Productive Efficiency of Primary Agricultural Credit Societies in Kerala, India

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Abstract

Co-operatives are having great relevance and significance in India because they are inspired by the principles of self-help and equality. Primary Agricultural Credit Societies (PACS) are 95,238 in number and form the base level of short-term co-operative credit structure in India. With more than 13 crores of people as members, these societies play a vital role in the financial inclusion of rural population. Unlike other states in India, people in Kerala have a higher dependency on co-operative credit institutions by having about 60% of its total population as members of PACS. Strengthening these institutions is vital for ensuring a strong foundation for the newly formed Kerala Co-operative Bank because the district and state co-operative banks rely more on PACS for their deposits and advances. In this paper, we are comparing these institutions with their peers and therefore the bench marking technique DEA is found to be more appropriate. The main focus of the study is to develop a model for estimating the productive efficiency of PACS in Kerala. The study has considered 168 PACS across the state of Kerala and found a significant variation in the relative efficiency scores among them. 117 PACS under CRS assumption and 98 PACS under VRS assumption are not even 50% efficient in comparison with their most efficient peers. The relative efficiency scores have been compared with other parameters also. When all PACS are working mostly under the same environment, these relative inefficiencies can be addressed and make these societies more profitable and financially stable.

Keywords: Co-operatives, Primary Agricultural Credit Societies, Productive Efficiency, DEA

Introduction

Co-operatives are having great relevance and significance in India, especially for rural population because they are inspired by the principles of self-help and equality. These institutions utilize individuals and their means to achieve their common goals and needs of the society. They function to secure the social interests and security of its members and not merely for financial gains. In India, majority of these institutions have weaker and low-income individuals as its members. Around 49% of total workforce in India are still employed in agricultural sector and contribute to 17% of the GDP. Thus, stable growth of this sector is very vital for the employment of the rural population as well as for maintaining price stability. As savings and other income sources are minimal for small farmers, agricultural credits are inevitable for the growth and stability of this sector.

Primary Agricultural Credit Societies (PACS) are 95238 in number and form the base level of short-term co-operative structure in India. With more than 13 crores of people as members, these societies play a vital role in the financial inclusion of rural population and their main functions are providing short-term and medium-term loans, agricultural inputs such as seeds, fertilizers, machinery etc to farmers, facilitating storage and marketing of produces, promoting thrift among low- and middle-income population by accepting deposits etc.

Unlike other states in India, people in Kerala has a higher dependency on co-operative credit institutions by having about 60% of its total population being members of PACS. (Table. 1 & 2 give the membership

pattern and financial position of PACS in Kerala & India.) The area of operation of PACS are restricted to a village, panchayat or municipality and are meant to meet the credit requirements and the basic banking needs of its members. They operate at the grassroot level of the co-operative credit structure and form the final link to the borrowers. They can perform banking function for their members without obtaining licence from Reserve Bank of India but they function in accordance with the Kerala Co-operative Societies Act, 1969.

Kerala is the first state in India to have all its households with at least one bank account. The state has achieved this status in 2014 and has one of the best banking networks in India. As per SLBC (State Level Bankers Committee) data, as on March 2019 Kerala has 6284 scheduled Commercial bank branches and 633 branches of Kerala Gramin Bank. In addition to this, there are 995 branches of Co-operative Banks and 1606 Primary Agricultural Credit Societies making Co-operative institutions well rooted and share 30% of bank branches, deposits and loans. These institutions play a key role in the social and economic development of the state.

Table No.1. Membership Pattern of PACS as on 31st March 2018

	Total Membership	Scheduled Caste	Scheduled Tribe	Small Farmers	Rural Artisans	Others & Marginal Farmers
Kerala	2,29,73,460	16,04,170	17,77,70	75,39,410	30,42,830	1,06,09,280
	100%	7%	1%	33%	13%	46%
India	13,05,47,380	1,48,83,120	94,42,640	4,36,98,450	72,54,660	5,52,68,510
	100%	11%	7%	34%	6%	42%

Source: NAFSCOB

Table No. 2. Financial Details of PACS as on 31st March 2018

	Paid Up Share Capital	Government	Reserves	Deposits	Borrowings	Working Capital
Kerala	182238.26	10639.8	687695.67	8319351.29	691240.53	7937599.62
India	1414199.58	80739.27	1679970.62	11963232.52	12833322.27	24356250.99

Source: NAFSCOB   **Amount in lakh**

The rural co-operative credit structure in Kerala are classified into short term and long-term. Under short term structure the State Co-operative Bank is at the apex level, District Co-operative Banks or the Central Co-operative Banks at the district level and at the base level there are Primary Agricultural Credit Societies (PACS). The Government of Kerala has now initiated the formation of Kerala Co-operative Bank, which is being referred as Kerala Bank, by integrating 13 district co-operative banks with the state co-operative bank. The Kerala Bank has been formed on 29th November 2019 and the three-tier of rural co-operative short-term credit structure has become two-tier in nature.

Productivity and Efficiency

Productivity is usually measured as ratio of outputs to inputs. Higher the ratio higher will be the productivity. Efficiency actually compares the observed volume of outputs to the maximum volume of outputs that can be produced from a given level of inputs or the observed volume of inputs used to the minimum volume of inputs required to produce a given level of outputs. The differences in values obtained from these comparisons are shown as inefficiency. So, efficiency is a relative concept and it involves maximization of outputs and minimization of inputs.

Productivity analysis is highly essential for addressing the inefficiencies of banking operations and gain competitive advantage. In earlier researches multiple ratios are used to analyse productivity and efficiency but it cannot give an overall value for each unit and therefore it is difficult to perform a comparative study among the firms. Recent studies are relying on benchmarking techniques and frontier analysis for measuring efficiency.

Productive efficiency comprises purely technical or physical component and allocative or price component. Former refers to the capacity to reduce wastage by producing maximum outputs or utilizing the minimum inputs. Thus, technical efficiency can have either an output maximization model or an input minimization model. The allocative efficiency is the ability to arrive at the optimal proportions of inputs and outputs considering the existing prices.

Efficiency of banking Institutions

Efficiency of banks are measured either under Production Approach or Intermediation Approach. This paper is based on production approach and it considers financial institution as a production unit, that converts its resources to deposits, loans and other income generated financial products and services. They process service requests for financial and non-financial transactions, applications of credit facilities, checks and other payment instruments, undertake necessary documentations and security check, provide safe custody and locker facility etc. Major studies that have worked on this approach are Drake & Howcroft (1994), Athanassopoulos (1997), Schaffnit et al.(1997), Camanho & Dyson (1999) etc. This study is focusing on the employee efficiency and hence production approach has been chosen for variable selection.

Ratio analysis cannot give a complete picture of each firm for comparing with others and due to this disadvantage recent studies are applying efficiency analysis through parametric and non-parametric techniques. Non-parametric techniques are widely applied since the introduction of Data Envelopment Analysis (DEA) by Charnes, Cooper and Rhodes in 1978. In 1997, Berger and Humphrey analysed efficiency studies of 130 financial institutions from 21 countries in which five different efficiency techniques were used. But "there is really no consensus on the preferred method for determining the best-practice frontier against which relative efficiencies are measured".

Data Envelopment Analysis DEA is a linear programming method based on the principle of optimization. It estimates the linear production function based on the observed set of data points that envelop all the data and calculate the relative efficiency of firms or organizational units which utilizes identical inputs to produce identical outputs. These organizational Units are termed as Decision Making Units (DMUs). For Benchmarking DMUs, DEA does not impose any predetermined functional structure on the data. That is, DEA does not assume a common production technology to all DMU's. But DEA identifies the best performing one among the similar organizations and flag it as the efficient or the best practice DMU. Then it calculates the inefficiencies in other DMUs by comparing them with the efficient one and thereby generates an efficient production frontier on a relative basis. DEA can also accommodate multiple inputs and outputs at a time and generate a relative efficiency score for each unit.

Review of Literatures

Productive Efficiency of Indian Banks has been studied by Kaur & Gupta, 2015 using panel data for the period from 2009 to 2013. The study is based on intermediation approach and efficiency is measured using DEA. The results show that SBI and its groups are found to be more efficient than private banks and other nationalized banks. (Jayaraman and Srinivasan, 2009) have conducted a study titled as "Relative Efficiency of Scheduled Commercial Banks in India (2001-08): A DEA Approach". The study has attempted to measure

the scale efficiency and to identify the best practice bank using an output-oriented approach. The inputs are cost of deposits, cost of borrowing, cost of labour and ratio of burden to total assets while the outputs are return on assets, return on advances and return on investments. As per the results except in the year 2006, around 60% of the banks considered are found to be scale efficient. The reasons for inefficiency can be high cost of labour, borrowings and lower return on assets.

(Gaurav & Krishnan, 2017) conducted a study on the efficiency of 297 District Co-operative Societies from the period 2002-14. The study shows that the efficiency values vary based on whether advances or investments are used as output. The efficiency scores also vary considerably across the states in India. The study recommended for innovative strategies for improving efficiency. Hussain A K, Z. and Natarajan, P conducted a study on the profitability of Primary Agricultural Credit Societies in Kerala in 2013 and the key finding is that higher productivity leads to profitability in PACS. The study also recommends effective utilization of manpower in co-operative societies for generating profit to balance their social commitments and viability.

The Government of Kerala has appointed an Expert Committee on the Formation of Kerala Co-operative Bank and it has submitted the report in April 2017. The report says that the PACS dependency on District Co-operative Banks (now merged to form Kerala Co-operative Bank) are much lower while DCBs rely more on PACS for deposits as well as lending. The excess funds of PACS contribute to around 50% if the total deposits in DCBs. The committee has recommended for strengthening PACS in Kerala for ensuring a strong foundation for the newly formed Kerala Co-operative Bank and also advised for conducting further studies regarding the functioning of these institutions.

Methodology

From the literature review we identified the requirement of conducting more in-depth studies on the internal functioning and strength of PACS. They are still relying on traditional methods for decision making. Hence the objectives of this study are to (1) develop a model for estimating the productive efficiency of PACS in Kerala and to (2) compare the efficiency scores with various parameters like age, number of members/customers and financial classification of societies. We cannot compare the functioning of PACS with any other financial institutions because they are more welfare oriented, socially committed and function based on co-operative principles. Hence, we are comparing these institutions with their peers and therefore the bench marking technique DEA is found to be more appropriate.

The population for the study is 1542 active PACS in Kerala. The whole state of Kerala has been divided into South, Central and North Region and two districts are selected randomly from each region. Hence 6 districts were selected out of 14 districts in Kerala. The sample comprises 168 PACS chosen randomly from each district; 28 from Kollam, 23 from Pathanamthitta, 30 from Kottayam, 37 from Ernakulam. 28 from Kozhikode and 22 from Kannur. Interview Schedule method is used for collecting data from the officials of PACS.

Table No. 3. PACS numbers as on 31st March 2019

PACS No.	Dormant	Under Liquidation	Active
1606	34	30	1542

Source: Department of co-operation, Government of Kerala.

Selection of Variables

The inputs and outputs are selected based on the theory of production approach. Inputs considered in the study are number of board members, number of employees and number of banking outlets of the society. The outputs are Value of Deposits and Value of Advances. The number of employees includes the permanent staff of the society for banking functions. Collection agents and part time employees are excluded.

Fig:1. Model for Efficiency Estimation
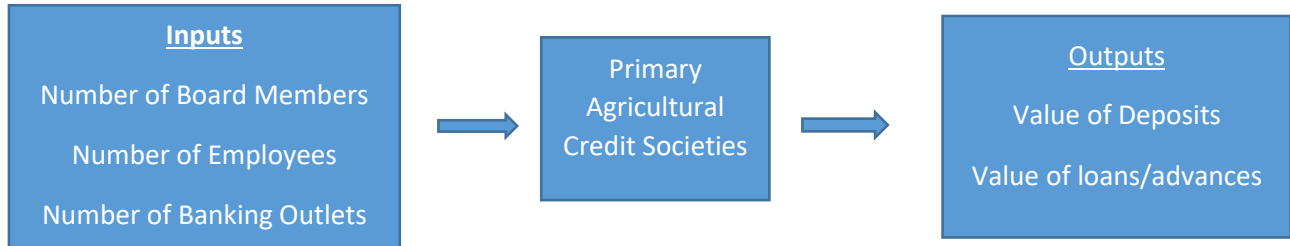
Analysis

1. In the estimation of efficiency either time series data or cross-sectional data can be used. In this study, cross sectional data as on 31st March 2019 are collected from 168 Primary Agricultural Credit Societies. Technical Efficiency score of each firm is calculated under both the assumptions, Constant Returns to Scale (CRS) and Variable Returns to scale (VRS). In DEA from the given data a production frontier is constructed and all the observed points are marked on or below the envelopment frontier. Under the CRS assumption 7 societies are found to be the most efficient while there are 14 most efficient societies under VRS – Output Oriented Method. From table no.4; a significant variation in the efficiency scores can be seen among the PACS. The efficiency scores of 117 PACS under CRS and 98 PACS under VRS are even 50% efficient in comparison with the most efficient ones.

Table No.4. Estimated Technical Efficiency Scores of PACS

Efficiency Scores	CRS	VRS
Equal to 1	7	14
.80 to .99	6	9
.60 to .79	14	18
.40 to .59	47	48
.20 to .39	64	62
Below 20	30	17

2. A district wise comparison shows PACS in Ernakulam district has got the highest efficiency scores both under CRS and VRS assumption while Pathanamthitta has got the lowest under CRS assumption and Kannur district has the lowest under VRS assumption. This may be because in Ernakulam district a greater number of societies are moving to modern banking technologies rather than sticking on to the traditional functioning.

Table No.5. District Wise Efficiency Scores

District	N	Mean CRS	Std. Deviation (Mean CRS)	Mean VRS	Std. Deviation (Mean VRS)
Kollam	28	.35	.19	.43	.24
Pathanamthitta	23	.27	.13	.34	.17
Kottayam	30	.42	.19	.47	.21
Ernakulam	37	.56	.22	.66	.23
Kozhikode	28	.44	.22	.51	.23
Kannur	22	.30	.28	.33	.28
Total	168	.41	.23	.47	.25

3. Age of the society or the number of years from the date of registration has been compared. The results show that the newly formed societies, that is age below 25 years are found to be the most efficient. This may be because the staff of these societies are more skilled and trained in modern banking technologies. They seem to be more professional because recent recruitments in societies are made from the competitive examinations conducted by the Kerala State Co-operative Service Examination Board and hence political interference is minimised.

Table No.6. Age Wise Efficiency Scores

Age	N	Mean CRS	Std Deviation (Mean CRS)	Mean VRS	Std. Deviation (Mean VRS)
Below 25	3	.63	.49	.96	.08
25-50	19	.38	.23	.42	.24
51-75	68	.40	.21	.47	.25
76-100	68	.40	.23	.46	.25
Above 100	10	.48	.28	.57	.26

4. The members of the society refer to its shareholders and they are also the customers as these societies are permitted to perform banking operations only for their members. The relationship between the number of members in the society and the efficiency scores are analysed. It shows that a steady increase in the efficiency of the society with increase in membership. The societies with more than 20000 members show the highest efficiency. The members of the society are its owners as well as its customers.

Table No.7. Membership and Efficiency Scores

Members	N	CRS Mean	Std Deviation (Mean CRS)	VRS Mean	Std. Deviation (Mean VRS)
Below 5000	21	.26	.22	.40	.30
5001 – 10000	59	.33	.16	.42	.24
10001 – 15000	40	.42	.22	.46	.24
15001 – 20000	28	.48	.18	.51	.18
Above 20000	20	.67	.25	.68	.25

5. The Government of Kerala has classified the societies into various classes based on their financial performance/status. It shows that societies belonging to higher classes are more efficient. Hence higher

efficiency contributes to financial performance. Thus, improving the efficiency scores are highly critical for attaining financial stability.

Table No.8. Financial Classification and Efficiency Scores

Class	N	Mean CRS	Std. Deviation (Mean CRS)	Mean VRS	Std. Deviation (Mean VRS)
Class 1 Super Grade	23	.66	.21	.692217	.2167227
Class 1 Special Grade	43	.49	.21	.520047	.2116528
Class 1	32	.38	.13	.444281	.2073139
Class 2	21	.41	.19	.502524	.2471143
Class 3	10	.31	.15	.392900	.2106748
Class 4	13	.20	.06	.299692	.2246491
Class 5	23	.22	.20	.324043	.2555610
Class 6	3	.09	.04	.130500	.0685894

6. A slack-based analysis gives the respective inefficient firms their input and output targets. It gives a detailed result for each DMU on their inefficiencies and gives the optimum production mix. Since we have taken 168 DMUs, the results are not shown in the paper but the individual firms can conduct a similar analysis to find out their relative position on efficiency terms and slacks. From the slacks, each DMU can estimate the target for each input and output, so that they can reduce wastage and improve efficiency scores.

Conclusion

The PACS in Kerala have higher share of Deposits and Advances than the District and State Co-operative Banks. As per the 'Expert Committee on the Formation of Kerala Co-operative Bank', the Credit to Deposit ratio of PACS as on March 2016 was 68% while that of commercial banks was 62%. PACS and their branches together constitute 4625 banking outlets and majority of them are in rural areas. The committee pointed out that at least during the initial years the performance of the Kerala Bank will rely mostly on the performance of PACS.

The study has considered 168 PACS across the state of Kerala and found significant variation in the relative efficiency scores among them. 117 PACS under CRS assumption and 98 PACS under VRS assumption are not even 50% efficient in comparison with their most efficient peers. When all PACS are working under the same environment, these inefficiencies can be addressed and can make these societies more profitable and financially stable. The PACS in Ernakulam district have better efficiency scores than that in other districts. The results show that newly formed societies (age lesser than 25years) have better efficiency scores. There is also a steady increase in the efficiency scores with increase in membership. The more efficient PACS are found to be having higher classification based on financial performance.

In this study we have applied the production approach for estimating efficiency and the inputs considered are number of board members, number of employees and number of banking outlets. Hence giving proper training and skill development programs can improve the efficiency scores. Application of more technology and innovation in providing banking services are also essential. In this highly competitive environment, co-operatives are banking on relationships and hence employees should work on maintaining rapport with the members. We found that a greater number of members make societies more efficient and therefore efforts should be taken to attract new members especially the young population. The Co-operative Department and the individual firms should employ more advanced techniques to analyse the performance and in

decision making processes. Even though lots of studies on PACS have already undertaken, in-depth studies on their internal functioning and governance are very limited. Further researches can be conducted in this area considering the rapid changes taking place in the banking and financial sector in India and across the world.

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