

FINANCIAL PERFORMANCE AND EFFICIENCY OF SELECTED COOPERATIVES IN MALAYSIA: RATIO AND DATA ENVELOPMENT ANALYSIS APPROACH

Fatin Syazwani Safiyuddin¹
Norazlina Abd Wahab²
Selamah Maamor³

¹Faculty of Business, Hospitality, Accounting and Finance (FOBHAF), MAHSA University, Malaysia,
(E-mail: fatinsyazwani@mahsa.edu.my)

²Institute of Shariah Governance and Islamic Finance (ISGaIF), Islamic Business School, Universiti Utara
Malaysia (UUM), Malaysia, (Email: norazlina.aw@uum.edu.my)

³Institut Penyelidikan & Inovasi Zakat, Islamic Business School, Universiti Utara Malaysia (UUM), Malaysia,
(E-mail: selamahm@uum.edu.my)

Article history

Received date : 5-9-2022
Revised date : 6-9-2022
Accepted date : 4-11-2022
Published date : 5-11-2022

To cite this document:

Safiyuddin, F. S., Abd Wahab, N., & Maamor, S.
(2022). Financial Performance and Efficiency of
Selected Cooperatives in Malaysia: Ratio and Data
Envelopment Analysis Approach. *International
Journal of Accounting, Finance and Business
(IJAFB)*, 7(44), 65 - 76.

Abstract: *Cooperatives are organizations that are formed jointly by members to meet their economic needs and interests. The role of cooperatives is to increase the socioeconomic status of the members as well as eliminate poverty problems. Nevertheless, the performance of cooperatives in Malaysia in terms of turnover is still low compared to the other countries. This will be a cause for concern because inadequacies of financial decisions lead to the failure of cooperatives. Hence, this study aims to evaluate the financial performance and efficiency of cooperatives in Malaysia. This study applies Ratio Analysis to evaluate the financial performance of the cooperatives. Data Envelopment Analysis (DEA) was also employed in this study to determine the efficiency scores of cooperatives over the period 2010 to 2017. DEA results obtained that inefficiency of managerial performance leads to the inefficiency of the overall technical efficiency. The study recommends that the management of cooperatives in Malaysia should enhance their managerial performance because pure technical efficiency was found to contribute less to overall technical efficiency.*

Keywords: *cooperatives, ratio analysis, data envelopment analysis, efficiency, sustainability*

Introduction

Cooperatives as an autonomous organisation of individuals united willingly to meet their common economic, social, and cultural needs and aspirations through a jointly-owned and democratically-controlled enterprise (International Co-operative Alliance (2019)). The idea of the creation of cooperatives commenced in 1799 by Robert Owen. After the efforts unsuccessful, the cooperative movement was revived by Rochdale Pioneer in 1844 (Hayati, Asha'ari, Ahmad Faizal, & Norbiha, 2008). Even though this effort was also unsuccessful, the idea of cooperation is still developing. The first cooperative was established in Germany in 1862 by Hermann Schulze-Delitzsch and then continued by Friedrich Wilhelm Raiffeisen (Mckillop, 2005). In 1864, Raiffeisen's first cooperative was founded in Neuwied, Germany (Guinnane, 2016).

In Malaysia, the initial objective to establish cooperatives is to help villagers to get financing without high interest. The efforts of local community towards the beginning of the cooperative movement were started in 1913 with the formation of "Syarikat Perniagaan dan Pertukangan Melayu." The Federated Malay States Posts and Telegraphs Cooperatives Thrift and Loan Society Limited (Syarikat Kerjasama Jimat Cermat dan Pinjaman Wang Pekerja-pekerja Jabatan Pos dan Telekom Berhad) was the first cooperative to be created at the time. It was registered on July 21, 1922.

Based on the history of the cooperative establishment above, we can understand that the cooperatives were formed with the intention to help farmers and small businesses in obtaining financial support without being exploited by the upper classes. Therefore, the cooperatives play a major role to increase the socioeconomic status of the members as well as eliminate poverty problems. However, the unsatisfactory performance of the cooperative sector has raised up concerns about the factors impacting its performance. The performance of cooperative is a significant issue because it would impact on their member's economy. As the main goal of the cooperative to increase the member's socioeconomics, the failure of cooperatives in terms of performance will affect the failure in creating wealth and reducing the poverty problem (Lidasan, 2018). When the members of the cooperative are dissatisfied with the achievements of the cooperative, most likely they decide to withdraw, and the membership of the cooperative will decrease.

In addition, the large number of cooperatives and members (see Table 1) makes the evaluation of the performance and efficiency of cooperatives very important because cooperatives are responsible for realizing the wishes of their members who want to improve their economic status.

Table 1: Statistics of Cooperatives by Functions

No	Functions	Number of cooperatives	Number of members	Share/ Fees	Asset		Turnover
					RM (million)		
1	Banking	2	976165	3899.37	117287.55	29937.84	
2	Credit	572	1175596	6787.91	15948.57	6451.40	
3	Agriculture	3237	619429	756.88	3888.13	1064.12	
4	Housing	307	145068	200.70	1050.75	136.01	
5	Industrial	356	19543	17.87	82.82	25.27	

6	Consumer	5,479	2232123	651.15	2291.62	1362.70
7	Construction	255	91723	38.37	174.70	52.08
8	Transportation	486	126398	80.08	361.55	591.25
9	Services	3935	1126468	3384.91	9447.78	1845.16
Total		14,629	6,512,513	15,817.21	150,533.48	41,465.83

Source: Malaysian Cooperatives Commission, 2020

Table 1 indicates the number of cooperatives in Malaysia according to their functions. There are 14629 cooperatives in Malaysia with 6512513 members. Moreover, cooperatives in Malaysia consist of 9 functions namely cooperatives banks, credit cooperatives, agricultural cooperatives, housing cooperatives, industrial cooperatives, consumer cooperatives, construction cooperatives, transportation cooperatives, and service cooperatives. All cooperatives are regulated by the Malaysian Cooperatives Commission. By looking at the number of cooperatives and members, cooperatives play a vital role to ensure the sustainability of the cooperatives in order to give benefits to their members. Therefore, the evaluation of financial performance and efficiency is important.

Through the evaluation of financial performance, over a period of time, management can recognize internal strengths and shortcomings. It may be used to compare firms in the same industry that are similar and forecast the firm's future financial performance. This evaluation shows the past and current performance of the cooperative as well as being able to show a forecast of future performance. Thus, financial performance analysis is important to improve performance of the cooperatives and to comprehend how financial management performs a crucial part in the growth of the cooperatives.

In terms of efficiency, it deals with managing limited resources as it concerns with optimal production with scarce resources. Efficiency examines how productive inputs are turned into outputs and considers both inputs and outputs. Efficiency is a key to achieve goals because if the cooperatives are efficient, the cooperatives know how to prioritize the inputs in order to generate a big number of outputs. It also helps the cooperatives to avoid wastage.

This paper intends to discover the financial performance and efficiency level of cooperatives in Malaysia. The following section provides the literature on cooperatives, financial performance, and efficiency. Section 3 explains the research methodology, section 4 reports the results. Finally, the last section offers some limitations of the study and recommendations.

Literature Review

Based on Neely, Gregory, & Platts (1995), performance measurement is a procedure of quantifying action leads to performance. It is also closely related to efficiency and effectiveness, thus, Neely et al., (1995) stated that a company's level of performance is determined by the efficiency and effectiveness of the acts it conducts. Berhanu Lakew, Meniga, & Gebru (2014) also stated that the practise of quantifying efficiency and effectiveness is known as performance measurement. The efficient frontier approach is superior to traditional financial ratio analysis as a performance indicator, according to Berger & Humphrey (1997). It is because financial ratios do not consider input prices and output mix (Berger & Humphrey, 1992).

Financial ratios are an alternative way of avoiding the issues that come with evaluating organisations of various sizes (Ross S.A., Westerfield R., Jordan B.D., 2007). Through the measurement of financial ratios, management can detect internal strengths and weaknesses throughout time. As stated by Altman (1968), financial ratios such as profitability, liquidity, and solvency ratios prevailed as the most significant indicators of bankruptcy. Shamsuddin, Mahmood, Ghazali, Salleh, & Nawawi (2018) also mentioned that financial ratios approach an indication of the firm position in the dimensions of profitability, liquidity, solvency, and efficiency. Borhan, Naina Mohamed, & Azmi (2014) stated that current ratio, debt ratio and net profit margin are substantial impact to company performance.

According to Sathyamoorthi, Mbekomize, Radikoko, & Wally-Dima (2016), ratio analysis can evaluate a company's financial health as well as make cross-company comparisons. Based on previous studies, several financial ratios were used to measure financial performance. As mentioned by Jolly (1985), financial success may be measured by looking at a firm's solvency, profitability, liquidity, and risk-taking ability. Maryam & Ummi Salwa (2017) used capital adequacy ratio, asset quality, management, earning and liquidity to examine the performance of banks in Malaysia and Indonesia. In terms of cooperatives, Da Silva, Leite, Guse, & Gollo (2017) utilized asset quality, management efficiency, earning and liquidity to measure the performance of credit cooperative in Brazil. Sathyamoorthi et al. (2016) employed profitability ratios, activity ratios, financial leverage ratios, liquidity ratios, and market prospect ratios to examine the financial performance of preferred savings and credit co-operative societies in Botswana.

Other than that, efficiency is described as the efficient use of resources to maximise the production of goods and services, with emphasis on the link between input resources and the output created by employing those inputs (Farrell, 1957). Kumbhakar & Lovell (2000) also stated that the efficiency is defined as the use of resources to maximise the production of goods and services. In addition, Kipesha (2013) defines efficiency as the proportion of input resources used to produce or deliver outputs, as well as how successfully organisations utilise their resources to produce goods and services.

In terms of cost and revenue efficiency, Al-Khasawneh, Bassetat, Aktan, and Pun Thapa (2012) compared Islamic banks to conventional banks operating in North African Arab countries. In this study, it was discovered that Islamic banks in that region had higher average revenue and efficiency scores than conventional banks. However, Islamic banks' revenue efficiency score grew at a slower rate than conventional banks. The cost efficiency result differed from one country to the next. The findings also show that both types of banks were quite close to one another, with conventional banks having a cost efficiency edge over Islamic banks over time.

Mohamed Hisham, Junaina, & Abdul Razak (2012) conducted research to compare the efficiency of Islamic and conventional banking in Malaysia. According to the findings of this study, there is no discernible difference between Islamic and conventional banks in terms of efficiency. Another study conducted by Mostafa (2011) investigated the efficiency of the top 100 Islamic banks. The finding in this study is the performance of various banks is sub-optimal, implying that there is potential for major improvement. Separate benchmarks were created as a result of probable resource minimization, and significant savings are possible on this account.

Other than banking and microfinance institutions, Asawaruangpipop & Suwunnamek (2014) conducted a study Savings and Credit Cooperatives Efficiency in Thailand. The study discovered that the state enterprise cooperative has the most efficient cooperatives and the highest average efficiency score, according to the types of cooperatives. In terms of cooperative number and efficiency score, the results of the best practised cooperatives of each form of cooperative show that private cooperatives are the most efficient.

In addition, Favalli, Maia, and Silveira (2020) also evaluated the relation between governance and financial efficiency of credit unions in Brazil. The study revealed that better governance substantially increases the efficiency of credit unions in terms of a higher level of credit operations per institution. Barros, Costa Moraes, Salgado Junior, and Souza Junior (2020) also assessed the efficiency in financial intermediation and the cost efficiency in banking service of credit unions in Brazil. The findings demonstrate a high level of efficiency in financial intermediation, with low variation over time, associated with a low efficiency in the banking service, in which few cooperatives have remained efficient over time. The cooperatives with highest efficiency in financial intermediation were also the most efficient in providing services.

Most previous studies discussed the financial performance, and efficiency of banks, microfinance institutions, and other financial institutions. However, the previous studies on financial ratio and efficiency were studied separately although financial performance and efficiency were closely related to each other to complement the findings of the study (Berger & Humphrey, 1992; Berger & Humphrey, 1997; and Abduh M.; Hasan S.M.; Pananjung A.G (2013). Hence, the purpose of this study is to extend the literature by assessing the financial performance and efficiency of Malaysian cooperatives. The financial performance and efficiency of cooperatives should be analysed, and the results are important to the cooperative's board of directors to take preventive action in order to avoid financial distress.

Research Methodology

In this study, 15 cooperatives that are listed consecutively in 100 best cooperatives from 2010 to 2017 are assessed by using unpublished data from Malaysian Co-operative Commission. Although this study involved cooperatives of various types of functions, the data used in this study were in the same category which large cluster category (cooperatives with an annual turnover of more than RM5 million).

The first objective of this study will use financial ratios to analyse the financial performance of cooperatives in Malaysia. Financial ratios can be used to interpret financial accounts or management accounting data. The major reasons for adopting ratios as a method of analysis are to compare distinct-sized institutions and to compensate for sector characteristics, allowing individual institution ratios to be compared to a sector benchmark. It also can be used to indicate the financial ratios that have been used to forecast such financial events of the cooperatives.

In order to use descriptive analysis to assess the financial performance level of the cooperatives, the financial ratios analysis will be utilized. It is because ratio analysis can help assess a company's financial health as well as make cross-company comparisons. This study utilizes five ratios analysis (equity, liquidity, leverage, profitability, and dividend payout ratio) in analysing the cooperative's performance, which is compatible with the cooperative sector as mentioned in Table 2.

Table 2: Description of ratio

Ratios	Description
Equity	It relates to the solvency ratio, which determines how much of an asset's value is financed by the owner's investment.
Liquidity	The cooperative's ability to meet short-term obligations.
Leverage	If the ratio is low, the cooperative may be underleveraged. If the cooperative ratio is high, while taking advantage of debt, may be over-levered.
Profitability	It denotes how much profit that can earn on an investor's dollar. The higher the ROA ratio, the higher the profitability.
Dividend Pay-out	It demonstrates the proportion of net income that was paid in dividends. The ratio can be utilized to predict future dividends.

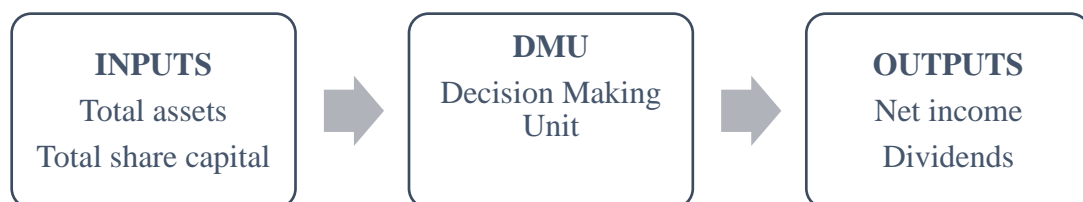
Source: simplified by author

Based on the Table 2, this study utilizes equity, liquidity, leverage, profitability, and dividend payout ratio to evaluate financial performance of Malaysian cooperatives. This number of ratios was limited by the non-disclosure of certain variables in the financial statements provided by the Malaysian Cooperative Commission. These ratios are selected based on the nature of the cooperative business. In fact, there is no decisive set of financial ratios to evaluate the performance of a business and a set of measures can be formulated to assess dissimilar aspects of financial performance from various perspective (Otley, 2002).

However, since the financial ratios data disregards the current market value of the institution and do not consider the input and output, thus, efficient frontier approaches as a complement to traditional financial ratios analysis in terms of quantifying performance. Thus, the second objective of this study is to evaluate the efficiency level of cooperatives. Data Envelopment Analysis (DEA) is employed to evaluate the technical efficiency, pure technical efficiency, and scale efficiency of Malaysian cooperatives.

With the purpose to use DEA, the inputs and outputs of the cooperatives need to be specified first. The production approach is used in this research. The production approach posits that cooperatives behave as producers in terms of collecting savings, providing other financial services, and returning profits to members in the form of dividends.

The inputs for this study were taken from Asawaruangpipop & Suwunnamek's (2014) model for analysing the efficiency of savings and credit cooperatives, while the outputs were based on the goal of analysing the efficiency of cooperatives in producing net income and dividends to their members. Thus, total assets and total share capital are inputs, whereas net income and dividends are outputs will be used in this study as stated in Figure 1.



Source: Author's own

Figure 1: DEA Process

As shown in Figure 1, the Data Envelopment Analysis (DEA) technique is a linear programming technique for determining how to make a specific decision for a unit or decision-making unit (DMU). Furthermore, the figure depicts the output obtained in relation to the resources used. This study used output-oriented DEA, in which a linear programme is built to ascertain a cooperative's potential output given its inputs if they functioned efficiently as cooperatives along the best practise frontier. The output-oriented used by considering the case where cooperatives may have fixed amount of resources and enquired to produce as much output as possible (Coelli, Rao, & Battese, 1998).

Results and Findings

The range of liquidity ratio is from 0 to 0.95. This result implies that the equity ratio for cooperatives in Malaysia is below the industry average and cooperatives should increase the total equity to improve the equity ratio. Cooperative 3 (credit cooperative) score the highest level of equity ratio in 2012 until 2015. Interestingly, equity ratios of Cooperative 15 (agriculture cooperative) are highest in 2016 and 2017, and the highest score among all cooperatives (0.89 and 0.95). This might be caused by National Cooperative Policy 2011-2020 emphasizes the agricultural sector as one of the success' keys in Malaysian cooperative movement.

The range for liquidity ratio is from 0 to 0.93. This finding shows that the liquidity ratio is below than industry average. The liquidity ratio lesser than 1.00 implies the cooperative is in bad financial health and easy to experience financial difficulties because the cooperatives are unable to meet short-term obligations. In order to improve the liquidity ratio, the use of current liabilities should be decreased. Cooperative 10 (banking cooperative) achieved high liquidity ratio in 2016 and 2017 (0.93 and 0.81) respectively. This may be contributed by the group's total assets rose 6.3% to RM105.45 billion from RM99.2 billion at the end of 2016. Other than that, deposits and savings increased to RM83.24 billion in 2017 compared RM77.90 billion in 2016 (Annual Report Bank Kerjasama Rakyat Malaysia, 2017).

The leverage ratio for all cooperatives is greater than 1. Cooperative 10 dominates the leverage ratios from 2010 to 2016 and Cooperative 11 dominates in 2017. Both cooperatives function as banking cooperatives. Hence, cooperative banks need a high leverage ratio so that cooperative banks have more capital reserves and can survive for the financial crisis.

The profitability ratio for all cooperatives is lower than 1.0%. Cooperative 10 (banking cooperative) indicates high profitability ratios in 2010, 2011, 2013 and 2015. This may due to variety of financial products such as takaful, ar-rahnu etc. Abdullah, Maamor, Hussin, Abdullah & Zamzuri Noor (2017) also stated that Cooperative 10 performed well in banking market as well as cooperatives market because Cooperative 10 operates as a one stop centre for their members.

Majority of the cooperatives are high dividend pay-out ratio (greater than industry average 0.4). Cooperative 15 (agriculture cooperative) achieves high dividend pay-out ratio in 2010, 2013, 2014 and 2015. This may be influenced by the implementation of the 9th and 10th Malaysian Plans that focus on the agricultural sector to improve the country's economy. Besides, the applicant of Cooperative 15 must pay the membership fees and purchase of farm units to qualify them to be a cooperative's member. Therefore, the condition may help to increase the share capital of the cooperative.

Now, we turn our discussion to the efficiency score of cooperatives from year 2010 until 2017. Table 3 shows the value of overall technical efficiency (OTE) for 15 Malaysian cooperatives.

Table 3: Overall Technical Efficiency of Cooperatives 2010 to 2017

Cooperatives	2010	2011	2012	2013	2014	2015	2016	2017
Coop 1	0.899	0.637	0.740	0.887	0.418	0.668	0.899	1.000
Coop 2	0.768	0.683	0.538	0.584	0.419	0.670	0.731	0.494
Coop 3	1.000	0.641	0.451	0.424	0.354	0.676	0.700	0.816
Coop 4	0.752	0.639	0.568	0.635	0.487	0.706	0.920	0.990
Coop 5	1.000	0.872	0.696	0.748	0.552	0.712	0.115	0.202
Coop 6	0.722	0.603	0.473	0.523	0.408	0.630	0.886	0.909
Coop 7	0.380	0.364	0.267	0.318	0.318	0.265	0.164	0.317
Coop 8	0.819	0.340	0.292	0.395	0.326	0.463	0.826	1.000
Coop 9	0.826	0.694	0.571	0.658	0.496	0.715	0.691	0.682
Coop 10	0.323	0.757	0.755	1.000	0.852	1.000	0.773	0.668
Coop 11	0.553	0.365	0.281	0.267	0.176	0.228	0.214	0.225
Coop 12	1.000	1.000	1.000	1.000	1.000	0.680	1.000	1.000
Coop 13	0.315	0.684	0.305	0.297	0.195	0.404	0.169	0.265
Coop 14	0.842	1.000	0.630	1.000	0.621	0.645	0.176	0.075
Coop 15	0.924	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Based on Table 3, Cooperative 15 (agriculture cooperative) is found to be efficient in all years under study except 2010. This may also be based on the government's introduction to the National Agro-food Base 2011-2020 (FAMA, 2011).

This section empirically investigates the pure technical efficiency in Malaysia's cooperatives over 2010 to 2017 period as stated in Table 4.

Table 4: Pure technical efficiency of cooperatives 2010-2017

Cooperatives	2010	2011	2012	2013	2014	2015	2016	2017
Coop 1	1.000	0.967	0.960	1.000	0.837	1.000	1.000	1.000
Coop 2	0.772	0.688	0.543	0.586	0.422	0.671	0.741	0.501
Coop 3	1.000	0.664	0.480	0.434	0.378	0.700	0.767	0.913
Coop 4	0.754	0.647	0.577	0.639	0.494	0.710	0.933	1.000
Coop 5	1.000	0.876	0.700	0.750	0.554	0.713	0.117	0.211
Coop 6	0.727	0.608	0.480	0.526	0.414	0.634	0.907	0.932
Coop 7	0.396	0.375	0.279	0.325	0.336	0.273	0.180	0.355
Coop 8	0.929	0.368	0.293	0.436	0.327	0.464	0.828	1.000
Coop 9	0.830	0.707	0.586	0.667	0.512	0.727	0.724	0.729
Coop 10	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Coop 11	0.578	0.398	0.333	0.330	0.278	0.347	0.402	0.410
Coop 12	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Coop 13	0.319	0.697	0.310	0.311	0.199	0.407	0.170	0.267
Coop 14	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Coop 15	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Based on Table 4, four cooperatives are efficient during the period of the study which are Cooperative 10 (banking cooperative), Cooperative 12 (service cooperative), Cooperative 14 (transportation cooperative), and Cooperative 15 (agriculture cooperative) implying that the managerial efficiency of the cooperative was good during that period. Cooperative 10 shows fully efficient from 2010 to 2017. Perhaps the number of members affect the efficiency because during the study period, the number of Bank Rakyat members rose to 943,464 in 2013, with 941,383 individuals and 2081 cooperatives making up the total (Annual Report Bank Kerjasama Rakyat Malaysia, 2017).

This section presents the scale efficiency of cooperatives from 2010 to 2017 as stated in Table 5.

Table 5: Scale efficiency of Cooperatives in 2010 to 2017

Cooperatives	2010	2011	2012	2013	2014	2015	2016	2017
Coop 1	0.899	0.658	0.770	0.887	0.500	0.668	0.899	1.000
Coop 2	0.995	0.993	0.990	0.996	0.993	0.998	0.986	0.985
Coop 3	1.000	0.966	0.939	0.976	0.938	0.966	0.912	0.893
Coop 4	0.997	0.988	0.984	0.993	0.986	0.995	0.987	0.990
Coop 5	1.000	0.996	0.994	0.997	0.995	0.998	0.985	0.958
Coop 6	0.994	0.991	0.985	0.994	0.987	0.994	0.977	0.976
Coop 7	0.962	0.970	0.956	0.979	0.948	0.971	0.911	0.893
Coop 8	0.881	0.924	0.994	0.907	0.998	0.999	0.997	1.000
Coop 9	0.995	0.982	0.975	0.987	0.968	0.983	0.955	0.935
Coop 10	0.323	0.757	0.755	1.000	0.852	1.000	0.773	0.668
Coop 11	0.956	0.919	0.843	0.811	0.632	0.658	0.532	0.548
Coop 12	1.000	1.000	1.000	1.000	1.000	0.68	1.000	1.000
Coop 13	0.988	0.982	0.983	0.956	0.983	0.993	0.995	0.991
Coop 14	0.842	1.000	0.630	1.000	0.621	0.645	0.176	0.075
Coop 15	0.924	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Based on Table 5, Cooperative 12 is efficient during the period of the study except in 2015. It may be due to low performance of Koperasi Permodalan Felda (KPF) in 2015. For example, KPF's investment has declined to RM5,330.12 million with recorded a reduction of 1.65% worth RM89.41 million compared in 2014 with recorded RM5,419.53 million (Annual Report Koperasi Permodalan Felda, 2016).

This section presents the efficiency of cooperatives from year 2010 to 2017 respectively. All the availability of data has been assessed by DEA to identify the level of efficiency each cooperative. The MEAN value of OTE, PTE and SE of cooperatives in Malaysia in 2010 to 2017 depicted in Table 6.

Table 6: Average of OTE, PTE and SE in 2010 to 2017 of 15 selected cooperatives

	OTE	PTE	SE
2010	0.741	0.820	0.917
2011	0.685	0.733	0.942
2012	0.571	0.636	0.920
2013	0.649	0.667	0.965

2014	0.508	0.583	0.893
2015	0.631	0.710	0.903
2016	0.618	0.718	0.872
2017	0.643	0.755	0.861
MEAN	0.631	0.713	0.909

According to Table 6, cooperatives in Malaysia exhibited 63.1%, 71.3% and 90.9% of overall technical efficiency (OTE), pure technical efficiency (PTE) and scale efficiency (SE) respectively during the study period. The findings also show that the cooperatives wasted 36.9% inputs in OTE, 28.7% inputs in PTE, and 9.1% inputs in SE. Inclusively, the results show that pure technical inefficiency dominated overall technical inefficiency over the research period (2010 to 2017).

Conclusion

In a nutshell, by looking at the results of the financial performance and efficiency, this study recommends that cooperatives need to improve the financial performance especially in profitability ratio, equity ratio, liquidity ratio, and leverage ratio. The strengthening strategies to achieve effective financial performance by increasing the current assets of the cooperatives instead of current liabilities. In addition, the cooperative should review their pay-out policies to ensure the sustainability. Even though the dividend pay-out ratio helps investors ascertain which cooperatives align best with their investment goals, if the returning money to the members more than its earning, it will probably be forced to lower the dividend or stop paying it altogether. Therefore, dividend pay-out ratio should be reviewed according to the cooperative industry standard.

In terms of efficiency, this result also shows that cooperatives should improve in terms of managerial performance to increase overall efficiency. The cooperatives may be required to adopt good corporate governance, which places credibility on a board of directors' legitimacy, which is determined by their knowledge and experience rather than their community's level of influence.

References

- Abduh, M., Hasan, S.M., & Pananjung, A.G. (2013). Efficiency and Performance of Islamic Banks in Bangladesh. *Journal of Islamic Banking and Finance*, 94-106.
- Altman, E. I. (1968). Financial Ratios, Discriminant Analysis and the Prediction of Corporate Bankruptcy. *The Journal of Finance*, 23(4), 589–609.
- Asawaruangpipop, P., & Suwunnamek, O. (2014). Analysis on savings and credit cooperatives efficiency in Thailand: A data envelopment analysis (DEA) approach. *Research Journal of Business Management*, 8(3), 242–253. <https://doi.org/10.3923/rjbm.2014.241.253>.
- Bank Kerjasama Rakyat Malaysia Berhad. (2017). *2016 Annual Report of Bank Kerjasama Rakyat Malaysia Berhad*. Retrieved from https://www.bankrakyat.com.my/c/mengenai/maklumat_kewangan/annual.
- Barros, M.G., Costa Moraes, M.B, Salgado Junior, A.P., Souza Junior, M.A.A. (2020). Efficiency of credit unions in Brazil: an analysis of the evolution in financial intermediation and banking service. *RAUSP Management Journal*, 55(3), 289-308.
- Berger, A. N., & Humphrey, D. B. (1992). Megamergers in banking and the use of cost efficiency as an antitrust defense. *The Antitrust Bulletin*, 37(3), 541-600.

- Berger, & Humphrey. (1997). Efficiency of Financial Institutions: International Survey and Direction for Future Research. *European Journal of Operational Research*, 175–212.
- Berhanu Lakew, T., Meniga, M., & Gebru, A. (2014). A study on financial performance of multipurpose cooperative unions of Tigray region, Ethiopia. *International Journal of Current Research*, 6(11), 9810–9815.
- Borhan, H., Naina Mohamed, R., & Azmi, N. (2014). The impact of financial ratios on the financial performance of a chemical company. *World Journal of Entrepreneurship, Management and Sustainable Development*, 10(2), 154–160. <https://doi.org/10.1108/wjemsd-07-2013-0041>.
- Coelli, T., Rao, D. S. P., & Battese, G. E. (1998). *An introduction to efficiency and productivity analysis*. Kluwer Academic Publishers.
- Da Silva, T. P., Leite, M., Guse, J. C., & Gollo, V. (2017). Financial and economic performance of major Brazilian credit cooperatives. *Contaduria y Administracion*, 62, 1442–1459. <https://doi.org/10.1016/j.cya.2017.05.006>.
- Farrell. (1957). The Measurement of Productive Efficiency. *Journal of the Royal Statistical Society*, 120(3), 253–290.
- Favalli, R.T, Maia, A.G., & Silveira, J.M.F.J. (2020). Governance and financial efficiency of Brazilian credit unions. *RAUSP Management Journal*, 55(3), 355-373.
- Guinnane, T. W. (2016). State support for the German cooperative movement, 1860–1914. *Central European History*, 45(2), 208-232.
- Hayati, M. S., Asha'ari, A., Ahmad Faizal, S., & Norbiha, K. (2008). *Gerakan Koperasi di Malaysia*. Maktab Kerjasama Malaysia.
- International Cooperative Alliance (2019). Cooperative identity, values & principles.
- Koperasi Permodalan Felda Malaysia Berhad. (2016). *2015 Annual Report of Koperasi Permodalan Felda Malaysia Berhad*. Retrieved from <https://www.kpf.my/informasi/pengumuman/62-informasi/laporan-tahunan-kewangan/184-laporan-tahunan.html>.
- Lidasan H., Ismail N., Rahman S (2018). Cooperative's Social Capital and Entrepreneurial Orientation: A Conceptual Framework. *International Academic Journal of Innovative Research*, 05(02), 26-36.
- Maryam, B. M., & Ummi Salwa, A. B. (2017). CAMEL ratio on profitability banking performance (Malaysia Versus Indonesia). *International Journal of Management, Innovation & Entrepreneurial Research*, 3(1), 30–39. <https://doi.org/https://doi.org/10.18510/ijmier.2017.314>.
- Mckillop, D. G. (2005). Financial cooperatives: structure, conduct and performance. *Annals of Public and Cooperative Economics*, 76(3), 301–305.
- Mostafa, M. (2011). Modeling Islamic Banks' Efficiency: A non-parametric frontier approach. *International Journal of Islamic and Middle Eastern Finance and Management*, 4(1), 7–29.
- Muhamad Abduh; Sidratul Mahabub Hasan; Alfatih Gesan Pananjung. (2013). Efficiency and Performance of Islamic Banks in Bangladesh. *Journal of Islamic Banking and Finance*, 94–106.
- Neely, A., Gregory, M., & Platts, K. (1995). Performance measurement system design. *International Journal of Operations & Production Management*, 15(4), 80–116. <https://doi.org/10.1108/01443579510083622>.
- Otley D. (2002). Measuring performance: The accounting perspective. *Business Performance Measurement: Theory and Practice*, 3-21.
- Ross, S., Westerfield, R., Jordan, B., Mazin, A., & Abidin, Z. F. (2007). Financial management

fundamentals in Malaysia. *Malaysia: McGraw-Hill*.

- Sathyamoorthi, C. R., Mbekomize, C. J., Radikoko, I., & Wally-Dima, L. (2016). An Analysis of the Financial Performance of Selected Savings and Credit Co-Operative Societies in Botswana. *International Journal of Economics and Finance*, 8(8), 180. <https://doi.org/10.5539/ijef.v8n8p180>.
- Shamsuddin, Z., Mahmood, S., Ghazali, P. L., Salleh, F., & Nawi, F. A. M. (2018). Indicators for Cooperative Performance Measurement. *International Journal of Academic Research in Business and Social Sciences*, 8(12). <https://doi.org/10.6007/ijarbss/v8-i12/5056>.