

Cooperative Rural Banks: Can They Survive?

Evidence Using All Corporative Rural Banks in Sri Lanka

ARIYARATHNA JAYAMAHA

Department of Accountancy, University of Kelaniya, Sri Lanka

jayamaha@kln.ac.lk

Abstract

Cooperative rural banks (CRBs) play an important role in providing the rural credit needs offering loans, pawning facilities and savings in rural sector in Sri Lanka. Last few decades even though large number of financial institutions has been increasing 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, in general, efficiency of CRBs in Sri Lanka highly criticized today on their performance in poor management of their assets and consequently, the sustainability of these institutions is uncertain. Furthermore, the numbers of failures in formal and informal small financial institutions have been occurred over the past few decades in Sri Lanka, the efficiency of CRBs in Sri Lanka is more concern.

This study evaluates the efficiency of CRBs in Sri Lanka by using all CRBs operate in Sri Lanka, 1,193 branches, including North and East provinces. A comparative analysis of the efficiency of CRBs is undertaken by districts by using a Total Factor Productivity measurement, Data envelopment analysis (DEA).

It is found that the CRBs in Sri Lanka do not operate efficiently during the period of 2005 to 2010 in providing microcredit activities. This indicates that the survival of CRBs in Sri Lanka in their current form is uncertain in the current financial system. However, the findings suggest that in terms of geographical districts operating, there are significant differences in the efficiency of CRBs. Therefore, the findings of this study contribute to understanding the underlying problems for efficiency in particular all CRBs in Sri Lanka.

Key words: Efficiency, Sustainability, Data Envelopment Analysis, Cooperative Rural Banks.

Introduction

Under the *Cooperative Societies Act*¹ Cooperative Rural Bank (CRB) was established in 1964 as a small bank, to provide microcredit facilities to rural communities (Gant, Silva et al., 2002). The main goal of CRBs is to cater to the specific finance needs of those in rural areas and provide stronger institutional support for rural credit. As a formal financial institutions, they have made significant contributions in terms of credit provisioning and savings mobilisation in the last fifty years (Gant, Silva et al., 2002). Specially, for people living in rural Sri Lanka, CRBs have gained an increasing share of financial assets, satisfying the growing demand for loans and advances (Charitonenko and De Silva, 2002).

However, given the collapse of several formal and informal financial institutions in Sri Lanka last ten years (Pramuka Bank, Sakvithi, Golden Key Credit Card Company, for examples) the stakeholders of CRBs, mainly rural people, and the general public justify the importance of CRBs' financial services and the assessment of their financial strength. Furthermore, increasing competition from commercial banks entering the microfinance industry will increase pressures on CRBs to achieve sustainability while remaining financially viable (Abeyaratna, 2007). Therefore, evaluating the efficiency of CRBs in Sri Lanka in this context is vital to build the confidence of stakeholders, the general public and the survival of the institution. Survival and success in competitive markets demand achieving the highest level of efficiency. Further, this would help to identify the areas of inefficiency of the institutions and formulate strategies to improve them.

Objectives of the Study

The main objective of this research is to examine the overall efficiency of CRBs by taking all CRBs operate in Sri Lanka in 2010. A comparative analysis is undertaken by districts to identify the relative levels of the efficiency of CRBs in Sri Lanka with controls for geographic areas of operations. Furthermore, a comparative analysis of the efficiency of CRBs has been made by using a Total Factor efficiency measurement, instead of partial factor efficiency measurements.

¹*Cooperative Societies Act no.5 of 1972*

An Overview of Cooperative Rural Banks in Sri Lanka

In the early 1960s, the establishment of CRBs under the cooperative movement was the most significant step in developing formal microfinance activities by Sri Lankan government since independence in 1948. Throughout the last fifty years CRBs grew to dominate microfinance activities in Sri Lanka by achieving significant outreach. At the end of 1964 the total number of CRBs in the country was only three and end of 2005 there were 1500 CRBs. It has been gradually increased last ten years and number of branches was 1,933 with all branches at the end of 2010 as shown in Figure 1.

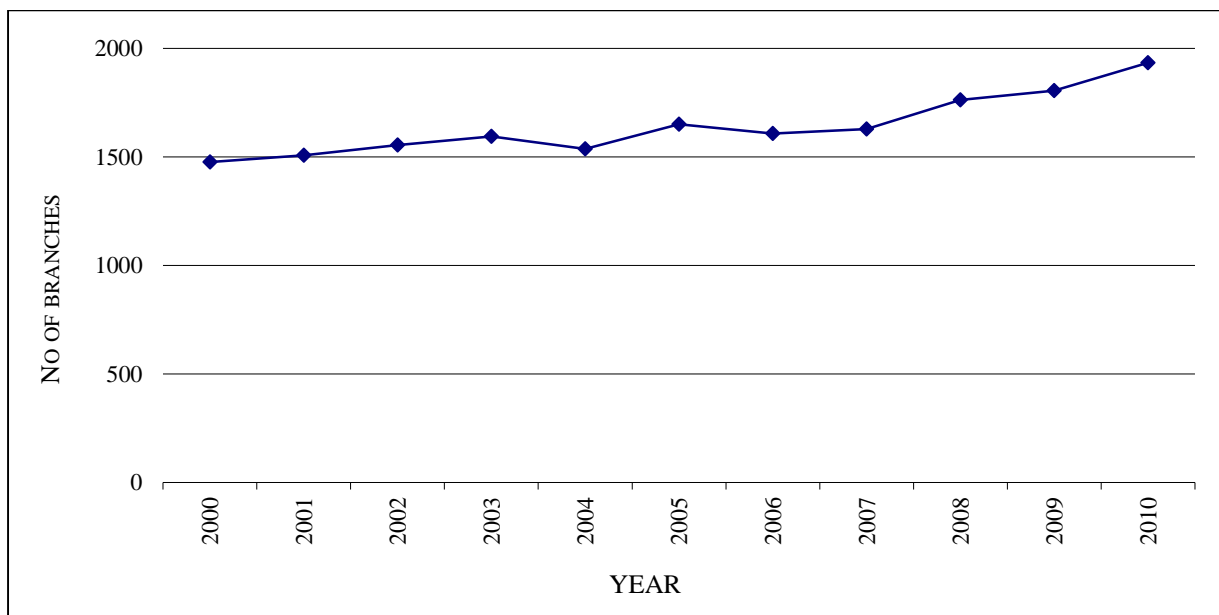


Figure 1: Number of branches operates -year 2000 to 2010

Further, Table 1 presents the geographical location of all branches of 1933 CRBs in the country by province and by district as at 31 December 2010. As shown in Table 1, CRBs branches are operate all twenty five districts in all nine provinces except Mulativu and Killinochchi districts. In terms of representativeness, the districts of Gampaha 13%, Kurunegala represents 12%, and Colombo 8%, Galle 7% and Kandy 7%. A small percentage of the sample (less than 1%) comes from the district of Manner and Vauniya.

Table 1: Geographical location of the sample

Province	District	No. of CRBs (Branches)	%
Western	Colombo	152	8%
	Gampaha	242	13%
	Kalutara	91	5%
Central	Kandy	136	7%
	Matale	83	4%
	NuwaraEliya	57	3%
Southern	Galle	131	7%
	Matara	114	6%
	Hambantota	60	3%
Northern	Jaffna	33	2%
	Manner	5	0%
	Vauniya	4	0%
	Mulativu	NA	NA
	Killinochchi	NA	NA
Eastern	Baticoloa	19	1%
	Ampara	26	1%
	Trincomalee	11	1%
North West	Kurunegala	236	12%
	Puttlama	86	4%
North Central	Anuradhapura	72	4%
	Polonnaruwa	41	2%
Uva	Badulla/ Monoragala	132	7%

Sabaragamuwa	Rathnapura	92	5%
	Kegalle	110	6%
Total		1,933	100%

Source: Operational environment of CRBs from 2005 to 2010

In the year 2005, there were about 6.4 million savings accounts being maintained by CRBs and it has been increased to 9.6 million at the end of 2010. Concurrently, 1.28 million members' loan accounts at the end of 2005 were gradually increased to 2.15 million at the end of 2010. Figure 2 exhibits the deposit accounts and the loan and advances accounts of the CRBs from year 2005 to 2010.

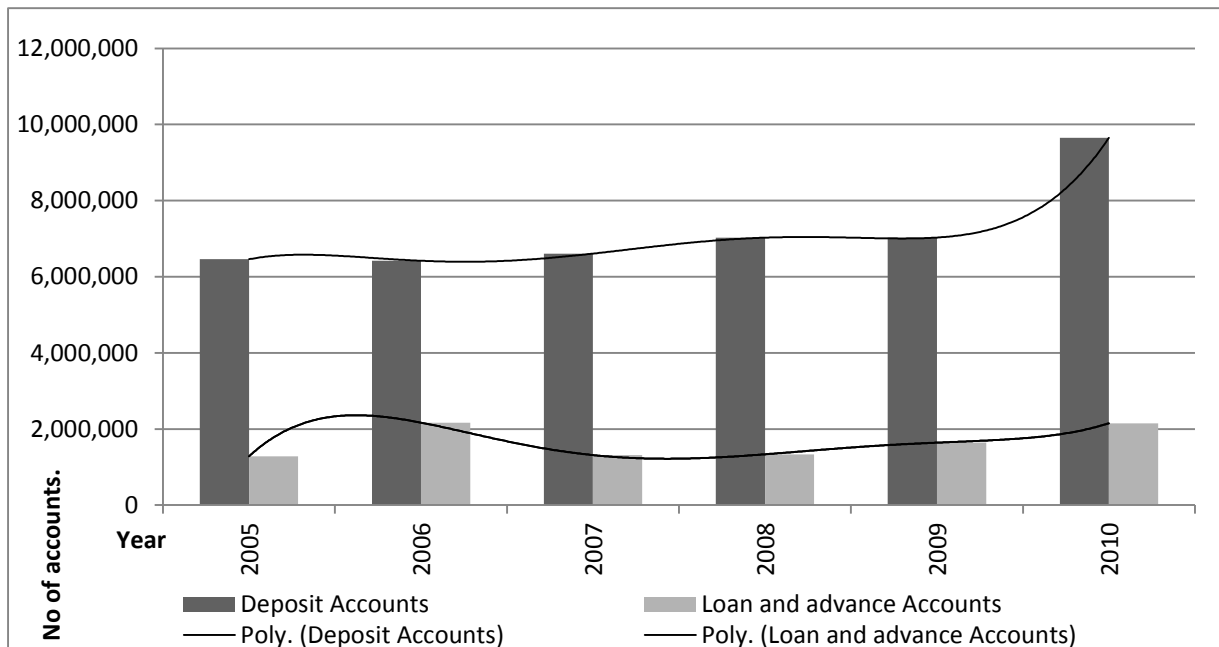


Figure 2: Deposits and loan and advances accounts from year 2005 to 2010

Despite the rapid expansion of all financial services in Sri Lanka during the last decades, CRBs retain their dominant position in the microcredit sector. Consequently, deposits and loan and advances increased gradually during the period of 2005 to 2010. Figure 3 exhibits the total deposits and total loan and advances in CRBs over the period from 2005 to 2010.

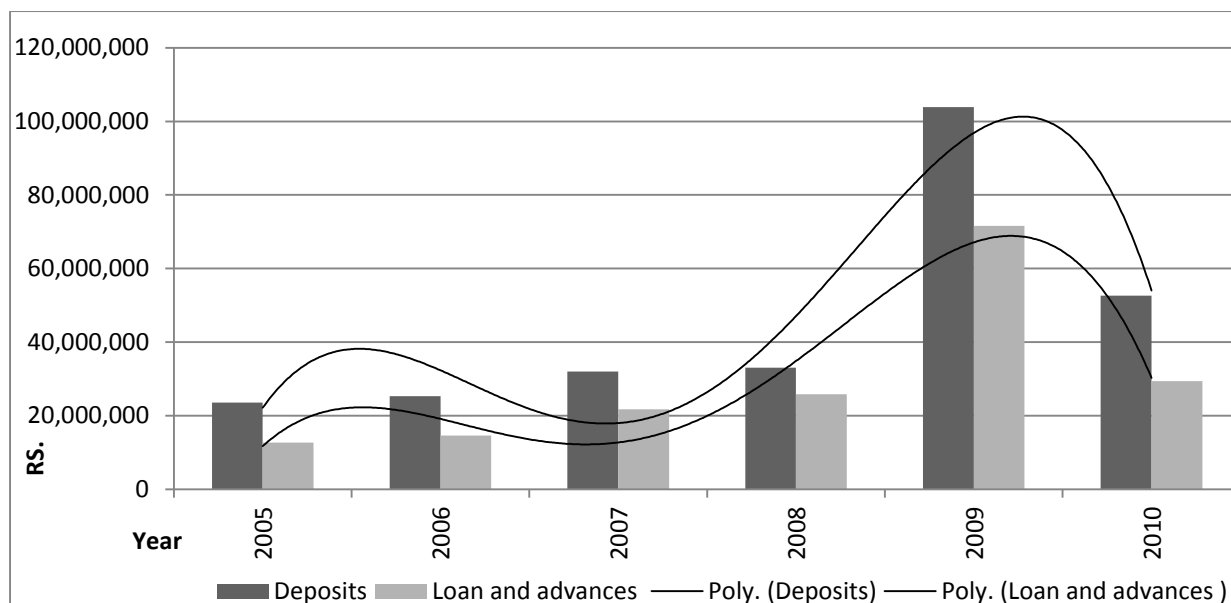


Figure 3: Deposits and loan and advances from year 2005 to 2010

According to the Figure 3 Total deposits in the year 2005 were SLR. 23.56 million, increased to SLR 103.8 million in 2009. However, it has been considerable dropped to SLR. 52.6 to 2010. However, total loans and advances were SLR 12.63 million in 2005, gradually increased to SLR 29.39 million in 2010. Though there was a dropped in 2010, it is clear that CRBs maintained an increasing share of deposits and loan and advances during the period of 2005 to 2009. This has been particularly helpful in satisfying the growing demand for loans and pawning advances for people living in rural areas of Sri Lanka.

Though the number of branches, deposits accounts, loan and advances accounts, deposits and loan and advances have been increased during the last few years, in general, efficiency of CRBs in Sri Lanka are highly criticized today on their performance in poor management of their assets. Consequently, the sustainability of these institutions is uncertain. Furthermore, the numbers of failures in formal and informal small financial institutions have been occurred over the past few decades in Sri Lanka, the efficiency of CRBs in Sri Lanka is more concern in general public. Therefore, it is vital to evaluate comparative study of efficiency among all CRBs in Sri Lanka during this period.

Efficiency Measurements- DEA analysis

Efficiency can be measured on a ‘partial’ factor or ‘total’ factor basis (Jayamaha and Mula, 2011). Partial factor productivity (PFP) refers to the change in output owing to the change in

the quantity of one input, whereas total factor productivity (TFP) refers to the change in output owing to changes in the quantity of more than one input. Accordingly, the measurement of partial factor productivity considers only one factor and ignores the impact of changes in all other factors. However, Coelli, Rao and Battese (1998) argued that partial measures provide a misleading indication of overall productivity and efficiency of the firm because they provide productivity and efficiency for only one section of the firm.

Data Envelopment Analysis (DEA)² 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 TFP in nonparametric approach. Generally, DEA evaluates the efficiency of a given firm, in a given industry, compared to the best performing firms in that industry. 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 organization or a unit within the organization. The evaluation unit is also referred to as a decision-making unit (DMU).

The DEA approach to evaluating productivity and efficiency is further explained in Figure 4. It presents a sample of six firms in an industry that use two inputs X and Y to produce one output. Based on each firm's usage of inputs, data are plotted in Figure 4. As a large difference in the combination of inputs for obtaining the output of these firms, exists it is very difficult to evaluate their productivity and efficiency by a single score. However, a frontier line can be drawn based the firms closest to the origin. So, a line can be drawn from firms 'E', 'A', 'C' to firm 'D'. This frontier line envelops all the data points and approximates the efficient frontier line.

² 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.

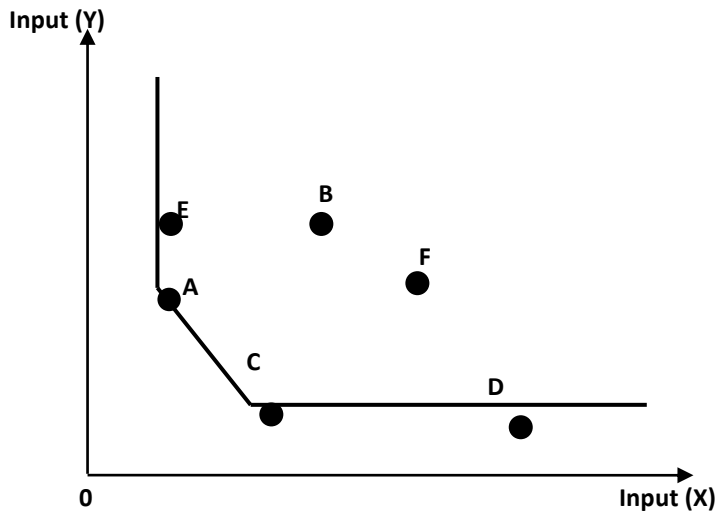


Figure 4: The efficient frontier in data envelopment analysis

Source: (Coelli, Rao et al. 1998, p.143)

It is relatively easy to implement the DEA approach in this example because firms use only two inputs and produce only one output. However, when inputs and outputs are multiple, it becomes complex and it is necessary to use mathematical formula and a computer package. The basic DEA model presents an efficiency based on the ratio which is the ratio of outputs to inputs. Table 2 presents the inputs and outputs have been used for this study. This study applies the basic Charnes, Cooper and Rhodes's (1978) (CCR) model. In this model the production frontier has constant returns to scale. DEA efficiency scores are estimated using 'DEA-Solver software'.

Table 2: Input-output specifications used

Variables	Definition	Input	Output
Deposits	Amounts collected as deposits	Input	
No of deposit accounts	Number of deposit accounts	Input	
No of branches	Number of branches operate	Input	
Loans and advances	Amount of loans and advances provided		Output
No of loans and advances accounts	Number of loans and advances accounts		Output

Efficiency of Cooperative Rural Banks in Sri Lanka

The study is based on all CRBs (1933 branches) established in Sri Lanka in 2010. The required data was obtained from CRBs for the six years 2005 to 2010. The comparison of efficiency is made between years 2005 to 2010. This study window is selected to allow newer entrants time to establish their operations. All CRB branches operate in a district have been taken as a decision making unit (DMU³) for this study. The estimated efficiency scores (technical efficiency-TE) for each DMU and the estimated mean efficiency scores in each year for the Six-year window (2005 to 2010) are presented in Table 3.

Efficiency Scores

Table 3: Efficiency scores of DMUs

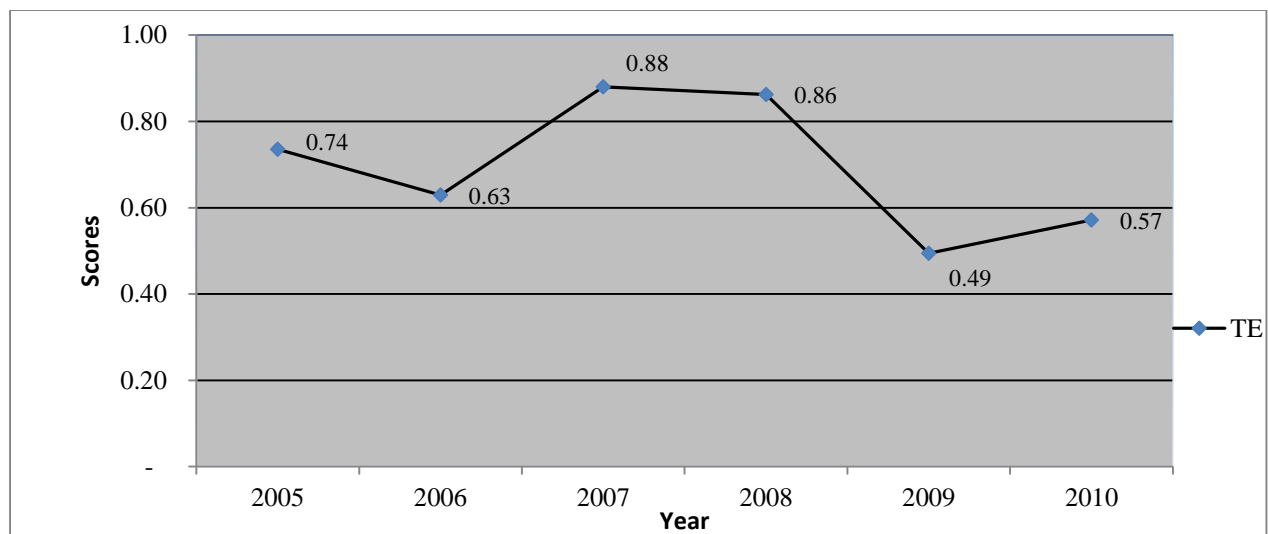
No.	DMU	2005	2006	2007	2008	2009	2010	Mean of DMU
		TE	TE	TE	TE	TE	TE	TE
1	Colombo	0.998	0.879	0.756	0.810	0.733	0.486	0.777
2	Gampaha	0.928	0.812	0.771	0.733	0.829	1.000	0.845
3	Kalutara	0.884	0.830	1.000	1.000	0.927	0.289	0.822
4	Kandy	0.875	1.000	0.880	0.788	0.502	0.895	0.823
5	Matale	1.000	0.980	1.000	1.000	0.378	0.740	0.850
6	Nu' Eliya	1.000	1.000	1.000	1.000	0.187	0.761	0.825
7	Galle	0.959	1.000	0.757	0.726	0.664	0.714	0.803
8	Matara	0.876	0.846	0.847	0.810	0.839	0.776	0.832
9	Hambantota	1.000	0.921	1.000	0.959	0.658	1.000	0.923
10	Jaffna	0.122	0.204	1.000	1.000	0.029	0.175	0.422
11	Manner	0.341	0.000	1.000	1.000	0.019	0.077	0.406
12	Vavunia	1.000	0.000	1.000	0.857	0.036	0.109	0.500

³ One DMU= All CRBs operate in a district.

13	Batticaloa	0.429	0.509	0.771	0.717	0.076	0.614	0.519
14	Ampara	0.733	0.860	1.000	1.000	1.000	1.000	0.932
15	Trincomalee	0.460	0.449	1.000	1.000	0.596	1.000	0.751
16	Kurunegala	0.816	0.929	0.647	0.774	1.000	0.897	0.844
17	Puttalam	0.915	0.705	0.799	0.889	0.869	1.000	0.863
18	Anu'pura	0.563	0.588	0.834	0.686	1.000	1.000	0.779
19	Polonnaruwa	1.000	1.000	1.000	1.000	1.000	1.000	1.000
20	Badulla	0.892	0.153	0.948	0.889	0.183	0.349	0.569
21	Monaragala	1.000	1.000	0.766	0.674	0.418	0.000	0.643
22	Kegalle	0.590	0.433	0.592	0.618	0.006	0.186	0.404
23	Ratnapura	0.802	0.639	0.761	0.775	0.022	0.223	0.537
24	Mulativ	0.085	0.000	1.000	1.000	0.187	0.000	0.379
25	Kilinichchi	0.122	0.000	0.876	0.857	0.201	0.000	0.342
	Mean of year	0.736	0.629	0.880	0.863	0.494	0.572	0.696

Considering the efficiency scores of each DMU, 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, in Mulative in 2005 fell to 0.00 in 2010. These results suggest that CRBs in these districts do not use their inputs efficiently and they could have produced the same outputs while reducing their inputs. However, Kurunegala, Gampaha, Hambantota and Kandy DMUs reported upward trend of TE scores from 2005 to 2010 revealed that comparing others they have produced the same outputs while reducing their inputs. Figure 5 presents the mean efficiency for the period of 2005 to 2010 by districts.

Overall Mean Efficiency Scores by Year 2005 to 2010



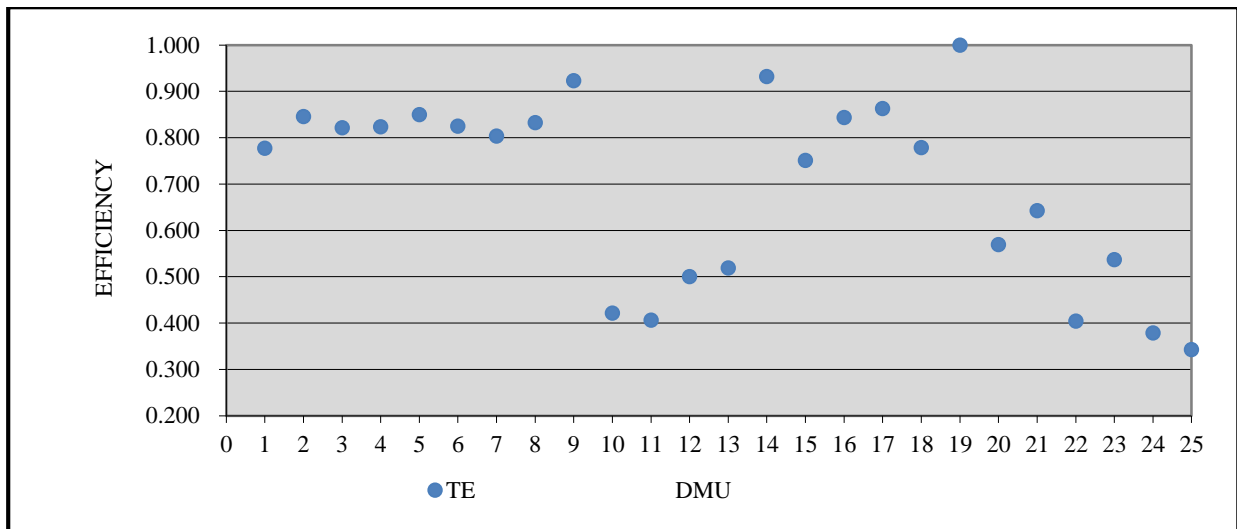
TE = Technical efficiency

Figure 5: Overall mean efficiency scores by year 2005 to 2010

Figure 6 has been drawn by taking the figures of mean of year presented in the last row of the Table 3. As far as mean scores of the year 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). However, as shown in Figure 6 all efficiency average scores of TE in 2010 have been dropped to low average scores to the scores in 2005. TE scores of mean of the year continuously declining over the study period suggest that overall efficiency of CRBs in Sri Lanka dropped for the study period.

Overall Mean Efficiency by Districts

Further analysis Figure 6 has been drawn by taking the figures of mean of DMUs presented in the last column of the Table 3. Figure 7 presents the overall mean efficiency of each DMU in the sample period of 2005 to 2010.



TE = Technical efficiency, Number 1-25 represents the name of the DMU as stated in first column of the Table 3

Figure 6: Overall mean efficiency by districts

As per Figure 7 only one CRB, Polonnaruwa (No. 19) maintain efficient average of TE 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. 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 and Table 4 presents the Kruskal-Wallis results.

Kruskal-Wallis Scores

Table 4:Kruskal-Wallis statistics results

Test	Location by districts	Technical efficiency
Kruskal-Wallis Chi-Square		17.772
<i>p</i> -value		.038

p < 0 .05 = Significant difference

The Kruskal-Wallis scores (Table 4) ($p < 0.05$) in TE 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.

Summary of Efficient CRBs - 2005 to 2010

By considering all TE scores and comparing all inputs and outputs in this study the summary of estimated results for efficiency is presented in Table 5.

Table 5: Summary of efficient CRBs - 2005 to 2010

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
2006	TE	25	5	20	0.629	1.000	0.000	0.371
2007	TE	25	11	14	0.880	1.000	0.592	0.128
2008	TE	25	9	16	0.863	1.000	0.618	0.128
2009	TE	25	4	22	0.494	1.000	0.006	0.376
2010	TE	22	7	15	0.572	1.000	0.000	0.389

TE = Technical efficiency. Efficient = 1.00, Inefficient <1.00

The TE scores in Table 5 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. Further reveal that inefficient CRBs operate in nineteen districts in 2005 (76%) and gradually increased to 20 districts (80%) in 2007 and further (22) (88%) in 2009. These results suggest that CRBs in these districts do not use their inputs efficiently comparing CRBs operate in other districts and they could have produced the same outputs while reducing their inputs.

Conclusion

The primary focus in this study is to assess overall efficiency of CRBs in Sri Lanka by taking the all 1,933 CRBs operate in 2010. The sample period of this study was 2005 to 2010. Total factor measurement, the data envelopment analysis (DEA) technique is employed instead of partial factor efficiency measurements. A comparative analysis is undertaken by districts efficiency scores from DEA analysis to identify the relative levels of the efficiency among CRBs in Sri Lanka.

Only six districts (24%) in 2005, five districts (20%) in 2006 and eleven districts (44%) in 2007 are operate efficient CRBs as indicated by efficiency scores which equal to 1.00 could be classified as a very strong efficiency DEA score. Moreover, efficiently operate districts were declined to nine (36%) in 2008, four (16%) in 2009 and in 2010 only seven (28%). By considering the overall mean efficiency by year scores also shows that a continuous decline over the study period (2005 -.074 to 2010- 0.57). This indicates that the majority of CRBs has become less efficient over the study period and did not use their inputs efficiently. This results also found by Jayamaha and Mula(2010) and reported that a continuous decline of CRBs efficiency for the study period 2003 to 2005 by taking a sample of 108 CRBs operate in 2006. However, mean efficiency by districts shows that CRBs operate in Kurunegala, Gampaha, Hambantota and Kandy districts reported upward trend of efficiency scores from 2005 to 2010. These results revealed that comparing others they have produced the same outputs while reducing their inputs. This suggests that there are significant differences in the efficiency of CRBs by geographical locations. Prior studies also found the same (Jayamaha and Mula 2010).

New financial institutions entered the rural finance market in Sri Lanka, other commercial banks diversified their activities to include microfinance services, (CBSL 2006) and internal constraints, such as lack of awareness of best practices in microfinance, weak institutional capacity and a negative perception of the commercialization decision, hamper diversification of activities of CRBs, result in decreasing membership (Charitonenko and De Silva 2002) may have adversely affected CRBs efficiency. Therefore, the findings 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.

References

- Abeyaratna, D. B. (2007). "Deposit taking by non-banking institutions and emerging challenges for commercial banks & regulators." Retrieved 17th July 2007, from <http://www.apbsrilanka.org/general/articals/15an/artical-dheerendra.html>.
- CBSL (2006). Annual report. Colombo, Central Bank of Sri Lanka
- Charitonenko, S. and D. De Silva (2002). Commercialisation of microfinance in Sri Lanka. Manila, Asian Development Bank.
- Charnes, A., W. W. Cooper, et al. (1978). "Measuring the efficiency in decision making units." *European Journal of Operational Research*2(6): 429-444.
- Coelli, T., D. Rao, et al. (1998). *An Introduction to efficiency and productivity Analysis*. London, Kulvwer Academic Publishers group.
- Gant, R., D. Silva, et al. (2002). National microfinance study of Sri Lanka: Survey of practices and policies, The Australian Government's Overseas Aid Programme and GTZ.
- Jayamaha, A. and J. M. Mula (2010). Efficiency of cooperative rural banks in Sri Lanka- The impact of size and location. A paper presented on conference of the Accounting and Finance Association of Australia and New Zealand (AFAANZ) - 4-6 July, 2010. Christchurch, New Zealand. view paper at <http://www.afaanz.org/openconf-afaanz2010/openconf.php>.
- Jayamaha, A. and J. M. Mula (2011). "productivity and efficiency measurement techniques: identifying the efficacy of techniques for financial institutions in developing countries." *Journal of Emerging Trends in Economics and Management Sciences (JETEMS)*2(5): Oct. 2011.