

Application of Linier Regression Method in Analysis of Farm Business Credit on The Welfare of Farmers in Kedung Lengkong Village, Dlangu Sub-District, Mojokerto District

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Abstract— The role of the agricultural sector can be optimized if it is supported by an integrated sustainable system and capital support. In this study the problems to be discussed are 1) Capital is a problem faced by farmers, 2) Many farmers can increase crop yields if they have sufficient capital, and 3) Without sufficient capital, farmers will not be able to increase the productivity of their crops. To overcome the problem of lack of capital, farmers borrow money from both formal and informal financial institutions, the purpose of this study is to determine the effect of the efficiency of agricultural credit distribution on the welfare of farmers in the agricultural sector. Agricultural credit plays a very important role in agricultural development: if production increases, farmers' income will also increase. In the research applying quantitative methods where the number of samples is 100 people. With a population of 187 people are farmers in KedungLengkong Village, Dlangu District, Mojokerto Regency. In the research, the analysis applied is simple regression to determine the effect of credit performance on the welfare of farmers. The results of the hypothesis testing that credit has a positive influence on happiness are worth the regression coefficient of 0.291. Farmers are helped by credit to buy fertilizers, seeds, and others according to agribusiness needs to increase profits, as a source of welfare.

Index Terms—About; Farm Business Credit, Income, Welfare

I. INTRODUCTION

Indonesia's economic structure is an agrarian country that always binds the agricultural sector, and national development (Prasetyo et al., 2021). The agricultural sector is essentially a reciprocal relationship. The main

goal of the country's development is for the national ideals to be achieved, namely the creation of a prosperous and just society, starting with improving the quality of life of the community, but most farmers are productive small farmers. They usually do not only have small agricultural land so that their agricultural industry can only support their daily needs. Indonesia is an agrarian country, where industrial and economic development is based on the agricultural sector which is the best choice due to the abundance of human resources as well as natural resources which has a long agricultural tradition, demands the development of infrastructure, technology, and industries that use agriculture, markets, and sustainable products.

Agrarian economics was born in the 1960s to provide social relations characteristic of dynamic production and reproduction. It also proposes changes in historical and contemporary agricultural formation and development.

One of the key elements in the effort to develop the agricultural sector is agricultural financing. On the other hand, banking interest rates in the agricultural sector are still very low (Adams, 2021). Banks are more inclined toward sectors other than agriculture, one of the reasons is because of the high risk in the agricultural sector and low cash flow (Putri, 2019).

Typically, smallholder farmers use agricultural credit to survive and large farmers use this credit to increase their source of income (Van Dam et al., 2018) assert that noodle farmers' income depends not only on agriculture but also on access to agricultural credit sources. Similarly, (Ngeno, 2018) and (Solano & Rooks, 2018) examined credit accessibility and socioeconomic attributes to improve farm household welfare.

Limited resources, especially capital, encourage farmers to have a loan (Susanto et al., 2022). Informal sources of finance used by farmers are collectors (Pratiwi et al., 2020). The existence of informal sources of credit is

sufficient to help farmers overcome capital shortages. However, informal lenders, i.e. traders, lend not only to make an economic profit but also indirectly force farmers to sell to them their crops, preventing them from assigning their crops to other traders who can buy at a high price (Keumala and Zainuddin, 2018). From this, it can be shown that the provision of capital from formal and informal organizations is an important factor for agricultural viability.

Some previous research results show that the accessibility to the majority of farmers is still very limited to credit sources (Chandio, 2020). Arguably the importance of the ability to provide credit to farmers is not fully supported by the existence of financial resources, especially formal institutions that are specialized for forest products with annual trees, Damanik (2020) reported that in Indragiri Hilir, Riau Province, coconut farmers have Chinese traders as informal financial access who have bought producers' products in the form of copra. To find out how farmers access available credit sources is to thoroughly investigate the various factors that influence farmers' access. In addition, the provision of additional sources of capital in the form of credit can help farmers so that their business can grow and have an impact so that income increases by increasing production so that it can prosper farmers.

From the description above, it shows that there is an attachment to the capital that is needed by farmers, the fulfillment of this capital can be done by borrowing from formal financial institutions whose criteria and prerequisites must be met by farmers. So the researcher took the research title *The Effect of Agricultural Credit on Farmer Welfare in Badung Village, Dlangu District, Mojokerto Regency* using linear regression. Linear regression was chosen because this method is very suitable to see the relationship between variables (Ray, 2019). This method has been widely applied in previous studies including predicting sales in a company (Ayuni and Fitriana, 2019) and also analyzing populations in poverty (Suhandi, 2018).

II. METHODOLOGY

This research applies quantitative methods, and the type of research is explanatory. In this study, several samples were drawn. The sample itself is part of the quantity and special characteristics of a population. If the researcher

cannot examine the entire population due to the size of the population or because the researcher has limited time, budget, and human resources, then the researcher can utilize a survival sample of the population (Ramadhan, 2020). All farmers in KedungLengkong Village, Dlangu District, Mojokerto Regency with a total of 187 respondents are the population in this study. The linearity test aims to determine the relationship between two variables (Ichsan et al., 2021). The normality test is carried out to check or know whether the distribution of population data is normal or not (Purba and Ruslan, 2020). The heteroscedasticity test is carried out to know the deviation of the classical hypothesis of heteroskedasticity, which means there is a difference in the variance of the residuals on all observations in the regression model (Satria et al., 2022). Hypothesis testing is useful for testing whether the initial research conjecture can be accepted (Canonne et al., 2020). The linear regression method was chosen to see the linear relationship between the independent variable and the dependent variable in a study (Dharma et al., 2020).

Figure 1. below is a flowchart of this research methodology.

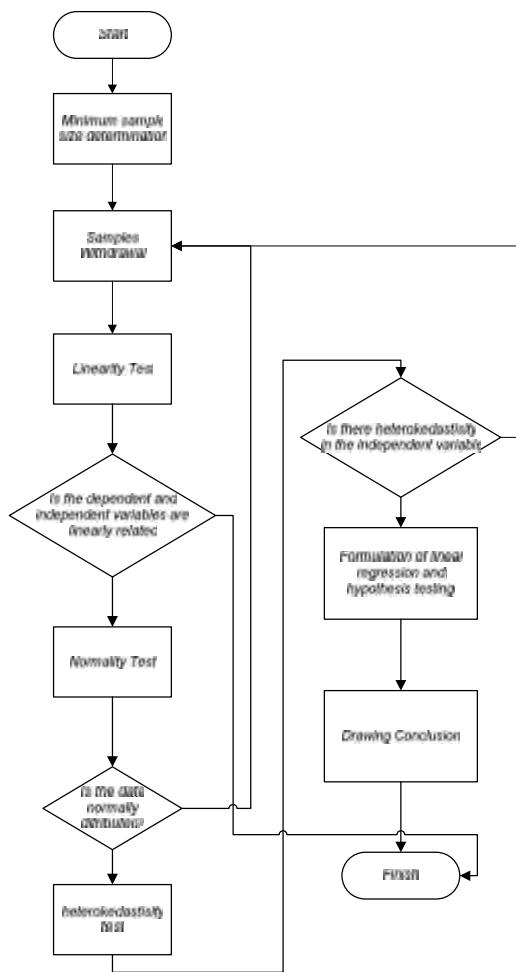


Figure 1. Research Methodology

III. RESULT AND DISCUSSION

The following are the results obtained using a Linear regression method.

A. Minimum sample size determination

$$n = \frac{N}{(1 + (N \cdot e^2))} \quad (1)$$

n= Minimum sample size
 N=Population number
 e= error

With a 10% error so that:

- n = 187 / (1 + (187 x 0,1²))
- n = 187 / (1 + (187 x 0,001))
- n = 187 / (1 + 1,87)
- n = 187 / 2,87
- n = 65,15

B. Linearity test

Table 1 below is the result of the linearity test.

Table 1
 Linearity Test Result

Depende Equatio n	n	R Squar e	Df	F	Sigf	B0	b1
X	Linear	0,604	53	80,68	0,000	14,092	2,1329

From the table above, it can be seen that all sig f values are less than 0.05. So the linearity hypothesis can be fulfilled or variable x is linearly related to Y.

C. Normality Test

The guideline for making decisions is through the Kolmogorov-Smirnov test if 0.05 is less than sig. means that the population has a normal distribution and vice versa (Ratnasari and Lestari, 2020).

Table 2
 One-Sample Kolmogorov-Smirnov Test

		Unstandardized Residual
N		55
Normal Parameters(a,b)	Mean	.0000000
	Std. Deviation	1.1173907
Most Extreme Differences	Absolute	.117
	Positive	.074
	Negative	-.117
Kolmogorov-Smirnov Z		.870
Asymp. Sig. (2-tailed)		.436

The variables have a normal distribution. This can be seen in the significant value which is below 0.05 (0.436).

D. Heterokedastisity test

The heteroskedasticity test result can be seen in Table 3 below.

Table 3
 Heterokedastisity Test

Variable	t Value	Sig t	Descript.
Farm bussines credit	0,076	0,583	There is no Heteroskedastisity

In the heteroskedasticity test on the independent variable, the p-value or sig-t result is greater than 0.05. So it can be said that there is no heteroskedasticity.

E. Regression linear formulation and Hypothesis test

Hypothesis calculation using Statistical Product and Service Solution (SPSS) software from calculations with SPSS, simple linear regression data results are presented, the summary of which can be seen in Table 4 below.

Table 4
Hypethesis Test

Variabel	Koef. Regresi (B)	t hitung	Sig. t
Constant	55,017	2,600	0,013
Farm business credit	0,679	2,554	0,014
R Square	0,291		

The linear regression equation of this study is as follows:

$$Y = 55,017 + 0,679X_1$$

From the results using SPSS software, the t-count value is 2.554. For the p-value (sig-t) has a large 0.04, then the p-value (sig-t) is less than 5% ($0.04 < 0.05$). This means that farm business credit has a significant effect on farmer welfare.

From these results, it is shown that the higher the farm credit, the better the welfare of farmers. The opposite also applies

IV. CONCLUSION

The conclusion that can be drawn from the research results is that the coefficient of determination R2 is 0.291, which means that 29.1% of changes in the dependent variable Welfare can be explained by variations in the independent variable agribusiness credit. Meanwhile, variables that are not explained in the model explain the remaining 70.9%. Therefore, this study's hypothesis that "agricultural credit affects improving farmers'

The coefficient of determination R2 has a large 0.291, which means that there is a 29.1% variation in the dependent variable Welfare that can be explained by variations in the independent variable Farm Credit factor. Variables that are not explained in the model affect the remaining 70.9%. So that the research hypothesis that explains "Farm Credit has an influence on improving Farmer Welfare" is accepted.

The Farm Credit Variable (X) has a positive effect on improving the welfare of farmers, which has a regression coefficient of 0.679. From this it is obtained that if the Farm Credit Variable increases by 1 percent, the Farmer's Welfare will increase by 0.679 percent, assuming that the other independent variables are constant. Sig. t or significance value has a large 0.014 which is lower when compared to 0.05. then the influence of the Farm Credit variable on Farmer Welfare is significant.

The constant value is 55017 which means that student learning motivation is 55017 if the learning variable is zero. This can be explained by the fact that farmers' welfare will not be achieved without agricultural credit. The agricultural credit variable (X) has a positive effect on increasing the welfare of farmers, with the regression coefficient having a magnitude of 0.679 this means that if the agricultural credit variable has increased by 1% then the welfare of farmers has also increased by a magnitude of 0.679% assuming the agricultural credit variable increases by 1% Let the other independent variables remain unchanged. The significance value (Sig.T) is 0.014, which is lower than 0.05, so the credit variable has an effect.

welfare" is accepted. This study used simple regression analysis with the intention that the impact of credit availability on farmers' welfare can be understood. The results of the hypothesis testing show that credit has a positive influence on happiness, with a regression coefficient of 0.291. Credit has an important role in increasing capital to meet the cost of production inputs so that production from producers can be increased, thus capital is very influential on optimal results, so with additional credit, input use can be increased.

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