described previously, the number of branches, deposit accounts, deposits, loan accounts and loans were used to measure the size of the DMUs in this analysis. Spearman correlation coefficients are calculated to test for associations of size and efficiency (Table 6). The results confirm that the DMUs size metrics and efficiency [TE] have positive correlations in all size variables. Further, size category of deposits, loan accounts and loans metrics provide clear evidence that there is a significant correlation between size and the efficiency of the institutions. The evidence is consistent with previous discussions with larger DMUs being more efficient with respect to TE (Jayamaha and Mula 2011).

Table 6: Spearman correlation coefficients associations of size and efficiency

Institution-specific characteristic	**Hypothesised correlation to efficiency**	**Correlation coefficient**	**Support the hypothesis**
		TE	
Number of branches	Positive	0.304	**Yes**
Deposit accounts	Positive	0.230	**Yes**
Deposits	Positive	**.511****	**Yes**
Loan accounts	Positive	**.595****	**Yes**
Loans	Positive	**.570****	**Yes**

** Correlation is significant at the 0.01 level

Efficiency Analysis by Location

Efficiency scores are examined to see whether regional disparity affects the efficiency of the CRBs. Table 7 and Figure 6 presents the mean efficiency scores by district calculating the overall mean efficiency of each DMU in the sample period of 2005 to 2010.

As per Figure 6 only one CRB, Polonnaruwa (No. 19) maintain efficient average of TE, PTE and SE score 1.00 over the sample period. Hambantota (No. 9), Ampara (No. 14) CRBs maintain average of TE score more than .90 (.923 and .932 respectively) over the sample period. Only 3 (12%) DMUs in Sri Lanka reported more than .90 scores for efficiency. However, as stated in previous section overall TE scores of mean of the year continuously declining over the study period, the overall mean of each DMU scores suggest that 88% of the DMUs reported less than .90 TE scores.

Table 7: Mean efficiency and Kruskal-Wallis test scores by location

		Mean		
No.	**DMU**	**TE**	**PTE**	**SE**
1	Colombo	0.777	0.868	0.905
2	Gampaha	0.845	0.961	0.881
3	Kalutara	0.822	0.830	0.990
4	Kandy	0.823	0.914	0.908
5	Matale	0.850	0.889	0.935
6	Nu' Eliya	0.825	0.891	0.884
7	Galle	0.803	0.834	0.964
8	Matara	0.832	0.956	0.875
9	Hambantota	**0.923**	0.933	0.987
10	Jaffna	0.422	0.538	0.749
11	Manner	0.406	0.949	0.408
12	Vavunia	0.500	0.957	0.502
13	Batticaloa	0.519	0.683	0.744
14	Ampara	0.932	0.980	0.949
15	Trincomalee	0.751	0.821	0.897
16	Kurunegala	0.844	**1.000**	0.844
17	Puttalam	0.863	0.896	0.965
18	Anu'pura	0.779	0.836	0.927
19	Polonnaruwa	**1.000**	**1.000**	**1.000**
20	Badulla	0.569	**0.638**	0.874
21	Monaragala	0.643	0.669	0.789
22	Kegalle	0.404	0.501	0.766
23	Ratnapura	0.537	0.706	0.740
24	Mulativ	0.379	0.833	0.379
25	Kilinichchi	**0.342**	0.722	**0.353**
ALL		**0.696**	**0.832**	**0.809**

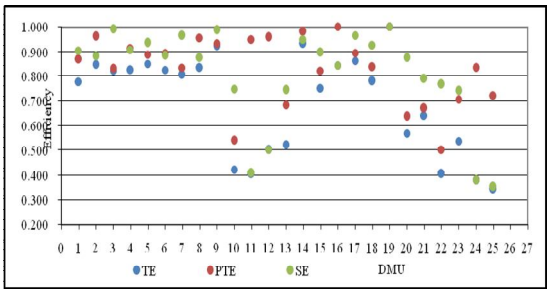

Figure 6: Efficiency by Location
TE = Technical efficiency PTE = Pure technical efficiency. SE = Scale efficiency.

Therefore, another analysis has been made to see whether any regional disparity affects the efficiency of Sri Lankan CRBs. Kruskal-Wallis test has been used to see any regional disparity affects the efficiency. Table 8 presents the Kruskal-Wallis results.

Table 8: Kruskal-Wallis Chi-Square statistics by DMU's location

Test	Location by districts	TE	PTE	SE
Kruskal-Wallis Chi-Square		17.772	11.557	17.375
p -value		.038	.239	.043

TE = Technical efficiency PTE = Pure technical efficiency. SE = Scale efficiency.

The Kruskal-Wallis scores (Table 8) *(p<0 .05)* in TE and SE indicate that, there are significant differences in the efficiency of CRBs by geographical locations.

The results suggest that a difference in the operational environment contributes to differences in CRBs' efficiencies. However, PTE, *p>.05 (*.239) indicated that there is no significant different in the efficiency of CRBs by geographical locations.

FINDINGS AND CONCLUSION

The primary objective in this study is to assess overall efficiency of CRBs in Sri Lanka by taking the all 1,933 CRBs operate in 2010. It was found that the majority of CRBs have become less efficient over the study period and did not use their inputs efficiently. However, further found that there were significant differences in the efficiency of CRBs by geographical locations. Further, the study shows that efficient banks are closely associated with size of the Banks.

This efficiency study is much important for policy makers and management, the reason that, after the year 2005 many new financial institutions entered the rural finance market in Sri Lanka and many commercial banks diversified their activities to include microfinance services (CBSL 2006). Hence, it is important to assess that pioneers of the microfinance activities in Sri Lanka, CRBs, operate their activities in different market segments especially as changing macroeconomic conditions. However, Charitonenko and De Silva (2002) stated that internal constraints, such as lack of awareness of best practices in microfinance, weak institutional capacity and a negative perception of the commercialisation decision, hamper diversification of activities of CRBs, result in decreasing membership

may have adversely affected CRBs efficiency. Finally, the findings of this study may convince industry decision makers to establish more comprehensive policy settings for promoting CRBs activities in the Sri Lanka rural financial sector and survival of the institutions.

LIMITATIONS OF THE STUDY

Analyses and findings of this study are subject to the following limitations.

This study is based on secondary data collected from annual reports which was located in MPCSs. Further, data sourced from CRBs' financial statements, while audited, may not be strictly accurate and comparable. The level of variation in disclosure across the sample is also a limitation. Hence, the sufficiency, reliability, and validity of data are subject to the above limitations. Further, this study focused on only one type of SFI, namely CRB. No attempt has been made to assess the efficiency of different types of SFIs operating in Si Lanka. Other types of SFIs such as TCCs Sanasa, Samurdi Banking Societies, and different microfinance institutions may or may not have similar issues, but this study does not attempt to provide evidence for other SFIs. In general, subject to the data limitations discussed above, the analysis of efficiency in this study is based on CRBs and difficult to generalise for the whole small financial instituions so the results obtained must be treated with caution

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APPENDIX I: Efficiency Scores

		2005			2006			2007			2008			2009			2010			Mean		
No.	DMU	TE	PTE	SE	TE	PTE	SE	TE	PTE	SE	TE	PTE	SE	TE	PTE	SE	TE	PTE	SE	**TE**	**PTE**	**SE**
1	Colombo	0.998	1.000	0.998	0.879	0.943	0.932	0.756	1.000	0.756	0.810	1.000	0.810	0.733	0.770	0.951	0.486	0.495	0.981	**0.777**	**0.868**	**0.905**
2	Gampaha	0.928	1.000	0.928	0.812	0.889	0.913	0.771	1.000	0.771	0.733	1.000	0.733	0.829	0.880	0.942	1.000	1.000	1.000	**0.845**	**0.961**	**0.881**
3	Kalutara	0.884	0.885	0.999	0.830	0.833	0.996	1.000	1.000	1.000	1.000	1.000	1.000	0.927	0.967	0.958	0.289	0.293	0.988	**0.822**	**0.830**	**0.990**
4	Kandy	0.875	1.000	0.875	1.000	1.000	1.000	0.880	1.000	0.880	0.788	0.981	0.803	0.502	0.505	0.993	0.895	1.000	0.895	**0.823**	**0.914**	**0.908**
5	Matale	1.000	1.000	1.000	0.980	0.997	0.982	1.000	1.000	1.000	1.000	1.000	1.000	0.378	0.557	0.680	0.740	0.778	0.951	**0.850**	**0.889**	**0.935**
6	Nu' Eliya	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.187	0.343	0.544	0.761	1.000	0.761	**0.825**	**0.891**	**0.884**
7	Galle	0.959	0.998	0.961	1.000	1.000	1.000	0.757	0.812	0.933	0.726	0.801	0.907	0.664	0.674	0.987	0.714	0.718	0.995	**0.803**	**0.834**	**0.964**
8	Matara	0.876	0.968	0.906	0.846	0.887	0.954	0.847	1.000	0.847	0.810	1.000	0.810	0.839	0.878	0.955	0.776	1.000	0.776	**0.832**	**0.956**	**0.875**
9	Hambantota	1.000	1.000	1.000	0.921	0.949	0.970	1.000	1.000	1.000	0.959	0.964	0.995	0.658	0.687	0.958	1.000	1.000	1.000	**0.923**	**0.933**	**0.987**
10	Jaffna	0.122	0.143	0.853	0.204	0.218	0.935	1.000	1.000	1.000	1.000	1.000	1.000	0.029	0.600	0.048	0.175	0.267	0.656	**0.422**	**0.538**	**0.749**
11	Manner	0.341	1.000	0.341	0.000	1.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000	0.019	0.697	0.027	0.077	1.000	0.077	**0.406**	**0.949**	**0.408**
12	Vavunia	1.000	1.000	1.000	0.000	1.000	0.000	1.000	1.000	1.000	0.857	1.000	0.857	0.036	0.745	0.048	0.109	1.000	0.109	**0.500**	**0.957**	**0.502**
13	Batticaloa	0.429	0.528	0.813	0.509	0.659	0.771	0.771	0.778	0.991	0.717	0.750	0.956	0.076	0.624	0.121	0.614	0.760	0.808	**0.519**	**0.683**	**0.744**
14	Ampara	0.733	0.878	0.836	0.860	1.000	0.860	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	**0.932**	**0.980**	**0.949**
15	Trincomalee	0.460	0.515	0.894	0.449	0.582	0.771	1.000	1.000	1.000	1.000	1.000	1.000	0.596	0.832	0.716	1.000	1.000	1.000	**0.751**	**0.821**	**0.897**
16	Kurunegala	0.816	1.000	0.816	0.929	1.000	0.929	0.647	1.000	0.647	0.774	1.000	0.774	1.000	1.000	1.000	0.897	1.000	0.897	**0.844**	**1.000**	**0.844**
17	Puttalam	0.915	0.916	0.999	0.705	0.708	0.996	0.799	0.874	0.914	0.889	1.000	0.889	0.869	0.876	0.993	1.000	1.000	1.000	**0.863**	**0.896**	**0.965**
18	Anu'pura	0.563	0.664	0.848	0.588	0.591	0.996	0.834	0.936	0.891	0.686	0.827	0.829	1.000	1.000	1.000	1.000	1.000	1.000	**0.779**	**0.836**	**0.927**
19	Polonnaruwa	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	**1.000**	**1.000**	**1.000**
20	Badulla	0.892	1.000	0.892	0.153	0.163	0.938	0.948	1.000	0.948	0.889	1.000	0.889	0.183	0.313	0.585	0.349	0.352	0.994	**0.569**	**0.638**	**0.874**
21	Monaragala	1.000	1.000	1.000	1.000	1.000	1.000	0.766	0.793	0.966	0.674	0.705	0.957	0.418	0.516	0.809	0.000	0.000	0.000	**0.643**	**0.669**	**0.789**
22	Kegalle	0.590	0.627	0.941	0.433	0.434	0.998	0.592	0.614	0.965	0.618	0.702	0.880	0.006	0.399	0.014	0.186	0.233	0.797	**0.404**	**0.501**	**0.766**
23	Ratnapura	0.802	0.894	0.898	0.639	0.642	0.995	0.761	1.000	0.761	0.775	1.000	0.775	0.022	0.469	0.046	0.223	0.231	0.964	**0.537**	**0.706**	**0.740**
24	Mulativ	0.085	1.000	0.085	0.000	1.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000	0.187	1.000	0.187	0.000	0.000	0.000	**0.379**	**0.833**	**0.379**
25	Kilinichchi	0.122	0.667	0.183	0.000	0.667	0.000	0.876	1.000	0.876	0.857	1.000	0.857	0.201	1.000	0.201	0.000	0.000	0.000	**0.342**	**0.722**	**0.353**
	Mean	**0.736**	**0.867**	**0.843**	**0.629**	**0.807**	**0.798**	**0.880**	**0.952**	**0.926**	**0.863**	**0.949**	**0.909**	**0.494**	**0.733**	**0.631**	**0.572**	**0.685**	**0.746**	**0.696**	**0.832**	**0.809**