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EFFICIENCY COOPERATIVE AND ITS POTENTIAL FOR ABSORBING LABORIN INDONESIA

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Abstract

The number of cooperatives in Indonesia reaches hundreds of thousands, but of the many cooperatives only 40% are active. The data also shows that employment in these business entities is less than 1% of the total workforce absorbed in various business sectors in Indonesia. The main objective of this study is to measure the efficiency of cooperatives in Indonesia and see the long-term relationship between cooperative productivity and employment in Indonesia. This research is quantitative by using two data analysis tools of envelopment analysis (DEA and cointegration test. Data envelopment analysis is to measure the efficiency of cooperatives. Meanwhile, to look at employment absorption using cointegration test. This research uses three inputs, namely, own capital, external capital, and the number of managers and one output is the profit of the cooperative.As for the cointegration test, the variable used is cooperative efficiency with the number of workers in the cooperative sector in Indonesia.The data used are primary and secondary data.Primary data are data obtained from the field and secondary data from the ministry of cooperatives and small and medium enterprises of the Republic of Indonesia.The results of this research show that the level of efficiency of cooperatives in Indonesia is not yet efficient, however there is a long-term relationship between cooperatives and employment in Indonesia.

Keywords**: *Cooperative, Labor, DEA, Cointegration Test***

1. INTRODUCTION

Quantitatively, the development of cooperatives from year to year has increased. In terms of members, the number of people who are members of cooperatives reaches 9.2 percent of the total population of Indonesia (Ministry of Cooperatives and SMEs, 2022). This is a great strength, with the number of cooperatives reaching 127,124 cooperative units in Indonesia as a people-based economic movement (Azari, 2020). In terms of employment absorption, cooperatives are still not encouraging when compared to other types of businesses. The number of workers absorbed by the cooperative is 574,451 people. To overcome the problems of unemployment and poverty, one way out is community empowerment, through cooperatives and micro, small and medium enterprises (Sudjatmoko, 2019). Cooperatives are able to reduce poverty in developing countries (Bhukuth et al, 2018). Cooperatives are an important part of the economy in a developing country because they can generate realistic income, because cooperatives also contribute to reducing poverty, unemployment and increasing people's welfare. (Hasan et al, 2020). Even though the development is significant, cooperatives in Indonesia have internal problems such as weak management of cooperatives, member commitment to using products and services in cooperatives and mastery of technology (Azhari, 2020).

The main problem in this research is that hundreds of thousands of cooperatives in Indonesia have not been able to absorb a large workforce when compared to businesses that are not cooperative legal entities. The specific objective of the research is to predict the short-term productivity levels of cooperatives in Indonesia. The second objective is to see the cointegration of cooperative efficiency on employment absorption in Indonesia. Urgency This research is very important, where it was found the efficiency level of cooperatives and the long-term relationship between the productivity level of cooperatives and employment in Indonesia using the *data envelopment analysis* and *cointegration test approaches.*

2. LITERATURE REVIEWS

Cooperative

Cooperatives are a collection of people per person who have the same goal, namely mutual welfare (UU No. 25, 1992). Thus, the members of the cooperative have two functions at the same time as owners and users. The purpose of cooperatives is empowerment not only in the economy, but socially and psychologically for their activities. This means that cooperatives do not solely have the aim of seeking profit but far from that is achieving common prosperity. Cooperatives prioritize the strength of members rather than the strength of capital (Faedlulloh, 2015).

Cooperative Workforce

Labor is one of the important factors of production, because other production factors depend on labor productivity in producing production. The working age is the population aged 15-64 years (BPS RI, 2022). Absorption of labor is caused by the demand for labor in various economic sectors. So that the jobs that have been filled reflect the number of working people or the labor force that has worked.

One business entity that can be used to increase employment in order to reduce the unemployment rate is a cooperative business entity. From the data obtained, it turns out that cooperatives are able to absorb a workforce of 574,451 people in 2015. Cooperatives are an important part of the economy in a developing country because they can generate realistic income, because cooperatives also contribute to reducing poverty, unemployment and improving people's welfare (Hasan et al., al. 2020).

3. IMPLEMENTATION METHOD

Research Approach

This research is quantitative by using *data envelopment analysis* (DEA) and *concentration test.* The non-parametric approach of the DEA model is used in this research. DEA is a popular method for estimating efficiency and productivity, based on each input used and the output produced [10]. DEA is a non-parametric approach that has advantages. The advantage of DEA is that the model approach does not set specific conditions, such as the population parameter that is the parent of the research sample, its use is simpler, and it is easy to use because it does not require a lot of specification of functional forms.

Analysis Tools

This study uses the *Data Envelopment Analysis* (DEA) approach in which the output units produced can show an increasing, constant or decreasing proportion rather than an increase in input units. The use of the VRS model is used because the assumption of this model is that the ratio between the addition of input and output is not the same (variable *return to scale).* This means that the addition of input by x times does not or does not necessarily cause output to increase by x times, it can be smaller or greater than n times. Increasing the proportion can be *increasing return to scale* (IRS) or it can also be *decreasing return to scale* (DRS). The results of this model add a *convexity condition* for the weight values λ, by including them in the boundary model following: the value of the weight λ, by including it in the constraint model following:

$\sum_{j=1}^{n} \lambda j = 1$

Then the BCC model can be written with the following equation: λ Max π (DMU Efficiency Model VRS)

subject to:

$\sum_{j=1}^{n} xij\ \lambda ij\ \geq \pi io \qquad i = 1,2,\dots m$ (1)

$\sum_{j=1}^{n} yrj\ \lambda j\ \geq yio \qquad i = 1,2,\dots s$ (2)

$\sum_{j=1}^{n} \lambda j\ \geq 1 \qquad (VRS)$ (3)

$\sum_{j=1}^{n} \lambda j\ \geq \theta \qquad j = 1,2,\dots n$ (4)

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Where θ is the efficiency of the DMU, *n is* the number of DMUs, *m* is the number of inputs, *s is* the number of outputs, *xij* is the number of inputs to the i-DMUs j, *yrj is* the number of outputs to the r DMUs j λj the weights of the DMUs j for the calculated DMUs. Meanwhile, to calculate the level of cooperative productivity, researchers use the malmquist index, with the following formula:

$$M_o\left(x^t, y^t, x^{t+1}, y^{t+1}\right) = \frac{D_o^{t+1}\left(x^{t+1}, y^{t+1}\right)}{D_o^t\left(x^t, y^t\right)} \times \left[\frac{D_o^t\left(x^{t+1}, y^{t+1}\right)}{D_o^{t+1}\left(x^{t+1}, y^{t+1}\right)} \frac{D_o^t\left(x^t, y^t\right)}{D_o^{t+1}\left(x^t, y^t\right)}\right]^{\frac{1}{2}} \quad (5)$$

Where $D_o^t\left(x^{t+1}, y^{t+1}\right)$, the distance from the period t + 1 observation to the technology period t. The first ratio on the right side of Eq measures the change in relative efficiency between years t and t + 1. Next, the total factor productivity will be estimated by the following formula:

$$Mo\left(x^t, y^t, x^{t+1}, y^{t+1}\right) = \left[\frac{D_o^{t+1}\left(x^t, y^t\right)}{D_o^t\left(x^t, y^t\right)} \frac{D_o^{t+1}\left(x^{t+1}, y^{t+1}\right)}{D_o^t\left(x^{t+1}, y^{t+1}\right)}\right]^{\frac{1}{2}} \times \left[\frac{D_o^{t+1}\left(x^{t+1}, y^{t+1}\right)}{D_o^{t+1}\left(x^t, y^t\right)} \frac{D_{oc}^{t+1}\left(x^{t+1}, y^{t+1}\right)}{D_{oc}^{t+1}\left(x^t, y^t\right)} \frac{D_{oc}^t\left(x^t, y^t\right)}{D_{oc}^t\left(x^{t+1}, y^{t+1}\right)}\right]^{\frac{1}{2}} \quad (6)$$

Where: $\left[\frac{D^{t+1}\left(x^t, y^t\right)}{D_o^{t+1}\left(x^{t+1}, y^{t+1}\right)} \frac{D_o^{t+1}\left(x^t, y^t\right)}{D_o^t\left(x^t, y^t\right)}\right]^{\frac{1}{2}}$ = *Technical Changes* (7)

$\left[\frac{D^t\left(x^t, y^t\right)}{D_o^{t+1}\left(x^{t+1}, y^{t+1}\right)}\right]$ = *Pure Efficiency Changes* (8)

$\left[\frac{D^{t+1}\left(x^t, y^t\right) D^{t+1}\left(x^{t+1}, y^{t+1}\right)}{D_{oc}^{t+1}\left(x^t, y^t\right) D_{oc}^{t+1}\left(x^{t+1}, y^{t+1}\right)} \frac{D^t\left(x^t, y^t\right) D^t\left(x^{t+1}, y^{t+1}\right)}{D_{oc}^t\left(x^t, y^t\right) D_{oc}^t\left(x^{t+1}, y^{t+1}\right)}\right]^{\frac{1}{2}}$ = *Scale Efficiency Changes* (9)

Improvement in efficiency according to the value of the Malmquist index is worth greater than one. While the decrease in the value of efficiency is if it is less than 1. Likewise with *technical efficiency* and *efficiency change.* If the TECHch value is > 1, it means that there has been an increase in terms of technology in the production process, or the technical component is the main reason for increasing efficiency (TFP). Meanwhile, if EFFch > 1, it means that the input management process becomes an efficient output (frontier*).* With this formula, it is hoped that the productivity of cooperatives in 34 provinces can be measured non-parametrically.

Variable Input and Output

In this study the input variables used were the cooperative's own capital, outside capital, labor and the number of cooperative members while the output variables were the number of turnover and SHU of the cooperative.

Table 1. Input and Output Variables

Variable	definition	Inputs/Outputs
Owner's equity	The amount of capital owned by cooperatives originating from internal cooperatives in the form of principal savings, mandatory savings, reserves and grants in each district/city	Inputs
Outside Capital	Total capital sourced from outside the cooperative in the form of loans from members, other cooperatives, banks, financial institutions, issuance of bonds/other securities	Inputs
Labor	The number of workers absorbed in the cooperative sector	Inputs
Member	Owners as well as users of cooperative services and	Inputs

	are recorded in the book of cooperative members	
Turnover	Cooperative sales/income volume for one financial year	output
SHU	The difference between the income and costs of the cooperative in a one-year period	Output

4. RESULTS AND DISCUSSION

Cooperative Efficiency

In measuring the efficiency of cooperatives in Indonesia, this study uses the *Data Envelopment Analysis* (DEA) approach. The main component is measuring changes in the efficiency of a *Decision-Making Unit* (DMU) by looking at its Total Factor Efficiency (Total *Factor Productivity* /TFP). It should be noted that all data from the weighted average displayed in the results of the analysis using the *Malmquist index* with the DEA approach are in the form of geometric averages. The geometric average is very suitable for measuring the average change in percentage, ratio, index, or growth rate over time. This average is also able to find the average percentage change over a certain period of time. Therefore, the characteristics of the geometric mean are in accordance with the calculations on the *Malmquist index.*

Will briefly present the results of calculating the efficiency of cooperatives in each province in Indonesia during the 2010-2015 period as shown in Table 2 using VRS (*Variable Return to Scale*). The use of the VRS model is used because the assumption of this model is that the ratio between the addition of input and output is not the same (variable *return to scale)*. This means that the addition of input by x times does not or does not necessarily cause output to increase by x times, it can be smaller or greater than x times.

The value of 1,000 from the VRS indicates that the cooperative is on the *frontier line,* in other words, it is efficient. Meanwhile, if the number shown is less than 1 (<1), technically the cooperative in that province is not efficient (not on the *frontier line).*

On the other hand, if you want to know the productivity of a cooperative compared to other cooperatives in the same year, then the standard is seen from the average value of the productivity of the entire cooperative. If it is below the average, then the cooperative's efficiency level is below the national average. Cooperatives are considered to have high productivity in a period, if they are above the average productivity of all cooperatives in Indonesia. Of course, the value of perfect efficiency is indicated by an index number of 1,000 or 100%.

Table 2. Efficiency Cooperatives in Indonesia 2010-2015 Period
(*VRS-Output Oriented*)

No	Province	2010	2011	2012	2013	2014	2015	Average
1	Aceh	1,000	0.440	0.193	0.380	0.385	0.601	0.500
2	North Sumatra	0.667	0.648	0.597	0.749	0.354	1,000	0.669
3	Boast	0.593	0.440	0.465	0.665	0.198	0.277	0.440
4	Riau	0.344	0.578	0.299	0.407	0.191	0.351	0.362
5	Jambi	0.502	0.447	0.309	0.180	0.231	0.550	0.370
6	South Sumatra	0.422	0.417	0.346	0.378	0.536	1,000	0.517
7	Bengkulu	0.878	0.664	0.397	0.495	0.228	0.761	0.571
8	Lampung	0.372	0.936	0.833	0.216	0.314	1,000	0.612
9	Babylon	1,000	1,000	1,000	1,000	1,000	1,000	1,000
10	Riau Islands	0.872	0.901	0.361	0.206	1,000	1,000	0.723
11	Dki Jakarta	1,000	1,000	1,000	1,000	1,000	1,000	1,000
12	West Java	1,000	1,000	0.821	1,000	0.440	0.326	0.765

13	Central Java	1,000	0.244	1,000	0.383	0.153	0.111	0.482
14	Diy	0.512	0.449	0.376	0.303	0.119	0.451	0.368
15	East Java	1,000	1,000	1,000	1,000	1,000	1,000	1,000
16	Banten	0.689	0.504	0.390	1,000	1,000	0.469	0.675
17	Bali	1,000	1,000	0.335	0.364	0.184	0.360	0.541
18	Ntb	0.202	0.107	0.163	0.183	0.100	0.234	0.165
19	Ntt	0.217	0.669	0.511	0.435	0.267	0.576	0.446
20	West Kalimantan	0.376	0.258	0.278	0.237	0.117	0.187	0.242
21	Central Kalimantan	1,000	0.453	0.219	0.202	0.154	0.183	0.369
22	South Kalimantan	0.458	1,000	0.652	0.378	0.233	0.358	0.513
23	East Kalimantan	0.620	0.769	0.446	0.314	0.214	0.745	0.518
24	Southeast Sulawesi	0.076	0.048	0.037	0.063	0.028	0.079	0.055
25	Central Sulawesi	0.280	0.238	0.209	0.184	0.092	0.192	0.199
26	South Sulawesi	0.780	0.414	0.506	0.627	0.445	0.647	0.570
27	Southeast Sulawesi	1,000	0.194	0.070	0.025	0.186	0.261	0.289
28	Gorontalo	0.538	0.523	0.143	0.096	0.132	0.481	0.319
29	West Sulawesi	1,000	1,000	1,000	1,000	1,000	1,000	1,000
30	Maluku	0.572	0.097	0.383	0.018	0.200	0.503	0.296
31	Papuan	1,000	1,000	0.383	0.149	0.206	0.499	0.540
32	Shame	0.460	0.761	0.288	0.101	0.156	0.379	0.358
33	West Papua	0.226	1,000	0.756	1,000	0.968	1,000	0.825
Average		0.656	0.612	0.478	0.447	0.389	0.563	0.524

Source: Secondary data processed, (2022)

From Table 2 above, only four provinces have consistently efficient cooperatives during the 2010-2015 study period, namely Bangka Belitung, DKI Jakarta, East Java and West Sulawesi. This is because the output values in the four provinces have high figures, while the average input values are the same as cooperatives in other provinces. This result is reinforced by data from the Ministry of Cooperatives of the Republic of Indonesia, in the four provinces having a level of cooperative activity above 70%. (Ministry of Cooperatives and SMEs, 2022)

From the calculation results in Table 3 it is also illustrated that North Sulawesi province is the province that has the lowest efficiency score with an index value of 0.055 or 5.5%, followed by West Kalimantan (24.2%), Southeast Sulawesi (28.9%), and Maluku (29.5%). This is because the input value is large but not proportional to the output value produced.

The test results also show that the average province experienced an efficiency value for a certain period but was not stable, such as Central Java in the 2010 and 2012 periods had an index number of 1,000 or 100% but in 2011, 2013, 2014 and 2015 it obtained a value below 1,000. Overall, the average value of cooperatives in Indonesia during the study period was less than 100%, namely 52.4 %. This means that cooperatives in Indonesia are less efficient, in other words, 47.6 % of cooperatives in Indonesia are inefficient.

Co-integration of Cooperative Efficiency and Labor

Cointegration is a long-term relationship between variables which although individually are not stationary, but the linear combination between these variables becomes stationary. There are different methods for testing panel data co-integration. Methods that can be used to carry out cointegration tests include the Johansen and Kao methods. This test was conducted to see whether the variable has a long-term relationship between cooperative efficiency and employment.

To find out whether or not there is cointegration between the dependent and the independent variables, the Johansen and Kao cointegration test was carried out, by looking at the statistical tests. The significance level described in this study is 1%, 5% and 10%. Johansen and Kao test results can be seen in Table 3 below:

Table 3. Cointegration Panel Test Results

Test Name	Statistics Test	Prob
Johansen Fisher *Test*		
Fisher Statistics (Trace *Test)*	164,9399 ***	0.0000
Fisher Statistics *(Max Eigen Test)*	63,61760 ***	0.0000
Kao *test*	-3.45144 ***	0.0003

Source: Secondary data processed, 2022

*Description: * ** Indicates significant at the 1% level*

Table 3 shows a statistically significant test value with a probability value of less than 1%. This shows that the data used is cointegrated, which means that there is a long-term relationship between the efficiency of cooperatives and employment.

Cooperatives contribute to the process of reducing the unemployment rate, because they have absorbed labor (Yolandika et al, 2015). The large number of cooperatives has not been able to absorb labor in Indonesia. Based on existing data from 2010 to 2015, cooperatives were only able to absorb a workforce of 574,451 people. In other words, the average workforce in the cooperative sector absorbed is only two to three people. However, cooperatives can at least reduce the unemployment rate in Indonesia compared to other forms or types of businesses such as large businesses, micro, small and medium enterprises (MSMEs).

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5. CONCLUSION

From the research results it can be concluded that the level of efficiency of cooperatives in Indonesia is not efficient, this is evidenced by the efficiency value of cooperatives in Indonesia of 52.4 %, in other words less than 100%. Likewise, the absorption of labor from cooperatives in Indonesia is still below one percent when compared to business sectors other than cooperatives. However, the efficiency of cooperatives has a long-term relationship to employment in Indonesia.

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