

## PERFORMANCE AND EFFICIENCY OF VILLAGE UNIT CO-OPERATIVES IN MADIUN REGENCY

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### ABSTRACT

The purpose of cooperatives in improving its members' welfare can be achieved if the cooperative has good performance and efficiency. This study aims to (1) analyze the financial performance of KUD in Madiun Regency, (2) determine the factors that influence the profit of KUD, (3) evaluate the efficiency level of KUD in Madiun Regency and (4) determine the factors that influence the efficiency level. Financial performance was measured using financial ratio analysis. The efficiency level was measured by employing Data Envelopment Analysis (DEA), and multiple regression analysis was used to determine the factors influencing the profit and efficiency level of KUD in Madiun Regency. A total of 16 KUD's were used as research samples, with data used in each KUD covering data from 2015 to 2017. The results showed that KUD dominated liquidity, solvency, and profitability with unhealthy, not healthy, or very unhealthy criteria. Factors that significantly affect the profit are the number of members and the total business volume. Meanwhile, the efficiency level shows that most ( $\geq 50\%$ ) Village Unit Co-operative (KUD) in The Madiun Regency is inefficient. Factors that significantly influence KUD's efficiency level in the Madiun Regency are the director's age, the supervisory's education, the supervisory's experience, and the manager's experience. Furthermore, the study found a high positive correlation between financial performance (NPM) and KUD's efficiency level in Madiun Regency.

**Keywords:** Data Envelopment Analysis, efficiency, financial performance, Village Unit Co-operative

### INTRODUCTION

Cooperatives are associations whose members are people or bodies that provide freedom to enter and leave as members and work together as a family to achieve a common goal, namely the welfare of its members (Widiyanti & Sunindhia, 2008). One of the cooperatives that have long developed in Indonesia is the Village Unit Cooperative (KUD). According to Sukamdiyo (1996), the establishment of KUD aims to increase production and people's lives in rural areas.

According to law Number 25 of 1992, the purpose of the establishment of cooperatives is to advance the welfare of members in particular and society in general, as well as participate in building the national economic order in to create an advanced, just and prosperous society based on Pancasila and the 1945 Constitution. Increased welfare by cooperatives can be achieved through various kinds of benefits provided by cooperatives. Economic welfare benefits, marketing benefits, fulfillment benefits, and social benefits are some of the forms that cooperatives can provide their members (Rianse et al., 2013). Ojiagu et al. (2015) also stated that cooperative membership could increase member income.

The purpose of cooperatives in increasing welfare can be achieved if the cooperative has good performance and efficiency. Drucker (1982) states that performance is the level or tangible result that the company has achieved. Meanwhile, Doll & Orazem (1984) state that efficiency is a production method that produces maximum output and uses minimal input or production expenditure or, in other words, produces maximum production with limited resources.

Analyzing the performance of a cooperative can be done using financial ratio analysis as in the research of Kassali et al. (2013), who analyzed the performance of agricultural cooperatives in Ibadan Metropolis, Oyo, Nigeria using financial ratios. Meanwhile, to assess the efficiency of cooperatives, Siregar (2016) uses Data Envelopment Analysis (DEA) to measure the level of efficiency of the Village Unit Cooperative (KUD) in the Special Region of Yogyakarta.

Given KUDs importance as one of the village economy drivers, research is needed to see how the KUDs performance and efficiency of Keciially in Madiun Regency, East Java. The objectives of this study are: (1) to determine the financial performance of KUD in Madiun Regency; (2) knowing what factors affect the difference in KUD business results in Madiun

Regency; (3) knowing the level of efficiency of the KUD in Madiun Regency; and (4) find out what factors influence the level of efficiency of the KUD in Madiun Regency.

**METHOD**

The primary method used in this research is the descriptive analysis method. The descriptive method is a method that serves to describe or provide an explanation of the object under study through data or samples that have been collected as is.

The location of the research was determined purposively, namely in Madiun Regency, East Java. The selection of KUD, which is used as data, is done purposively, namely KUD, that have implemented RAT for the last three years.

**KUD Financial Performance Analysis**

KUD financial performance is measured using the financial ratio analysis method consisting of liquidity ratios, solvency, and profitability.

**1. Liquidity Ratio**

**a. Current Ratio (CR)**

CR is a ratio that shows the level of short-term debt security and the ability to pay these debts. The greater the CR value, the smoother the KUD's ability to pay its short-term debt. The formula for calculating CR is:

$$CR = \frac{Current\ Assets}{Current\ Liabilities} \times 100\% \quad (1)$$

**b. Quick Ratio (QR)**

QR is the KUD's ability to fulfill short-term obligations without paying attention to inventory because supplies need a relatively long time to be disbursed into cash. The greater the QR value, the better the KUD's ability to pay its short-term debt without paying attention to supplies. The formula for calculating QR is:

$$QR = \frac{Current\ Assets - Stock}{Current\ Liabilities} \times 100\% \quad (2)$$

**c. Cash Ratio**

Cash ratio is the ability to pay current debts

owed by the cooperative, which must be immediately met with available cash and bank (short-term savings). The greater the cash ratio value, the better the KUD's ability to pay short-term obligations with cash. The formula for calculating the cash ratio is:

$$Cash\ Ratio = \frac{Kas + Simpanan\ Bank}{Total\ Liabilities} \times 100\%$$

**2. Solvency Ratio**

**a. Total Debt to Equity Ratio (DER)**

DER is the ratio that shows how much of each rupiah of own capital is used as collateral for the entire debt. The formula for calculating DER is:

$$DER = \frac{Total\ Debt}{Own\ Capital} \times 100\% \quad (4)$$

**b. Debt Ratio**

The debt ratio shows how much of the total fund needs are spent on debt or how many assets are used to guarantee the debt. The formula for calculating Total Debt to Total Capital Ratio is:

$$Debt\ Ratio = \frac{Total\ Debt}{Total\ Assets} \times 100\% \quad (5)$$

**3. Profitability Ratio**

**a. Net Profit Margin (NPM)**

NPM is the ratio used to measure the profit margin in terms of KUD is SHU on sales. The greater the margin, the greater the KUD's ability to obtain SHU, while a low NPM indicates the company's inefficiency. The formula for calculating NPM is:

$$NPM = \frac{SHU}{selling} \times 100\% \quad (6)$$

**b. Return of Equity (ROE)**

ROE is the ability of a cooperative with its capital working in it to generate profits. The higher the value, the better the ability to generate profits. The formula for calculating ROE is:

$$ROE = \frac{SHU}{Own\ Capital} \times 100\% \quad (7)$$

**c. Return on Assets (ROA)**

ROA is the ability of a cooperative with working assets to generate profits. Return on Assets compares a net amount of any remaining annual income (SHU) and assets. The formula for calculating ROA is:

$$ROA = \frac{SHU}{Total\ Assets} \times 100\% \quad (8)$$

Analysis of Factors – Factors Affecting a Net Amount of Any Remaining Annual Income (SHU)

The model of the method of factors affecting SHU is analyzed using multiple linear regression equations. The equation model used is as follows:

$$\ln Y = \beta_0 + \beta_1 \ln X_1 + \beta_2 \ln X_2 + \beta_3 \ln X_3 + \beta_4 \ln X_4 + \varepsilon \dots\dots\dots(9)$$

Description:

- lnY = SHU KUD
- β<sub>0</sub> = intercept
- β<sub>1</sub> - β<sub>4</sub> = regression coefficient
- lnX<sub>1</sub> = number of members (person)
- lnX<sub>2</sub> = member capital (IDR)
- lnX<sub>3</sub> = external capital (IDR)
- lnX<sub>4</sub> = volume of business (IDR)
- ε = error

**Analysis of KUD Efficiency Level**

The KUD’s efficiency level in Madiun Regency is obtained using the Data Envelopment Analysis (DEA) method. The model used is the Charnes, Cooper, and Rhodes (CCR) model assuming the CRS (Constant Return to Scale) and the BCC model assuming VRS (Variable Return to Scale). Efficiency measurements carried out are input-output oriented. Each KUD analyzed was measured for its relative efficiency. The level of the relative efficiency of a KUD is said to be efficient if it has a relative efficiency value of 1, while an inefficient KUD is indicated by a relative efficiency level of less than 1.

In this study, DEA analysis was carried out on 16 KUDs in Madiun Regency with data from 2015 to 2017. DEA analysis was carried out using the DEA Solver LV (V8) software with the use of input and output variables as follows:

- a. Output variable: remaining results of operations
- b. Input variables: own capital, outside capital, number of members, and total cost

**Analysis of Factors – Factors Affecting KUD Efficiency Level**

Identification of the factors that influence the KUD’s efficiency level in the Madiun Regency was carried out using regression analysis. The relative efficiency value of the CRS assumption is used as the dependent variable. Consideration from the rationality side, namely that the KUD should

operate in a CRS condition so that the CRS assumption’s relative efficiency value is used as the dependent variable. In a mathematical model, the relationship between the relative efficiency level of the KUD in Madiun Regency and the independent variables is as follows:

$$\ln Y_{it} = \beta_0 + \beta_1 \ln X_{1t} + \beta_2 \ln X_{2t} + \beta_3 \ln X_{3t} + \beta_4 \ln X_{4t} + \beta_5 \ln X_{5t} + \beta_6 \ln X_{6t} + \beta_7 \ln X_{7t} + \beta_8 \ln X_{8t} + \beta_9 \ln X_{9t} + \varepsilon \dots\dots\dots(10)$$

Description:

- lnY<sub>it</sub> = KUD relative efficiency levels assuming CRS
- β<sub>0</sub> = intercept
- β<sub>1</sub> – β<sub>9</sub> = regression coefficient
- lnX<sub>1</sub> = board chairman’s age (years)
- lnX<sub>2</sub> = supervisor’s chief age (years)
- lnX<sub>3</sub> = manager's age (years)
- lnX<sub>4</sub> = education level of chairman of the committee (years)
- lnX<sub>5</sub> = education level of the chief supervisor (years)
- lnX<sub>6</sub> = manager's education level (years)
- lnX<sub>7</sub> = board chairman's experience (years)
- lnX<sub>8</sub> = chief supervisor's experience (years)
- lnX<sub>9</sub> = manager's experience (years)
- i = the i<sup>th</sup> observation
- t = period
- ε = error

**RESULTS AND DISCUSSION**

**Financial Performance of KUD**

**1. Liquidity**

**a. Current Ratio**

The financial performance of KUD based on the Current Ratio value is classified by referring to the Regulation of the State Minister for Cooperatives and SMEs of the Republic of Indonesia Number 06/Per/M.KUKM/V/2006.

Table 1. Financial Performance Criteria for KUD based on Current Ratio values in 2016 and 2017

Interval CR	Criteria	Number of KUD			
		2016	%	2017	%
<125% or >325%	Very Unhealthy	4	25	8	50
125% s/d <150% or 300% up to 325%	Unhealthy	8	50	4	25
150% s/d <175% or 275% up to 300%	Fairy healthy	1	6.25	1	6.25
175% s/d <200% or 250% up to 275%	Healthy	2	12.50	1	6.25
200% up to 250%	Very Healthy	1	6.25	2	12.50
Total		16	100	16	100

Source: Secondary data processed (2017)

Based on Table 1, in 2016, most of the KUD in the Madiun Regency had an unhealthy financial performance. Meanwhile, in 2017 there

was a general decline in performance as indicated by the KUD’s dominance with a very unhealthy performance. Meanwhile, in 2016 and 2017, the

accumulation of KUD with the criteria very unhealthy, not healthy, and unhealthy was more than the accumulation of KUD, which had the criteria of being fairly healthy and healthy. So it can be concluded that most of the KUD in the Madiun Regency has a bad current ratio value.

b. Quick Ratio

Kasmir (2016) states that KUD's financial performance based on the Quick Ratio value is classified. The classification of KUD financial performance based on the Quick Ratio value, which refers to Kasmir (2016), is presented in Table 2.

Table 2. Financial Performance Criteria for KUD based on the Quick Ratio value for 2016 and 2017

Quick Ratio Value Interval	Criteria	Number of KUD			
		2016	%	2017	%
<150	Less healthy	9	56.25	8	50
≥150	Healthy	7	43.65	8	50

Source: Secondary data processed (2017)

The quick ratio overrides the inventory when guaranteeing current debt because inventory takes relatively longer to cash in than other components of current assets. Based on Table 2, in 2016, there were nine KUDs with unhealthy criteria, and in 2017 there were 8 KUD's with unhealthy criteria. The standard used to assess the quick ratio, according to Kasmir (2016), is 1.5 times or 150%, meaning that the minimum value of the quick ratio on the KUD is 150%.

c. Cash Ratio

The latest KUD liquidity analysis, namely cash ratio, shows that only 2 KUDs in 2016 and 4

KUDs in 2017 have healthy criteria according to the Kasmir (2016) reference. The results of the classification of KUD financial performance based on the cash ratio value, which refers to Cashmere (2016), are presented in Table 3. According to Kasmir (2016), the industry standard for the cash ratio value is 50%. Based on each KUD's cash ratio value, there are only two KUDs with good cash ratio criteria in 2016 and four KUDs in 2017. The cash ratio value is used to measure how much cash is available to pay debts. It means that this value shows the actual ability of the KUD to pay its short-term debts.

Table 3. Financial Performance Criteria for KUD based on the value of Cash Ratio in 2016 and 2017

Cash Ratio Value Interval	Criteria	Number of KUD			
		2016	%	2017	%
<50	Unhealthy	14	87.50	12	75
≥50	Healthy	2	12.50	4	25

Source: Secondary data processed (2017)

2. Solvency

a. Debt to Equity Ratio (DER)

The financial performance of KUD based on the value of Debt to Equity Ratio (DER) is classified according to the Regulation of the State Minister for Cooperatives and SMEs of the Republic of Indonesia Number 06/Per/M.KUKM/V/2006. There are 10 KUD's in 2016 and 9 KUD's in 2017, which are categorized as very unhealthy, unhealthy, and healthy. Based

on the DER value, it can be said that most of the KUD's in the Madiun Regency have poor financial performance. Based on Table 4, the number of KUD's with very unhealthy criteria increased in 2017, wherein in 2016, the number was 5, and in 2017 it was 6. Meanwhile, in the healthy criteria, the number of KUD also increased in 2017, indicating a KUD that has improved its financial performance is getting better.

Table 4. Financial Performance Criteria for KUD based on the value of Debt to Equity Ratio in 2016 and 2017

Interval DER	Criteria	Number of KUD			
		2016	%	2017	%
>200%	Very Unhealthy	5	31.25	6	37.50
>150% s/d 200%	Unhealthy	2	12.50	0	0
>100% s/d 150%	Fairly healthy	3	18.75	3	18.75
>70% s/d 100%	Healthy	3	18.75	3	18.75
≤70%	Very Healthy	3	18.75	4	25
Total		16	100	16	100

Source: Secondary data processed (2017)

Table 5. Financial Performance Criteria for KUD based on the value of Debt to Equity Ratio in 2016 and 2017

Interval Debt Ratio	Criteria	Number of KUD			
		2016	%	2017	%
>80%	Very Unhealthy	0	0	1	6.25
>60% s/d 80%	Unhealthy	5	31.25	4	25
>50% s/d 60%	Fairy healthy	2	12.50	2	12.50
>40% s/d 50%	Healthy	5	31.25	3	18.75
≤40%	Very Healthy	4	25	6	37.50
Total		16	100	16	100

Source: Secondary data processed (2017)

b. Debt Ratio

The financial performance of KUD based on the Debt Ratio value is classified according to the Regulation of the State Minister for Cooperatives and SMEs of the Republic of Indonesia Number 06/Per/M.KUKM/V/2006. Based on Table 5, in 2016 and 2017, most cooperatives were categorized as fairy healthy and healthy. It is indicated by the accumulation of KUD in the criteria of being fairy healthy and healthy in 2016 and 2017, respectively amounting to 9 or more than the accumulation of KUD with the criteria very unhealthy, unhealthy, and healthy. So, if a general conclusion is drawn based on the debt ratio value, most of the KUD's in the Madiun Regency has a reasonably good financial performance, although there are KUD's that are categorized as unhealthy and even very healthy.

3. Profitability

a. Net Profit Margin (NPM)

The results of calculating the financial performance of KUD based on the value of Net Profit Margin (NPM) are classified by referring to the Regulation of the State Minister for Cooperatives and SMEs of the Republic of Indonesia Number 06/Per/M.KUKM/V/2006. Based on Table 6, when viewed individually, not all KUDs are said to be healthy or healthy enough according to the criteria for the Regulation of the State Minister for Cooperatives and SMEs of the Republic of Indonesia Number 06/Per/M.KUKM/V/2006. It can be seen in Table 6 that there are five KUDs with criteria below that are fairy healthy in 2016, and six KUDs with criteria below are fairy healthy in 2017. In general, most of the KUD's in the Madiun Regency have financial performance based on the NPM value with the criteria fairy healthy and healthy.

Table 6. Financial Performance Criteria for KUD based on Net Profit Margin in 2016 and 2017

Interval NPM	Criteria	Number of KUD			
		2016	%	2017	%
<1%	Very Unhealthy	0	0	0	0
1% s/d <5%	Unhealthy	1	6.25	3	18.75
5% s/d <10%	Fairy healthy	4	25	3	18.75
10% s/d <15%	Healthy	4	25	1	6.25
≥15%	Very Healthy	7	43.75	9	56.25
Total		16	100	16	100

Source: Secondary data processed (2017)

b. Return on Equity (ROE)

The results of calculating the financial performance of KUD based on the value of Return on Equity (ROE) are classified by referring to the Regulation of the State Minister for Cooperatives and SMEs of the Republic of Indonesia Number 06/Per/M.KUKM/V/2006. The criteria for the financial performance of KUD based on the ROE value show that most of the KUD's in the Madiun Regency have poor performance. It can be seen in the information in Table 7, namely the accumulation of KUD with the criteria very unhealthy, unhealthy, and less healthy than the accumulation of criteria being fairy healthy and healthy. The value of ROE can indicate how management manages its capital. A high ROE

value means that KUD can operate more efficiently in managing its capital compared to KUD with a low ROE value.

Table 7. Financial Performance Criteria for KUD based on the Return on Equity value in 2016 and 2017

Interval ROE	Criteria	Number of KUD			
		2016	%	2017	%
<3%	Very Unhealthy	4	25	3	18.75
3% s/d <9%	Unhealthy	4	25	7	43.75
9% s/d <15%	Fairy healthy	2	12.50	2	12.50
15% s/d <21%	Healthy	5	31.25	3	18.75
≥21%	Very Healthy	1	6.25	1	6.25
Total		16	100	16	100

Source: Secondary data processed (2017)

Table 8. Financial Performance Criteria for KUD based on the Return on Assets in 2016 and 2017

Interval ROA	Criteria	Number of KUD			
		2016	%	2017	%
<1%	Very Unhealthy	2	12.50	2	12.50
1% s/d <3%	Unhealthy	6	37.50	7	43.75
3% s/d <7%	Fairy healthy	6	37.50	4	25
7% s/d <10%	Healthy	1	6.25	2	12.5
≥10%	Very Healthy	1	6.25	1	6.25
Total		16	100	16	100

Source: Secondary data processed (2017)

c. Return on Assets (ROA)

The results of the calculation of KUD financial performance based on the value of Return on Assets (ROA) are classified by referring to the Regulation of the State Minister for Cooperatives and SMEs of the Republic of Indonesia Number 06/Per/M.KUKM/V/2006. The last profitability analysis is a return on assets. This ratio describes the rate of return on each investment or assets used. Based on Table 8, most of the KUD's in the Madiun Regency have poor performance. It can be seen from the accumulation of KUD, which was categorized as very unhealthy, unhealthy, and healthy in 2016 and 2017, more than the accumulation of KUD, which was categorized as fairly healthy and healthy.

The ROA value indicates how efficient the assets are used to generate SHU. A low ROA value indicates less productive assets, such as rusty equipment, so that productivity decreases. Meanwhile, a high ROI value indicates that KUD can maximize the use of its assets.

Factors-Factors Affecting SHU

Factors affecting SHU were analyzed using multiple linear regression equations. After testing the classical assumptions, a regression model of the factors that influence SHU is obtained, as shown in Table 9. The value of Adjusted R Square is 0.876 or 87.6%. This value means that 87.6% of the dependent variable (SHU) variation can be explained by the independent variables (number of members, member capital, external capital, and business volume). In comparison, the remaining 12.4% is explained by other variables, not in the model.

Based on the analysis in Table 9, the F-sig value is 0.0000, so this means that the independent variables (number of members, member capital, external capital, and business volume) jointly and significantly influence the dependent variable (SHU). Based on the analysis in Table 9, partially, the variables that significantly affect SHU are the number of members and business volume with coefficients of 0.478 and 0.484, respectively.

Table 9. Results of Analysis of Factors Affecting SHU KUD in Madiun Regency

Variable	Sign of Hope	Coefficient	t-Count	t-sig.
Constants	+	0.836 <sup>ns</sup>	-0.435	0.666
Number of Members	+	0.478 <sup>**</sup>	2.033	0.048
Member Capital	+	0.062 <sup>ns</sup>	0.585	0.562
External Capital	+	0.188 <sup>ns</sup>	1.59	0.119
Volume of Business	+	0.484 <sup>***</sup>	3.274	0.002
R Square				0.887
Adjusted R Square				0.876
F-Count				84.163
F-sig.				0.00000

Source: Secondary data processed (2017)

KUD Efficiency Level

The KUD's efficiency level in Madiun Regency was analyzed using the Data Envelopment Analysis (DEA) method. A total of 16 KUD's with data from 2015 - 2016 were sampled for the DMU in this method. The efficiency produced by the DEA method is relatively efficient that measured between DMUs. The input variables used are the number of members, the amount of own capital, the amount of outside capital, and the total cost. While the output variable used is SHU.

DEA Input Orientation (CRS and VRS Assumption)

The number of efficient and inefficient DMUs, along with their percentages, can be seen in Table 10. The results of measuring the efficiency of input orientation show that from 2015 to 2017, most of the DMUs were not efficient either with the CRS or VRS assumptions. It is indicated by the large percentage of inefficient

DMU on both the CRS and VRS assumptions showing a value of  $\geq 50\%$ . When viewed from an efficient DMU, DMU 5 and 14 are stable DMUs that are always efficient on the assumption of CRS and VRS every year.

The efficient DMU on the CRS assumption every year always has a smaller percentage than the inefficient DMU. The number of efficient DMUs in 2015 and 2016 was 3, while in 2017, the efficient DMUs increased to 5 DMUs. When viewed in DMU 3 and 4, the two DMUs were inefficient in 2016 and then increased to efficient DMUs in 2017. Furthermore, in 2015, DMU 4 was efficient, and then in the following year, it decreased becomes the inefficient DMU. It happened in DMU 4 because, in 2016, DMU 4 experienced an increase in the number of inputs in the form of own capital and total costs, but the SHU produced was less than the previous year.

Table 10. Efficient and Inefficient DMU based on CRS and VRS Input Orientation Assumptions

Karakteristik	CRS			VRS		
	2015	2016	2017	2015	2016	2017
ΣDMU Efisien	3	3	5	5	7	7
% DMU Efisien	18.75	18.75	31.25	31.25	43.75	43.75
ΣDMU Inefisien	13	13	11	11	9	9
% DMU Inefisien	81.25	81.25	68.75	68.75	56.25	56.25
Total DMU	16	16	16	16	16	16
Total %	100	100	100	100	100	100

Source: Secondary data processed (2017)

Unlike the CRS assumption, the VRS assumption has a more excellent percentage value of efficient DMU than the CRS assumption every year. According to Charnes et al. (1994) cit. Othman et al. (2016), the efficiency value in the CRS assumption has a smaller value or the same as the efficiency value in the VRS assumption, due to differences in the scale size of each DMU. Furthermore, Burger and Moormann (2008) cit Othman et al. (2016) revealed that the BCC model is more flexible than the CCR model.

Based on the assumption of VRS, the percentage of efficient DMU is 31.25%, 43.75%, and 43.75% in 2015, 2016, and 2017. These percentages indicate that the assumption of efficient DMU VRS shows an increasing trend. Even though it increases, the overall percentage of inefficient DMUs each year is still greater than efficient DMUs, meaning that there are still more inefficient DMUs than efficient DMUs.

The number of efficient DMUs in 2016 is based on the VRS assumption. It shows that, in 2016, DMU-2 and DMU-9 operated more efficiently than the previous year. However, when entering 2017, DMU-2 and DMU-9 experienced decreased efficiency scores and became inefficient. It happens because, in 2017, DMU-2 uses its capital input, and the total cost is more but produces less SHU, whereas in DMU-9 uses more of its capital input and outside capital but produces less SHU.

DEA Output Orientation (CRS and VRS Assumption)

The number of efficient and inefficient DMUs and their percentages can be seen in Table 11. Based on Table 11, from 2015 to 2017, most DMUs have not been efficient, either assuming CRS or VRS. The percentage of DMU that is inefficient on both the CRS and VRS assumptions shows a  $\geq 50\%$  value each year. DMU 5 and 14 are efficient DMUs from 2015 to 2017 on the assumptions of CRS and VRS.



Table 11. Efficient and Inefficient DMU based on the Assumptions of CRS and VRS Output Orientation

Characteristic	CRS			VRS		
	2015	2016	2017	2015	2016	2017
Efisien	3	3	5	5	7	7
% Efisien	18.75	18.75	31.25	31.25	43.75	43.75
Inefisien	13	13	11	11	9	9
% Inefisien	81.25	81.25	68.75	68.75	56.25	56.25
Total DMU	16	16	16	16	16	16
Total %	100	100	100	100	100	100

Source: Secondary data processed (2017)

The efficient DMU on the CRS assumption every year always has a smaller percentage than the inefficient DMU. The number of efficient DMUs in 2015 and 2016 was 3, while in 2017, the efficient DMUs increased to 5 DMUs. The DMU is efficient on the assumption that the output orientation CRS means that the DMU can produce the optimal amount of output from some existing inputs.

Based on the VRS assumption, the percentage of efficient DMUs also has a smaller value than the inefficient DMUs. It can be seen in Table 11, where the percentage of efficient and inefficient DMU in 2015 was 31.25% and 68.75%. In 2016, 43.75% was an efficient DMU, and the remaining 56.25% was an inefficient DMU.

Meanwhile, in 2017 the efficient DMU had 43.75% while the DMU was inefficient at 56.25%. This percentage shows that the assumption of efficient DMU VRS increases every year, but the percentage value of inefficient DMU is always greater than that of efficient DMU.

**Inefficient DMU and its Improvement**

In addition to producing efficiency values for each DMU, efficiency calculations using the DEA method can also provide suggestions for improvements to inefficient DMUs. The target of improving this variable will be to use inefficient DMU to optimize input or output. With the target given, the inefficient DMU can improve the efficiency value to relative efficiency.

Table 12. Projected SHU Increase for Inefficient DMU (Assumption of CRS and VRS Output Orientation)

DMU	CRS			VRS		
	2015	2016	2017	2015	2016	2017
	%	%	%	%	%	%
1	22.10	50.96	481.96	22.09	50.728	476.54
2	43.98	2.02	73.65	27.50	0	47.58
3	29.62	53.70	-	15.81	51.49	-
4	-	34.26	-	-	0.001	-
6	175.99	155.22	153.53	171.31	127.98	130.68
7	285.19	480.68	603.58	0.01	0.01	0.01
8	56.10	210.58	165.47	53.06	190.16	164.53
9	98.07	6.83	187.76	65.54	-	187.72
10	244.78	984.51	837.56	82.50	597.22	667.53
11	554.65	513.40	255.17	546.93	506.33	253.66
12	12.05	-	-	-	-	-
13	517.81	636.74	294.69	373.29	481.86	-
15	223.36	257.05	299.36	160.16	203.69	189.37
16	742.74	762.33	536.23	738.96	758.38	536.07

Source: Secondary data processed (2017)

**Referring to the Values Projected improvements DEA**

Discussions regarding improvements with a projection value for inefficient DMUs are carried out with output orientation. The reason for choosing an output orientation is because looking at the inputs used in this study (number of

members, total member capital, external capital, and total costs), it will be more challenging to change the use of inputs for KUD management. Output-oriented projection value means how to increase SHU to be efficient.

Suggestions for improvement regarding the projection value are shown in Table 12. The

application of the projection value is to increase the output by the percentage projected by the DEA. The inefficient DMU in Table 12 can be efficient if it can produce the DEA's amount.

Based on CRS assumptions in 2016 and 2017, the projected value of the increase in SHU DMU 10 is very large, reaching 984.51% in 2016 and 837.56% in 2017. It shows that DMU 10 in producing SHU is very bad. In 2016, the SHU generated was only IDR 6,675,000 and in 2017, the SHU generated was only IDR 10,639,828.00. Meanwhile, DMU 4 in 2016 was inefficient even though in 2015 and 2017, DMU 4 was efficient. It happened because, in 2016, the SHU produced by DMU 4 decreased compared to the previous year, even though the amount of own capital and total costs used in 2016 had increased compared to 2015.

Based on the VRS assumption, in 2015 and 2016, DMU 16 was the DMU with the lowest pure technical efficiency value. It is also in line with the projected value of SHU in Table 12. where DMU 16 in the 2015 and 2016 period was the DMU with the largest projection value among all DMUs. The projection value of SHU DMU in 2015 was 738.96%, and in 2016 it was 758.38%. The projection value of 738.96% means that with constant input, DMU 16 must increase its SHU by 738.96% to be efficient.

Steps that can be taken to be able to increase SHU are to develop a KUD business. KUD business development patterns can be made by encouraging the role of members in providing participation for KUD. Member participation is the main thing for the KUD; member participation can provide strength to KUD business opportunities. The large participation of members will make the business run by the KUD more profitable. For member participation to be encouraged, bringing KUD business services closer to its members is necessary.

One way of bringing KUD services closer to members is by providing special offers for KUD members if they participate in the KUD business. The special offer was made so that the KUD business was more competitive than the businesses

held by other business entities. For example, in the RMU business unit, members who grind their rice at the RMU KUD unit are given a lower price than other rice milling businesses. The application of this special offer can also be applied to other business units, which in essence, is to increase the ability to compete with other business entities so that members prefer to transact in business units operated by KUD.

According to Siregar (2013), three other things that KUD's can do to seek business improvement are (1) establishing cooperation between KUD's, (2) conducting business promotions, and (3) collaborating with businesses owned by members or other communities. Cooperation between KUDs can provide information about the types of businesses that are capable of generating large profits. The main cooperation is carried out with KUD, which is reasonably large to provide more information about its strategic plans. Promotion is one of the keys for a company to sell its products. One form of promotion that can be carried out by the KUD is to collaborate with parties related to the KUD target market. Another promotion is to use advertisements that encourage people to buy products at KUD. Meanwhile, cooperating with businesses owned by society members can provide various businesses owned by the KUD to enter the broader market.

Relationship between Financial Performance (NPM) and Efficiency Level

Testing the KUD's relative efficiency level in the Madiun Regency is related to the financial performance discussion's financial performance. The purpose of looking at this relationship pattern is to see the relationship between the KUD's efficiency and the KUD's financial performance. NPM was chosen as the financial ratio correlated with the KUD's relative efficiency level in the Madiun Regency. The reason for using NPM as a variable correlated with KUD's relative efficiency level in the Madiun Regency is because NPM is the ratio that shows the best performance among other financial ratios.

Table 13. DMU Efisien dan Inefisien berdasarkan Asumsi CRS dan VRS Orientasi Input

Variable		Correlation with NPM
CRS-I	Pearson Correlation	.754**
	Sig. (2-tailed)	.000
	N	48
VRS-I	Pearson Correlation	.627**
	Sig. (2-tailed)	.000
	N	48

Variable		Correlation with NPM
CRS-O	Pearson Correlation	.754**
	Sig. (2-tailed)	.000
	N	48
VRS-O	Pearson Correlation	.647**
	Sig. (2-tailed)	.000
	N	48

Source: Secondary data processed (2017)

Based on Table 13, it can be seen that all the correlation values between NPM and the relative efficiency level of KUD have a significance value (2-tailed) that is smaller than  $\alpha = 5\%$ . It means that the correlation value obtained is significant. Sarwono (2006) states that there is a high correlation between the relative efficiency level of KUD and the financial performance of NPMs. The test results generally show that the better the efficiency, the better the financial performance. It is an important finding because it can suggest

inefficient KUDs to increase their efficiency so that financial performance also increases. Improved financial performance will make KUD healthier so that in the end, it can provide more benefits for its members.

**Factors Affecting Efficiency Level**

Factors affecting the level of efficiency were analyzed using multiple linear regression equations. After testing the classical assumptions, a regression model of the factors that influence SHU is obtained, as shown in Table 14.

Table 14. Factors-Factors Affecting the Efficiency of KUD in Madiun Regency

Variable	Sign of Hope	Coefficient	t-Count	t-sig.
Constants	+	3.214E-08***	-4.301	0.000
Board chairman's age	+	3.479***	5.420	0.000
Supervisor's chief age	-	-0.862 <sup>ns</sup>	-1.038	0.306
Manager's age	+	0.725 <sup>ns</sup>	0.908	0.370
The education level of the chairman of the committee	-	-0.007 <sup>ns</sup>	-0.015	0.988
The education level of the chief supervisor	+	0.959**	2.052	0.047
Manager's education level	-	-0.207 <sup>ns</sup>	-0.480	0.634
Board chairman's experience	+	0.013 <sup>ns</sup>	0.094	0.925
Chief supervisor's experience	+	0.391***	4.018	0.000
Manager's experience	+	0.246**	2.453	0.019
R Square				0.782
Adjusted R Square				0.731
F-Count				15.178
F-sig.				0.00000

Source: Secondary data processed (2017)

Based on the analysis in Table 14, Adjusted R Square's value is 0.731 or 73.1%. This value means that 73.1% of the variation in the dependent variable (level of the relative efficiency of KUD) can be explained by the independent variables (age of the chairman of the board, age of the chief supervisor, age of the manager, education of the chairman of the board, education of the chief supervisor, education of the manager, the experience of the chairman of the board, the chief supervisor's experience, and the manager's experience). In comparison, the remaining 36.9% is explained by other variables that are not in the model.

Based on the analysis in Table 14, the F-sig value is 0.0000 so that the independent

variables jointly and significantly affect the dependent variable. Based on the analysis in Table 14, partially, the variables that have a significant effect on the efficiency level of the KUD are the age of the head of the board, the education of the chief supervisor, the experience of the head of supervisors, and the experience of the manager.

**CONCLUSIONS**

Financial ratio analysis shows that the financial performance of KUD in Madiun Regency is still low. The variables that significantly affect the residual income are the number of members and the business's total volume. Most ( $\geq 50\%$ ) of Village Unit Cooperatives (KUD) in the Madiun

Regency are not yet efficient. Factors affecting the relative efficiency of the KUD in Madiun Regency are the head of the management's age, head of the supervisor's education and experience, and the manager's experience.

To improve its financial performance, the KUD must reduce outside capital and operate more efficiently. The use of capital itself must be more optimal, and there is a need for data collection for fixed assets that may no longer be used for sale to reduce the number of fixed assets that do not need to be included in the balance sheet. The number of members has a positive influence on increasing SHU, so there is a need for steps to increase the number of members for KUDs that still have few members. The efficiency of an inefficient KUD could be increased by optimizing member participation, forging cooperation between KUDs, conducting promotions, and cooperating with businesses owned by members or other communities. The study's findings indicate a positive effect on the relative efficiency of the KUD with the value of NPM. So one way to improve financial performance is to increase the efficiency of the KUD. In selecting administrators, supervisors, and managers at the RAT time, it is necessary to consider the chief supervisor, supervisors, and managers' age, experience, and education.

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