

**The Analysis of Factors That Affect The Demand of Red Chili in Blimbing
District of Malang**

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THE ANALYSIS OF FACTORS THAT AFFECT THE DEMAND OF RED CHILI IN BLIMBING DISTRICT OF MALANG

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Abstract

The aim of this research are to To analyze the factors that influence the demand of red chili partially and simultaneously and to analyze the elasticities demand of red chili.

The approach of reasearch used quantitative, with research method using multiple linier regression. While the data used are primary and secondary which taken from direct survey, related institutions, and official government website.

The result shows that partially the variables of price of red chili, price of substitution good, price of complementary good, and the number of population are not significant to the demand of red chili in Blimbing District, while the variables of spicy culinary restaurant's income and number of spicy culinary restaurant are significant to the demand of red chili in Blimbing District. Moreover, simultaneously the variables of price of red chili, price of substitution good, price of complementary good, the number of population, spicy culinary restaurant's income, and number of spicy culinary restaurant are significant to the demand of red chili in Blimbing District. Whereas the variables of spicy culinary restaurant's income have the income elasticity value as amount 0.182 and the income elasticity for the number of spicy culinary restaurant as amount 0.323.

1. Background

One of horticultural commodities is red chili. Red chili (*Capsicum annum L*) is one kind of commercial vegetables that have long been cultivated in Indonesia, because the product has a high economic value. Moreover to fulfill the needs of everyday households, chili is widely used as raw material for food and pharmaceutical industries. Although chili is not main food for Indonesian people, but the commodities cannot be abandoned. Chili, not only can be eaten freshly as a mixture seasoning, but also preserved in the form of chili sauces, pasta pickles, dried fruit and flour (Dewi, 2009).

Demand for chili being expected will continue to increase along with the increase in income and population. The increase in income and population is directly improves the people's need, so the demand of chili fluctuates in the retail market. Various supply and demand factors also cause fluctuations in the price of chili, so the equilibrium price that occurs in the condition of the amount offered is relatively much less than the amount requested. This is resulting in price which is being very high.

The rise of spicy food seller in Malang is one of high potential business fields which are very common nowadays. The number of consumer enjoying spicy foods stimulate the growth of spicy cuisine business, ranging from spicy noodles, spicy chicken, until spicy chicken claw. Those are caused by the location of Malang that is located in a highland surrounded by mountain and tends to have cold temperature, triggering spicy taste on almost every kind of food consumption. So that spicy taste which originated from chili is main commodity and seasoning for most people especially in Malang.

2. Problem Identification

From the explanation above, the problems that need to be discussed related to demand of chili in Blimbing District are:

1. What factors that cause the demand of red chili partially and simultaneously?

2. How the elasticities demand of red chili?

3. Research Purposes

1. To analyze the factors that influence the demand of red chili partially and simultaneously.
2. To analyze the elasticities demand of red chili .

4. Theoretical Framework

Theory of Demand

In the law of demand explained the nature of the relationship between the demand of goods and the price level. The law of demand is essentially a hypothesis: the lower price of an item, the more demand for these goods. Conversely, the higher price of an item, the less demand for such goods. The nature of this relationship, first due to the price increase causes the buyer looks for the other items that can be used as a substitute for the goods that the price has been increased. Conversely, if the price decrease then people will reduce purchases of other goods of the same type and adding the purchase towards the goods that the price has been decreased. Second, the increase in price causes buyers reduced real income. Revenue slump forced the buyers to decrease purchasing various types of goods, and particularly for the goods that the price has been increased (Sukirno, 2003).

Price Determination Theory

According to Tjiptono Fandy (2008) method of determination broadly grouped into four main categories method, that are demand pricing-based, costs-based, profit-based, and competition-based.

a. Demand Pricing-Based Method

This method emphasizes the factors that influence the tastes and preferences of customers rather than other factors such as cost, profit, and competition. Customer

demand itself based on various consideration, such as: The ability of customers to buy (purchase power parity); The willingness of customers to buy; The position of product in customers lifestyle, that related to whether the product as a status symbol or just a product; The benefits that given from the products to the customers; The prices of substitution products

b. Costs-Based Method

In this method the major determinant is the aspect of supply or cost, not the aspect of demand. Price is determined based on the cost of production and marketing coupled with a certain amount so as to cover the direct costs, overhead costs, and profit.

c. Profit-Based Method

This method tries to balance revenue and costs in its pricing. This work is done on the basis of target specific profit volume or expressed as a percentage toward sales and investment.

d. Competition-Based Methods

In addition based on considerations of cost, demand, or income price can also be determined on the basis of competition, which is what the competitor is doing. Competition-based pricing method consists of four kinds: the customary pricing, above, at, or below market pricing, loss leader pricing, bid pricing sealer.

Demand Elasticity Concept

Measurement that can be used to determine the relationship between the demand with the factors that influence is demand elasticity. The elasticity of demand can be divided into three (3) types, they are: Price elasticity; Income elasticity; Cross elasticity (Burhan, 2006)

a. Price Elasticity

The widest size of the elasticity used is price elasticity of demand, which measures the responsive of quantity demanded toward changes in price of the product,

by maintaining the value of all other variables in constant demand function. By using the point elasticity formula, the price elasticity of demand found as follows:

$$\varepsilon_p = \frac{\text{percentage change in quantity (Q)}}{(\text{percentage change in price (P)})}$$

(Pappas dan Mark H, 1995).

b. Income Elasticity

Income elasticity of demand measures the responsiveness of demand to changes in income, by maintaining the influence of all other variables remain constant. If (I) represent income, the income elasticity point is defined as follows:

$$\varepsilon_I = \frac{\text{Percentage Change in Quantity (Q)}}{\text{Percentage Change in Income (I)}}$$

Income and the amount of purchased is generally moving to the same direction, i.e revenue and sales directly related and not in reverse (Pappas and Mark H, 1995).

c. Cross Elasticity

The concept of cross-price elasticity is used to examine the responsiveness of demand for one product for changes in the price of other products. Cross-price elasticity of demand is known by the following:

$$\varepsilon_{px} = \frac{\text{Percentage Change in the Number of Y}}{\text{Percentage Change in the Price of X}}$$

where Y and X are two different products. Cross-price elasticity for substitutes is always positive, the price of the goods and the demand for other goods always moving to the same direction. Cross-price elasticity is negative for complementary, price and number moves to reverse direction. The last, cross-price elasticity of zero, or close to zero, for the goods that are not related, variations in the price of one good do not affect the demand for both goods (Pappas and Mark H , 1995).

5. Hypothesis

1. It is expected that the price itself (red chili price), price of big red chili, price of onion, number of population, spicy culinary restaurant's income, and the number of spicy culinary food restaurant partially influenced toward the demand of chili in Blimbing District of Malang. It is expected that the price itself (red chili price), price of big red chili, price of onion, number of population, spicy culinary restaurant's income, and the number of spicy culinary food restaurant simultaneously influenced toward the demand of chilli in Blimbing District of Malang.
2. It is expected that income has positive elasticity toward the demand of red chili.

6. Research Methodology

Research Design

According to Robert Donmoyer (Given, 2008) quantitative research method is the approaching against to empirical studies to collect, analyze, and shows the data that in the form of numerical rather than narrative.

The reason why researcher using quantitative method because the objective of quantitative method is to develop and lies mathematical models, theories, and hypothesis related to phenomena. Correlation between those variables either to test whether the result has positive or negative correlation between each others. So that the researcher can avoiding bias of the focus of research (elaboration, explanation, and forecast).

Definition of Variables

Definition of operational is a definition that is given to variable or construct by way of giving a meaning, or specifies the activities, or provide an operational necessary to construct or set these variables (Nazir, 2003). Operational definitions that used in this research are the following :

- a. Dependent Variables

Demand (Y) here are obtained from how dependent variables have the effect on independent variables.

b. Independent Variables

1. Price of Red Chili (X_1)

In previous research, price of red chili itself is the main factor that influenced demand.

2. Price of Big Red Chili as Substitution Good (X_2)

The good is called substitution toward other good if those were used as replacement.

Big red chili used as substitution good because they have the same benefit and usage. The spicy flavor of big red chili used as replacement of spicy flavor of red chili. This substitution good have identical spicy taste of red chili even though they are not 100% similar in term of hot flavor level.

3. Price of Onion as Complementary Good (X_3)

The good is called complementary toward another good if they were used together.

Onion can be called as complementary goods of red chili because they were used together as complement.

4. Number of Population (X_4)

The number of population which took in Blimbing District hold the main role facing the high demand toward chili. The higher the number of population, the higher the demand of red chili.

The number of population used as sample is the number of Blimbing District population since 2011-2014.

5. Spicy Culinary Restaurant's Income (X_5)

Spicy culinary restaurant's income is the measurement indicator of society purchase power parity in consuming spicy food. The higher spicy culinary restaurant's income, the higher purchase power parity of society toward spicy food of red chili.

The income of these restaurants taken as sample is the amount of spicy culinary restaurants which are located in Blimbing District since early 2011-2014 and has accountancy of gross income.

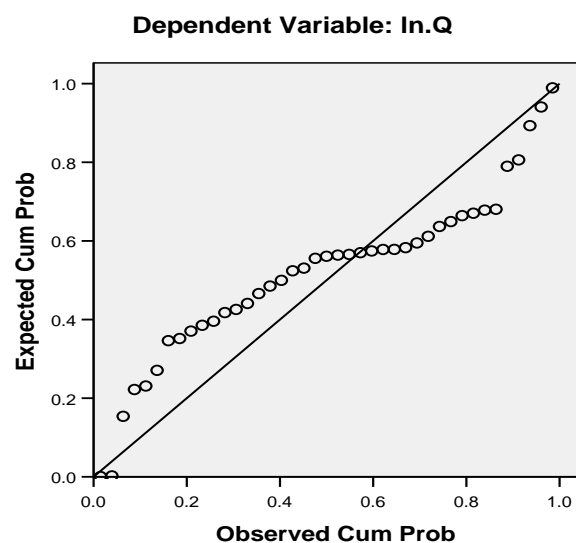
6. Number of Spicy Culinary Restaurant (X_6)

The more spicy food business grows directly have the influence toward higher demand of chili. It is required at least 5-10 kg of red chili for each spicy culinary restaurant in Blimbing District, such as spicy noodle restaurant and spicy chicken claw small stalls.

7. Results of Classical Assumptions Test

Assumption Test Results: Normality

Normal P-P Plot of Regression Standardized Residual



Source: SPSS Data processed, 2014.

Figure 7.1 Normality Assumption Test Result

The result of the analysis in Figure 4.8 shows that the line describes the data actually follows the diagonal line, so it can be concluded that the regression model obtained has a normal distribution.

Assumption Test Results: Multicollinearity

Multicollinearity occurs when the VIF value is greater than 10. Good regression model does not have multicollinearity, which has correlation between the independent variables (independent). If the VIF value is less than 5 then it does not have multicollinearity in this regression model. VIF value and tolerance value can be presented in the table below.

Table 7.2 VIF value to Multicollinearity Test

Variable	VIF value
Price of Red Chili (X_1)	3.326
Price of Substitution Good (X_2)	1.687
Price of Complementary Good (X_3)	2.635
Number of Population (X_4)	4.974
Spicy Culinary Restaurant's Income (X_5)	1.891
Number of Spicy Culinary Restaurant (X_6)	5.553

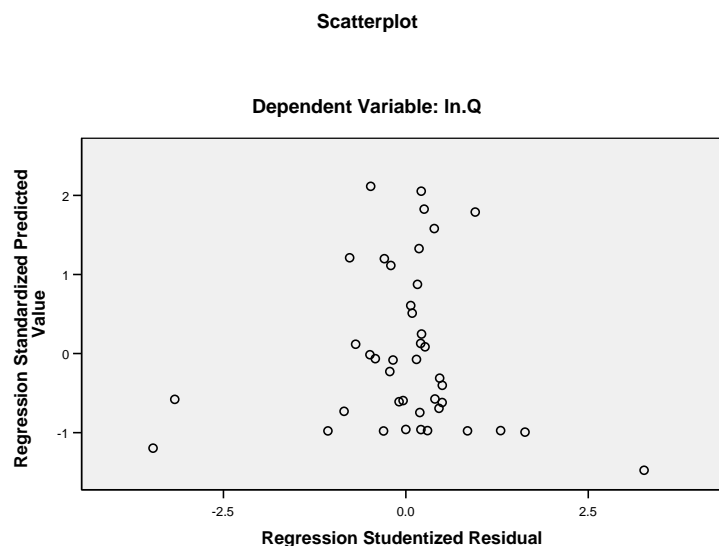
Source: SPSS Data, processed, 2014.

Result of the table shows that the VIF value is less than 10. Thus it can be concluded that the data in this study does not occur multicollinearity (non-multicollinearity).

Assumption Test Results: Autocorrelation

To test whether there is autocorrelation in the equation, if the value of DW is located between the upper limit (du) and lower limit (dl) or DW lies between (4-du) and (4-dl), then the results are inconclusive. A good regression model is regression that is free from autocorrelation. The value of DW (Durbin-Watson) as amount 1986; value du = dl = 1.8493 and 1.1891. Seen from the value of DW = 1.986 which is above the value of du = 1.8439 and less than 4-du (4-1.8493 = 2.1507), this means that the regression model is avoid from the assumption of autocorrelation.

Assumption Test Result: Heterocedasticity



Source: SPSS Data, processed, 2014.

Figure 7.3 Heterocedasticity Assumption Test Result

Good regression model does happen homocedasticity or does not happen heterocedasticity. The graph in Figure 7.3 illustrates that the graph plots between the predicted value of the dependent variable (ZPRED) with the residual (SRESID) form a specific pattern, this means that the regression model indicated the occurrence of heterocedasticity.

To avoid heteroscedasticity then doing further testing by using Park method. A good regression model does not happen heterocedasticity. This test is performed to create a model of regression between the value of absolute variance (U_i) as the dependent variable with the independent variable (Gozali, 2001). If all independent variables are statistically significant in the regression are the symptoms of heterocedasticity (Hasan, 1999), or if all the independent variables were not statistically significant in the regression model did not occur heterocedasticity. The results of the heterocedasticity test analysis by the Park method can be seen in the appendix with the following results:

Table 7.4
Heterocedasticity Assumption Test with Park Test Result

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-287.799	212.218		-1.356	.193
	ln.x1	.083	.547	.046	.152	.881
	ln.x2	-.048	.508	-.021	-.095	.925
	ln.x3	-1.512	.595	-.742	-2.540	.071
	ln.x4	26.303	17.818	.530	1.476	.158
	ln.x5	-1.056	.635	-.414	-1.662	.115
	ln.x6	-.076	.506	-.068	-.151	.882

a. Dependent Variable: Ln.U2i

Source: Data processed, 2014.

Description:

X_1 : Price of Chili

X_2 : Price of Substitution Good

X_3 : Price of Complementary Good

X₄ : Number of Population

X₅ : Spicy Culinary Restaurant's Income

X₆ : Number of Spicy Culinary Restaurant

From the table above, it appears that the probability of all independent variables is greater than 0.05 (not significant) therefore it is concluded that the regression model does not occur heterocedasticity.

Data Analysis

Results of Multiple Regression Analysis

Table 7.5 Results of Multiple Linear Regression Analysis

Variable	<i>Unstandardized Coefficients</i>	<i>Standardized Coefficients</i>
Constant	-4.976	
Price of Red Chili (X ₁)	-0.011	-0.019
Price of Substitution Good (X ₂)	-0.073	-0.104
Price of Complementary Good (X ₃)	-0.069	-0.132
Number of Population (X ₄)	0.684	0.049
Spicy Culinary Restaurant's Income (X ₅)	0.182	0.227
Number of Spicy Culinary Restaurant (X ₆)	0.323	0.930

Source: SPSS Data, processed, 2014.

Multiple linear regression model based on the results of multiple regression analysis in Table 7.5 can be structured as follows:

$$Y = -4.976 - 0.011X_1 - 0,073X_2 - 0.069X_3 + 0.0684X_4 + 0.182X_5 + 0.323X_6$$

From the regression model analysis, it is aimed to know the influence Price of Red Chili (X_1), Price of Substitution Good (X_2), Price of Complementary Good (X_3) cause the decreasing on Demand (Y). That is, if an increase in (X_1), (X_2), (X_3) then it will lead to a decrease in demand (Y). Conversely, if there is a decrease in (X_1), (X_2), and (X_3) there will be an increase on demand (Y).

For variable Number of Population (X_4), Spicy Culinary Restaurant Income (X_5), and Number of Spicy Culinary Restaurant (X_6) have a positive influence on demand (Y), means that if there is an increase on (X_4), (X_5), and (X_6) the demand (Y) will also increase. Conversely, if there is a decrease in (X_4), (X_5), and (X_6) then it will be followed by decreasing on demand (Y).

Multiple Correlation Analysis

In regression analysis result, the correlation or relationship between variables will be known. Multiple correlation analysis is used to determine the relationship between variables.

Table 7.6 Correlation Analysis Result

Dependent Variable	Independent Variables	R	<i>R square</i>
Demand (Y)	Price of Red Chili (X_1)	0.953	0.909
	Price of Substitution Good (X_2)		
	Price of Complementary Good (X_3)		
	Number of Population (X_4)		
	Spicy Culinary Restaurant's Income (X_5)		
	Number of Spicy Culinary Restaurant (X_6)		

Source: SPSS Data processed, 2014.

Description:

R : Multiple correlation coefficient

R^2 : Determination coefficient

Correlation between all independent variables on the dependent variable can be seen from coefficients R. The tight measurements are:

0 – 0.2 : Very weak

0.2 – 0.4 : Weak

0.4 – 0.6 : Quite

0.6 – 0.8 : Strong

0.8 – 1 > Very strong

Known coefficient R as amount of 0.953, which means the relationship between all the independent variables on the dependent variable are strong.

Based on the results of the calculation which presented in Table 7.6 value of R^2 obtained as amount 0.909 this means that the variable (X_1), (X_2), (X_3), Number of Population (X_4), (X_5), (X_6) simultaneously explain 90.9% variation in the magnitude of change in demand (Y), while another change in demand (Y) is influenced by other variables which is not examined in the amount of 9.1%.

8.Hypothesis Testing

As expected Price of Red Chili (X_1), Price of Substitution Good (X_2), Price of Complementary Good (X_3), Number of Population (X_4), Spicy Culinary Restaurant's IncomeS (X_5), and Number of Spicy Culinary Restaurant (X_6) simultaneously effect on Demand (Y).

To test the hypothesis the F test is used, which is to test statistically whether the independent variables simultaneously have a significant effect on the dependent variable. The F-test result are presented in the table below.

Tabel 8.1 F Test Result

Dependent Variable	Independent Variables	F calculate	F table ($\alpha=0,05$; df =34;k = 6)	Sig. F	Decision to Ho
Demand (Y)	Price of Red Chili (X_1)	56.395	2.38	0.000	Rejected
	Price of Substitution Good (X_2)				
	Price of Complementary Good (X_3)				
	Number of Population (X_4)				
	Spicy Culinary Restaurant's Income (X_5)				
	Number of Spicy Culinary Restaurant (X_6)				

Source: SPSS Data processed 2014.

From the results of statistical tests in Table 8.1, obtained the F calculate value as amount 56.395. While the value of F table with a significance level 0.05 and $df=34$ and $k=6$ as amount 2.38. Because the F calculate $>$ F table then H_0 is rejected. Thus it is concluded that simultaneously the variables (X_1), (X_2), (X_3), (X_4), and (X_6) have a significant influence on Demand (Y). Thus, as expected variables (X_1), (X_2), (X_3), (X_4), and Number of Spicy Culinary Restaurant (X_6) have the simultaneously effect on Demand (Y) is acceptable.

As expected (X_1), (X_2), (X_3), (X_4), (X_5), and (X_6) have partially effect on Demand (Y)

To prove the hypothesis on partially used T test with the following criteria:

- a. If the probability $>$ α , then H_0 is accepted and H_a is rejected. This means that each factor or independent variables did not significantly affect the dependent variable.

- b. If the probability is $\leq \alpha$, then H_0 is rejected and H_a is accepted. This means that each of the independent variables significantly affect to the dependent variable.

T test analysis results are presented in the table below:

Table 8.2 T Test Result

Dependent Variable	Independent Variables	t calculate	t table ($\alpha=0,05$; df =34;k = 6)	Sig. t	Decision to H_0
Demand (Y)	Price of Red Chili (X_1)	-0.206	1.69092	0.838	Accepted
	Price of Substitution Good (X_2)	-1.549		0.131	Accepted
	Price of Complementary Good (X_3)	-1.564		0.127	Accepted
	Number of Population (X_4)	0.428		0.672	Accepted
	Spicy Culinary Restaurant's Income (X_5)	3.184		0.003	Rejected
	Number of Spicy Culinary Restaurant (X_6)	7.616		0.000	Rejected

Source: SPSS Data processed, 2014

From the table above, it can be seen that:

From the description of results above, it was concluded that the (X_1), (X_2), (X_3), (X_4) have partially no effect on (Y), while (X_5) and (X_6) have a significant influence on (Y).

Demand Elasticity

To test the level of sensitivity of demand to price changes can be seen by looking at the regression coefficients of each independent variables. Because one of the interesting characteristics of multiple logarithmic regression models that regression coefficient b_i is the value of its elasticity. So with this model, the value of its elasticity is the regression coefficient of each independent variables, that occurred in the variables that had been studied using income elasticity.

Table 8.3

The Value Elasticity of Red Chili Demand

Variable	Income Elasticity
Spicy Culinary Restaurant's Income (X_5)	0.182
Number of Spicy Culinary Restaurant (X_6)	0.323

Source: Data processed.

From the table 8.3 known that the elasticity Income of Spicy Culinary Restaurant's income (X_5) as amount 0.182. If an increase in the Spicy Culinary Restaurant's Income (X_5) as amount 1% then it will lead to an increase in demand of chili as amount 0.182%, and conversely decreasing in Spicy Culinary Restaurant's Income (X_5) as amount 1%, it will lead to decreasing in demand of chili as amount 0.182%. If income elasticity is smaller than one and positive, it indicates that the chili is a normal good (inelastic). This means that the percentage change in income is greater than the change in demand of red chili. Or in other words, the high and the low level of income does not definitely lead the large changes in demand of chili.

The table 8.3 known the elasticity income of the Number of Spicy Culinary Restaurant (X_6) as amount 0.323. If an increase in the Number of Spicy Culinary Restaurant (X_6) as amount as 1% then it will lead to an increase in demand of red chili as amount 0.323%, and conversely decreasing the Number of Spicy Culinary Restaurant (X_6) as amount 1%, it will lead to decreasing in demand of red chili as amount 0.323%. Income elasticity is smaller than one and positive indicates that the red chili is a normal good (inelastic). This means that the percentage change in quantity of spicy restaurant is greater than the changes in demand of red chili. Or in other words, the high and the low level of the number of spicy restaurant does not definitely lead the large changes in demand of red chili.

9. Conclusion

1. From the partial analysis, concluded that :
 - a) The variable Spicy Culinary Restaurant's Income (X_5) were considered significant to the demand of red chili (Y) the need of red chili as a seasoning of food products is produce extremely large, thus requiring is about 5 kg per day to produce the products that are offered, so the high income of restaurant indicates the purchasing power of spicy food is very high, that it is very influential on demand of red chili. The higher the income of restaurant the greater the demand for red chili.
 - b) The variable Number of Spicy Culinary Restaurant (X_6) were considered significant to the demand of red chili (Y) because the increasing amount of spicy culinary restaurant will stimulate the demand of red chili.
2. Price of red chili, price of substitution good, price of complementary good, number of population, spicy culinary restaurant income, and number of spicy culinary restaurant simultaneously have significant effect on demand of red chili.

3. Spicy culinary restaurant's income which has an income elasticity as amount 0.182 and the number of spicy culinary restaurant has an income elasticity as amount 0.323. Those mean that the high or low level of both spicy culinary restaurant's income and spicy culinary restaurant in Blimbing District do not lead the large change in demand of red chili in the market.
4. There is the high cost in distribution of chili, because the farmers of chili only available outside Blimbing District and also wheather and land condition affect the implantation of chili. This supply push inflation cannot be solved with decreasing the amount of money that have been spread, but can be solved with increasing productivity and developing the sector of volatile and export goods in the local area that have prospect condition.

10. Suggestions

From the conclusions above, here is given a few suggestions that can be used as consideration:

1. Every spicy culinary business should have to control the demand of commodities (red chili, big red chili, and onion), then in running their business there would not be inflation because of the demand of commodities is high without caring to the price of commodities whether they are in high or low level.
2. Government participate to control the information of production from the local farmers. Have cooperation in order to inform the potential time of implantation is proper and prospect inside the demand of market and when is the implantation time will be fall and scarce in the demand of market.

BIBLIOGRAPHY

- Burhan, Umar. 2006. *Konsep Dasar Teori Ekonomi Mikro*. BPFE Unibraw . Malang.
- Dewi, Tria Rosana, 2009, Analisis Permintaan Cabai Merah Di Surakarta. *Minor Thesis, Faculty of Agriculture, Sebelas Maret University, Surakarta*, (online), accessed on April 1st 2014.
- Ghozali, Imam. 2001. *Aplikasi Analisis Multivariate Dengan Program SPSS 2nd edition*. Badan Penerbit Universitas Diponegoro. Semarang.
- Given, Lisa M. (editor). 2008. *The Sage Encyclopedia of Qualitative Research Methods*. Thousand Oaks: Sage.
- Nazir, M. 2003. *Metode Penelitian*. Ghalia Indonesia. Jakarta.
- Pappas, J.L dan M. Hirschey. 1995. *Ekonomi Manajerial Jilid 1*. Binarupa Aksara. Jakarta.
- Sukirno, Sadono. 2003. *Pengantar Teori Mikroekonomi 1st edition*. PT Raja Grafindo Persada. Jakarta.
- Tjiptono, Fandy. 2008. *Strategi Pemasaran 3rd edition*. Andy. Yogyakarta.