Analysis of social economic factors affecting maize farming income in Marga Tiga district of East Lampung Regency

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Abstract. This study aims to determine the cost and income of maize farming in Marga Tiga district of East Lampung regency and to discover the influence of any social and economic factors that affect the income of maize farming in Marga Tiga district. The basic method used in this research is descriptive method. The location of research in Marga Tiga district, then it is selected a village which represents as research location by considering the highest production in Marga Tiga district. Sampling is undertaken by using simple random sampling method. The results of this study indicate that the income of farmer in Marga Tiga Distric is profitable. Factors the area of land, wage labor outside the family, the price of phonska, and land ownership significantly influence the income of maize farmers. Variable dummy land ownership that significantly indicate a difference between the ownership of the owned land own and land rent. The results of the test VPM, on land rent variable land area and the price of phonska significantly affect the income of corn farmers, while in their own land variable area of land, wage labor, and the price of phonska significantly affect the income of maize farming.

1. Introduction

Agricultural development in Indonesia is increasingly rapidly. The development of the industry in the field of agriculture is an overview of the increasing public awareness to build another farm in Indonesia. One of agricultural commodity in Indonesia, which is the amount of production is increasing is the food crop maize. In an effort to increase farmers incomes, maize will continue to play an important role in farming activity. That is, success in increasing the income of corn farmers can’t be separated from the maize itself. There are two factors that affect costs and revenues, namely internal factors and external factors. Both of these factors will together affect the costs and revenues. External factors in the form of output and input. Whereas, internal factors in the form of socio-economic factors such as age, education, knowledge, experience, skills, number of family labor, land and capital [1].

Internal factors can’t be released from the farming activity because it is one subsystem that determines the amount of output issued. The amount of output issued subsequently can affect how big is the total acceptance and the revenue to be received by corn farmers. Therefore, the need for further analysis related to the socio-economic factors affecting the farm income of maize crops in the District of Marga Tiga, East lampung Regency. This research is based on the theory of farming to determine the income of corn farmers. Researchers using the variable price of seed, land area, wage labor, experience, number of family dependants, the price of urea fertilizer, price of fertilizer phonska, education, age, and dummy variable of ownership of land own and rent.
2. Hypotheses

Socio-economic factors which includes the price of seed, land area, price of the wages of labor, experience, number of family dependants, the price of urea fertilizer, price of fertilizer phonska, education, age and the variable dummy which consist of the ownership of the owned land own and land rent affect the income of maize farming in the Marga Tiga district of East Lampung Regency.

3. Methodology

3.1. Sample and Data Collection

The location of the research was determined purposively in Marga Tiga District, East Lampung Regency, Lampung Province of Indonesia. The district of Marga Tiga is one of the district which has a production maize is quite high [2]. The primary data obtained by interview method using a questionnaires 70 maize farmers selected as respondents at random simple. The types of data collected include primary data and secondary data. SPSS is used to analyze and test the hypothesis.

3.2. Instrument Testing

The Instrument was tested with test of determination ($R^2$), test of simultaneous (F test), the test of significance of regression coefficient ($t$ test) and classic assumption test consist of normality test, multicollinearity, autocorrelation test, and heteroscedasticity test. Concurrent test (F test) and test of significance of regression coefficient ($t$ test) are said to be influential or significant as some value of alpha with a reliability of 0.05 and 0.1. Data were analyzed using multiple linear regression analysis and the Varying Parameter Model (VPM). The analysis of the VPM is used to find out more about each dependent variable socio-economic factors in maize farming. VPM is made when the coefficient of the dummy is significant, thus indicating the presence of the impact area of land use to see how influential the area of land to the income of maize farmers.

4. Results and Discussion

4.1. The Results of The Test Determination

The results of the analysis of multiple linear regression is the test of determination ($R^2$) of 0.738 or 73.8%. This suggests that the dependent variable (farmer income) value is 73.8% is explained by variants of the independent variable in the form of the price of seed, land area, price of the wages of labor, experience, number of family dependants, the price of urea fertilizer, price of fertilizer phonska, education, age. While the rest of 26.2% is explained by other variables not included in the research model. Other variables such as cost of medicines, the season, the cost of depreciation of equipment, market demand, management capabilities of farmers, etc.

4.2. The Result of The Simultaneous Test (F Test)

| Model         | Sum of Squares | Df | Mean Square | F      | Sig.  |
|---------------|---------------|----|-------------|--------|-------|
| Regression    | 17,499        | 10 | 1,750       | 16,637 | .000***|
| Residual      | 6,206         | 59 | 0,105       |        |       |
| Total         | 23,704        | 69 |             |        |       |

Source: Primary Data Analysis
Description: *** Significant at $\alpha$ 0.05

Based on the Table can be seen that the probability value is 0.000 that is smaller than $\alpha$ ($\alpha = 0.05$ and 0.1). This shows that $H_0$ is rejected and $H_1$ is accepted. It means that the variable price of seed ($X_1$), land area ($X_2$), the price of wage-labour outside ($X_3$), experience ($X_4$), number of family dependants ($X_5$), the price of urea fertilizer ($X_6$), the price of fertilizer phonska ($X_7$), education ($X_8$), Age ($X_9$) and land ownership ($D_1$) jointly affect the income of maize farmers in the District of Marga Tiga on the planting period December 2017 – February 2018.
4.3. The Result of Significance of Regression Coefficient Test (t Test)

**Table 2. Significance of Regression Coefficient Test (t Test)**

| Model          | Unstandardized Coefficient | t   | Sig  |
|----------------|----------------------------|-----|------|
| 1 (Constant)   | 14,015                     | 1,073 | .288***|
| Price of seed (X1) | .397                       | .569 | .571***|
| Land area (X2) | 1,036                     | 7,027 | .000***|
| The price of labour (X3) | .771                       | 1,755 | .085** |
| experience (X4) | .112                       | .944 | .349***|
| Number of family dependants (X5) | -.073                      | -.371 | .712***|
| Price of labour outside (X3) | .259                       | .371 | .712***|
| Price of Phonska (X7) | -1,600                   | -2,667 | .010***|
| Education (X8)  | .054                       | .738 | .464***|
| Age (X9)       | -.148                      | -.475 | .637***|
| Land Ownership (D1) | .242                      | 2,917 | .005***|

Source: Primary Data Analysis

Description: ***Significant at $\alpha = 0.05$, **Significant at $\alpha = 0.1$, ns= non significant

Based on the results of the regression analysis the value of significance (Sig.) the price of seed by 0.571 greater than $\alpha$ ($\alpha = 0.05$ and 0.1) so it is not significant. The results of regression analysis of land area ($X_2$) has a significance value of 0.000 is smaller than $\alpha$ ($\alpha = 0.05$ and 0.1) so significant. Based on the regression analysis of the price of wage-labour outside ($X_3$) has a significance value at 0.085 smaller than $\alpha$ ($\alpha = 0.05$ and 0.1) so significant. Based on the results of the regression analysis experience has a significance value of 0.349 greater than $\alpha$ ($\alpha = 0.05$ and 0.1) it is not significant. Based on the results of regression analysis of the number of dependents of the family ($X_5$) has a value of significance of 0.712 greater than $\alpha$ ($\alpha = 0.05$ and 0.1) it is not significant. Based on the results of the regression analysis of education ($X_8$) has a significance value of 0.464 greater than $\alpha$ ($\alpha = 0.05$ and 0.1) it is not significant. Based on the results of the regression analysis of age ($X_9$) has a significance value of 0.637 greater than $\alpha$ ($\alpha = 0.05$ and 0.1) it is not significant. Based on the results of regression analysis of education ($X_8$) has a significance value of 0.464 greater than $\alpha$ ($\alpha = 0.05$ and 0.1) it is not significant. Based on the results of regression analysis of age ($X_9$) has a significance value of 0.637 greater than $\alpha$ ($\alpha = 0.05$ and 0.1) it is not significant. Based on the results of regression analysis experience has a significance value of 0.349 greater than $\alpha$ ($\alpha = 0.05$ and 0.1) it is not significant. The ownership of the land ($D_1$) has a significance value of 0.005 is smaller than $\alpha$ ($\alpha = 0.05$ and 0.1) so significant. The coefficient of the dummy which are significant to the ownership of the land need to be analyzed further to determine the influence of socio-economic factors in greater detail and separate.
4.4. The Result of Varying Parameter Model (VPM)

**Table 3. Varying Parameter Model Test (VPM)**

| Variable | Land Rent | Owned Land Own |
|----------|-----------|----------------|
| Constant | 19,601    | 19,601         |
|          | (0,000)   | (0,000)        |
| Price Of Seed (X$_1$) | 3,247     | -3,222         |
|          | (0,728)   | (0,456)        |
| Land Area (X$_2$) | 1,183     | 0,791          |
|          | (0,000***)| (0,000***      |
| The Price Of Labour (X$_3$) | 0,001    | 1,326          |
|          | (0,999)   | (0,027***      |
| Experience (X$_4$) | 0,315     | -0,098         |
|          | (0,119)   | (0,460)        |
| Number of Family Dependant (X$_5$) | -0,093    | 0,038          |
|          | (0,796)   | (0,862)        |
| Price of Urea (X$_6$) | 1,111    | -0,580         |
|          | (0,230)   | (0,498)        |
| Price of Phonska (X$_7$) | -1,443    | -1,675         |
|          | (0,087**) | (0,019***      |
| Education (X$_8$) | 0,006     | 0,233          |
|          | (0,937)   | (0,129)        |
| Age (X$_9$) | -0,369    | -0,099         |
|          | (0,500)   | (0,787)        |

Source: Primary Data Analysis

Description: ***Significant at $\alpha$ 0.05 **Significant at $\alpha$ 0.1

Based on Table 3 it can be known that there are differences in the influence of socio-economic factors land area and the price of fertilizer phonska against the income of farmers with ownership of land rent, as well as there is the influence of socio-economic factors land area, the price of wage labor, and the price of fertilizer phonska against the income of farmers with ownership of their own land.

4.5. The Result of The Classical Assumption Test

**Table 4. Multicollinearity Test**

| Model | Collinearity Statistics |
|-------|-------------------------|
|       | Tolerance | VIF |
| 1     |            |     |
|       | Price of seed (X1)     | .818 | 1.222 |
|       | Land area (X$_2$)      | .457 | 2.186 |
|       | The price of labour (X$_3$) | .432 | 2.313 |
|       | experience (X$_4$)     | .421 | 2.378 |
|       | Number of family dependants (X$_5$) | .635 | 1.574 |
|       | Price of urea (X$_6$)  | .862 | 1.161 |
|       | Price of Phonska (X$_7$) | .804 | 1.243 |
|       | Education (X$_8$)      | .761 | 1.315 |
|       | Age (X$_9$)            | .394 | 2.537 |
|       | Land Ownership (D$_1$) | .874 | 1.144 |

Source: Primary Data Analysis

Based on Table 4 it can be seen that there is no variable that has value tolerance less than 0.10 and no variable that has a value of VIF greater than 10, which means socio-economic factors that affect the income of maize farmers in the District of Marga Tiga free from multicollinearity. According to Priyatno [3], If the tolerance is more than 0.1 and VIF is less than 10 then it does not occur multicollinearity.
In the table model summary can be seen that the value of Durbin-Watson is 1.499. The value of du in the table of Durbin-Watson was 1.8375, so that the known value of $4 - du$ is 2.1625. This shows no problem of autocorrelation because the value of DW is greater than du and less than $4 - du$.

![Figure 1. Heteroscedasticity Test](image)

Based on figure 1, it is known that the pattern of dots do not form a specific pattern. The dots spread out with a pattern that is not clear above and below the number 0 on the axis Y. Therefore, the socio-economic factors that affect the income of corn farmers in the District of Marga Tiga not affected by heteroscedasticity.

Normality test aims to determine whether the data distribution is normal or not. The terms in the regression analysis, namely data distribution should be normal. Testing using the Kolmogorov-Smirnov test [3].

| Unstandardized Residual |
|-------------------------|
| N                       | 70 |
| Normal Parameters       |
| Mean                    | .0000000 |
| Std. Deviation          | .29989193 |
| Most Extreme Differences|
| Absolute                | .075 |
| Positive                | .073 |
| Negative                | -.075 |
| Kolmogorov-Smirnov Z    | .624 |
| Asymp. Sig. (2-tailed)  | .831 |

Source: Primary Data Analysis

Based on Table 5 can be seen that sig. (2-tailed) is 0.831 where this value is greater than alpha ($\alpha = 0.05$) so it is not significant. This shows that $H_0$ is accepted i.e. the residuals be normally distributed. According to Ghozali [4], the t test and F test assumes a value residuals follow normal distribution, if this assumption is violated then the test statistics are not valid for the number of samples is small.

5. Discussion and conclusions
Socio-economic factors basically is one of the factors that affect income. The use of such factors has an important role in the income of maize farmers in Marga Tiga District. Based on the regression analysis, the variables jointly price of seed ($X_1$), land area ($X_2$), the price of wage labor ($X_3$), experience ($X_4$), number of family dependants ($X_5$), the price of urea fertilizer ($X_6$), the price of fertilizer Phonska ($X_7$), education ($X_8$) Age ($X_9$), and dummy variable of land ownership ($D_1$) significantly affect the income of
farmers in the District of Marga Three East Lampung Regency. This is in line with research conducted by Minai et al. [5].

But individually, each variable has different effects on the income of maize farmers. Area factor \(X_2\), labor \(X_3\), fertilizer prices \(X_7\), and dummy variable of land ownership \(D_1\) individually significantly affect the income of corn farmers. Land area for individual influential real against the income of maize farmers due to the high area of land owned then it would be increasing the number of production and can improve revenue. Significant land area is in line with previous research [5], the price of labor to be significant due to the high labor paid then it will reduce the income of maize farmers, then the efficiency of use of labor is needed. The effect of wage labor on the income of farmers in line with the research conducted by Muttakin [6] which is one of the socio-economic factors that individually significant effect on income is the cost of labor. The price of fertilizer phonska individually significantly affect the income of corn farmers, this is due to the high price of fertilizer phonska will affect the cost of the means of production and will add to the expenditure of farmers. The influence of the significance of fertilizer prices phonska supported by research Igboji et.,al [7] who stated that the fertilizer used will affect the income of a farmer.

Varying parameters model is a method to determine the relationship of output-input condition if the use of the dummy variable on the model function regression effect real Rahmawati et., al, [8]. According to Ekananda [9] the result of the difference in the slope or the slope shows the differences in the average impact of all the observation. In this study, dummy variable of land ownership with land lease and land belonging to own which significantly shows the influence of the ownership of the land against the income of maize farmers in the District of Marga Tiga. Based on the analysis of advanced VPM (Varying Parameters of the Model) there are two variables that significantly affect the income of maize farmers with ownership of the land rental variables land area \(X_2\) and the variable price of fertilizer phonska \(X_7\). While on their own land, there are three significant variables or variables that influence the income of corn farmers is the variable land area \(X_2\), the price of wage labor \(X_3\), and the price of fertilizer phonska \(X_7\).

Based on the description above can be concluded that not all socio-economic factors affecting the income of farmers in the District of Marga Tiga. It is also supported by several previous studies [5,6,7].

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