

Factors Affecting Clove Exports in North Sumatera Province

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Abstract - This study aims to analyze the effect of production, the population of the destination country, the GDP of the destination country, the distance between the Province of North Sumatera and the destination country, and the exchange rate of the export destination country in US \$ to the value of clove export in North Sumatera Province 2011-2015 based on gravity model in the countries of Singapore, Malaysia, Vietnam, United States, India, United Kingdom, and Taiwan. Data analysis method used is panel data regression analysis with Random Effect Model. The results of this study indicate that the production of cloves and Gross Domestic Product of export destination countries has a positive and significant influence, the distance between North Sumatera Province and export destination countries has a negative and significant effect on the value of clove exports in North Sumatera Province. While the number of population of export destination countries showed a positive and insignificant influence, the nominal exchange rate of export destination countries had negative and insignificant effect on clove export value in North Sumatera Province.

Keywords - Export Of Cloves; Distance; Exchange Rate; GDP.

I. INTRODUCTION

North Sumatera is one of the provinces whose area has potential for the development of clove cultivation. Some of the districts that own the largest clove plantations are Simalungun, Nias, Karo, Mandailing Natal, and Tapanuli. North Sumatera also participates in international trade activities in the export of cloves. The development of clove

exports in the Province of North Sumatera fluctuated, caused by the stock of cloves that are not continuous is always there because the cloves are seasonal commodities. In addition, it can be known also in 2014 clove export volume is greater than the production of cloves. This is due to the stock of the previous year that has not been exported.

Table 1. Area, Production, Volume and Value of Clove Export in North Sumatera Province

Year	Wide Area (Ha)	Production (Kg)	Volume (Kg)	Value (US\$)
2011	3.060	373.000	194.000	239.909
2012	2.943	374.000	318.000	1.695.145
2013	3.154	428.000	248.000	393.228
2014	3.128	462.000	597.000	1.044.216
2015	3.172	640.000	623.000	1.891.705

Source: Central Bureau of Statistics, 2017.

The main countries for which clove exports are exported are North Sumatera, Singapore, Malaysia, Vietnam, United States, India, United Kingdom and Taiwan. The export volume of cloves to export destination countries has

increased and decreased. However, clove production is increasing every year. Export destination countries have different locations and characteristics both in terms of population size, economic size and distance from each other.

This variation of characteristic will affect trade between North Sumatera Province and clove export destination country.

The aim of this research is to analyze the influence of clove production, the population of export destination country, the gross domestic product of export destination country, the distance between North Sumatera Province with the export destination country, and the exchange rate of export destination country in US \$ to clove export in North Sumatera Province .

II. RESEARCH METHODS

The method used is panel data regression analysis using natural logarithm model. This research will analyze the value and significance of clove production influence, the population of export destination country, Gross Domestic Product of export destination country, distance between North Sumatera Province and export destination country in US \$ to clove export value in Sumatera Province North. The model that will be used in this research are:

$$\text{LnNE}_i^t = \beta_0 + \beta_1 \text{LnPROD}_i^t + \beta_2 \text{LnJP}_j^t + \beta_3 \text{LnGDP}_j^t + \beta_4 \text{LnDIST}_j^t + \beta_5 \text{LnER}_j^t + \mu$$

Where :

- β_0 = Intercept
- $\beta_1, \dots, \beta_5$ = Slope of each variable
- t = Year 2011-2015
- j = The main export destination country in North Sumatera Province
- i = North Sumatra Province

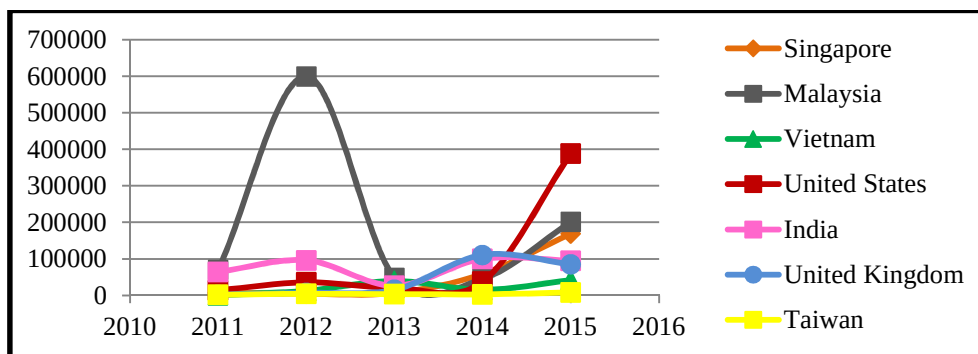
- LnNE_i^t = Value of clove export in North Sumatera Province (US \$)
- LnPROD_i^t = Clove production in Sumatera Province Utrara-i in year-t
- LnJP_j^t = The population of export destination j-j in year-t (soul)
- LnGDP_j^t = GDP export destination -j against year-t (US \$)
- LnDIST_j^t = Distance between North Sumatera Province and export destination country j at year t (km)
- LnER_j^t = Exchange rate of export destination country-j in year-t (US \$) μ = Error term

There are several methods commonly used in estimating regression models with panel data, ie Command Effect Model, Fixed Effect Model, and Random Effect Model. To know the model used, can be tested Chow and Hausman test.

III. RESULTS AND DISCUSSION

A. Value of Clove Export in North Sumatera Province

In the province of North Sumatra, clove exports also provide state revenues through foreign exchange even though in a small amount. The value of Indonesian rubber exports to destination countries is different in each country. Clove export destination countries in North Sumatera Province consist of countries of Singapore, Malaysia, Vietnam, United States, India, United Kingdom, and Taiwan expressed in US \$ year 2011-2015.



Picture 1. Value of Clove Export in North Sumatera Province

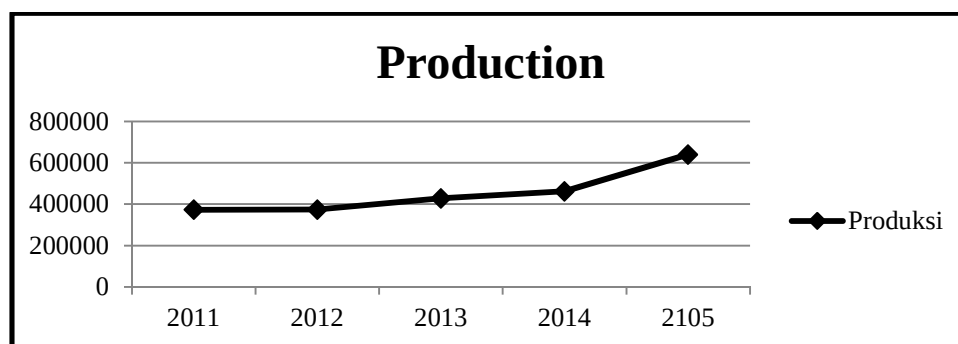
Pursuant to Country of Destination Year 2011-2015

Picture 1. shows the value of clove exports in North Sumatera Province in 2015 where Malaysia is the highest value of US \$ 169,030 and the lowest is Taiwan state which is only US \$ 8,207.

B. Clove Production in North Sumatera Province

According to Khusaini (2013) explain generally defines production as input transformation (purchased goods) into output (goods sold). Production is a process or activity that

involves inputs to be processed and then will create output as a result of the process.



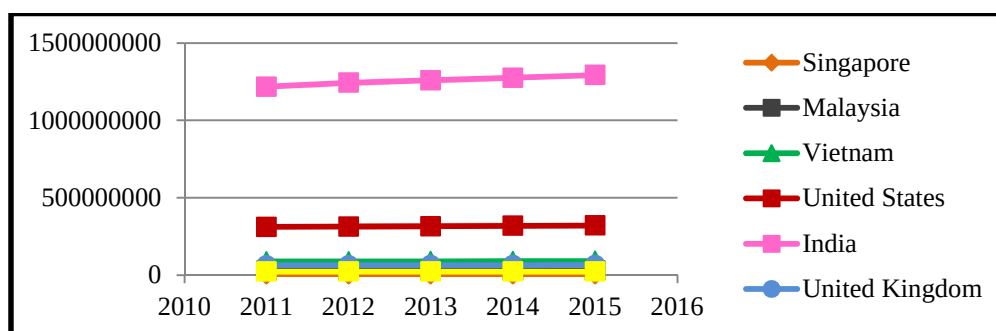
Picture 2. Clove Production in North Sumatera Province Year 2011-2015

Based on Picture 2 the production of cloves in 2011 to 2015 has increased due to the increasing area. Although in 2012 had decreased the area of clove plantation, this does not make the production of cloves decreased.

Total Population of Clove Export Destination in North Sumatera Province

The number of residents of the destination country represents the amount of demand for clove exports from the Province of North Sumatera to the destination country. The

increase in population will increase demand for export commodities from importing countries that can make the value and quantity of commodities to be traded between the two countries getting bigger. This can occur due to the increasing demand for clove raw material needs to be processed into various products for the needs of the population itself, as well as reprocessed into other forms.

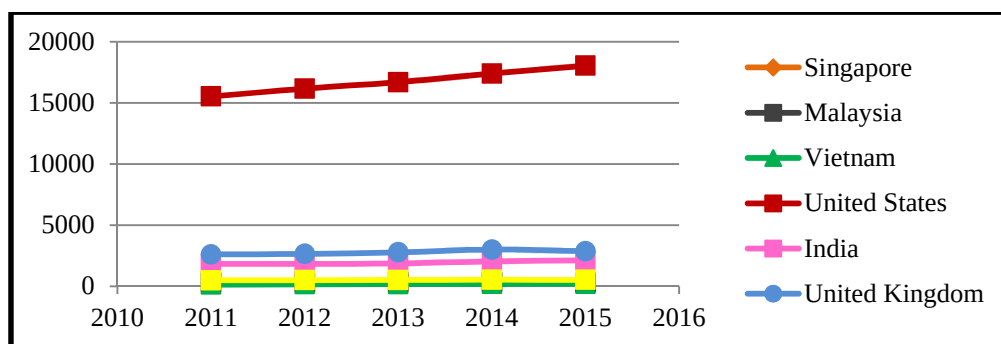


Picture 3. Number of Climate Export Destination Countries in North Sumatera Province Year 2011-2015

Based on Picture 4.3 it can be seen that by 2015 the largest population is India with 1,292,707,000 million people, while the lowest is Singapore with population of 5,535,002 million people.

C. Gross Domestic Product (GDP) of Clove Export Destination in North Sumatera Province

Gross Domestic Product (GDP) of exporter and importer countries has a positive relationship with bilateral trade. GDP from exporting countries measures the country's production capacity.



Picture 4. Gross Domestic Product (GDP) Export Destination Country Clove in North Sumatera Province Year 2011-2015

Picture 4 shows that in 2015 among the seven countries, United States is the country with the highest GDP of US \$ 18 trillion, while the country with the lowest GDP is the state of Vietnam which is US \$ 193 billion. This may indicate that if the GDP of the clove export destination country is large, then there is a tendency for the country to increase the demand for cloves in North Sumatera Province.

D. Distance between North Sumatera Province and Clove Export Destination Country in North Sumatera Province

Distance is a variable that will increase export costs. If the distance farther, there is a possibility that the cost required for transportation will increase. The geographical distance between North Sumatera Province and the main clove export destination country in North Sumatera Province, namely Singapore, Malaysia, Vietnam, United States, India, United Kingdom and Taiwan can be seen in the table below.

Table 2. Distance Between North Sumatera Province and Country of Destination

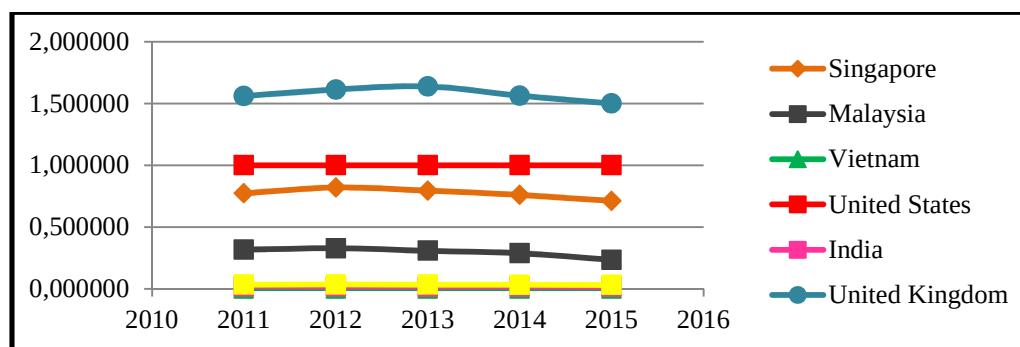
Export of Cloves in North Sumatera Province		
No	Country	Distance (Km)
1	Singapore	483
2	Malaysia	357
3	Vietnam	1.640
4	United States	15.397
5	India	3,037
6	United Kingdom	10.639
7	Taiwan	3.331

Source: Distancefromto.net, 2017

From Table 2 it can be seen that the distance of the export destination of clove exports in the Province of North Sumatera to the countries of Singapore, Malaysia, Vietnam, United States, India, United Kingdom, and Taiwan. United States is the furthest country as the recipient of clove export in North Sumatera Province compared to six other countries which amounted to 15,397 Km.

E. Nominal Exchange Rate of Clove Export Destination in North Sumatera Province

The exchange rate of a country's currency against another country is taken into consideration to measure the value of the purchase of goods to be removed from abroad. Therefore, the exchange rate of US \$ to the countries of Singapore, Malaysia, Vietnam, United States, India, United Kingdom and Taiwan which is the export destination of cloves will affect the value of clove exports in North Sumatera province because the price of cloves traded using US units \$ from 2011 to 2015.



Picture 5. Nominal Exchange Rates of Clove Export Destination Countries in North Sumatera Province Year 2011-2015

Picture 5 shows that the nominal exchange rates of the countries of Singapore, Malaysia, Vietnam, United States, India, United Kingdom and Taiwan fluctuate from 2011 to 2015. By 2015, the highest nominal exchange rate is the United States nominal exchange rate of US \$ 1 , 500192 and Vietnam's lowest nominal exchange rate of US \$ 0,000044.

F. Panel Data Regression Analysis

Estimation of clove export value gravity in North Sumatera Province from seven export destination countries

is done by using E-Views 8.0 program and panel data method. The process of estimation of panel data method in this research is done by three model that is Common Effect Model, Fixed Effect Model, and Random Effect Model. In determining the model performed Chow Test is performed to choose between Common Effect Model or Fixed Effect Model and Hausman Test is performed to choose between Common Effect Model or Fixed Effect Model.

Table 3. Chow Test and Hausman Test

Chow Test			
Effects Test	Statistic	d.f.	Prob.
Cross-section F	1,608422	(6,23)	0,1899
Cross-section Chi-square	12,262843	6	0,0564
Hausman Test			
Summary Test	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	6,474006	4	0,1664

Based on Table 3 on Chow test shows the value of probability value is greater than the level of significance of 0.1 (0.0564 < 0.10). This means that the model used is Fixed Effect Model. If the Chow Test is known that the model used is the Fixed Effect Model. In Hausman test the

probability value is greater than the significance level of 0.1 (0.1664 > 0.10). This means that the model used is the Random Effect Model. Thus, it can be concluded that this research can use Random Effect Model.

Table 4. Individual Effects on Clove Export Destination Countries

in North Sumatera Province	
Country	Constanta
Singapore	- 32,7046
Malaysia	- 32,6912
Vietnam	- 32,6950
United States	- 32,6989
India	- 32,7017
United Kingdom	- 32,6909
Taiwan	- 32,6987

From Table 4 the value of the largest value of clove exports is Singapore - 32.7046 and the smallest clove export value is United Kingdom - 32,6909 with the condition of clove production in North Sumatera Province, population of export destination country, GDP of export destination country, distance between countries, exchange rate of US \$ export destination countries shall be considered constant or equal for each export destination country. Random Effect Model (REM) in this study means that the error term each country has a negative effect if there are other factors than that examined in this study. This means that if other factors will reduce the value of clove exports in North Sumatra Province.

G. Factors Affecting Clove Exports in North Sumatra Province

In regression equation for clove export value variable of North Sumatera to country of Singapore, Malaysia,

Vietnam, United States, India, United Kingdom, and Taiwan got R-squared value equal to 65,5%. This value indicates that 65.5% change in dependent variable can be explained by independent variable, while the rest is 34,5% explained by other factor outside model.

The probability value of F statistic is smaller than the significance level of 0.1 ($0.00 < 0.1$). Thus, it can be concluded that simultaneously clove production variables, population of export destination country, Gross Domestic Product (GDP) of export destination country, distance between Province of North Sumatera with export destination country, and exchange rate of export destination country in US \$ have real effect to value of clove export in North Sumatera Province.

Table 5. Estimation of Factors Affecting Clove Exports in North Sumatra Province

Variable	Coefficient	Prob.
ConstantS	-32,69729	0,0099
Production	3,27274	0,0005
Total Population	0,18906	0,4999
Gross Domestic Product	1,54456	0,0277
Distance	-1,85027	0,0005
Exchangerate	-0,16536	0,3454
R-squared = 0,655	Prob (F-stat) = 0,00	

H. Clove Production

Clove production variables in North Sumatera Province showed a significant positive effect on clove export value in North Sumatera Province. The amount of production and export volume has a direct and significant relationship, as more production is done, the export volume also increases.

This is in accordance with Zuhri (2015) research, which says that clove production variables have a positive and significant influence on the export volume of clove of Central Java, which means any increase in production; it will increase the export of clove of Central Java. So is Segarani's (2015) study, which says that with increasing production it will be able to meet domestic demand and some of the production can be exported.

I. Number of Export Destination Countries

The variable of number of population of export destination country shows an insignificant positive influence on clove export value in North Sumatera Province. The large population of a country in a country does not have a

significant effect on the value of clove exports in North Sumatera Province. This may be due to the fact that the population of the export destination country further improves the export performance rather than the value of imports to increase the economic growth in their respective countries. Cloves exported to countries of Singapore, Malaysia, Vietnam, United States, India, United Kingdom, and Taiwan are not directly consumed by the people in those countries and the exported cloves are not used intensively by the community. It may also cause the population of clove export destination countries to have an insignificant effect.

This is in accordance with Sitorus (2009) study which states that the population of export destination countries does not affect export volume. An increase in the number of residents in an importer on the supply side will increase the production within the country in terms of quantity as well as the diversification of products of the importing country. This condition will be able to reduce the demand of export commodities by importer countries. Similarly, Soraya research (2015) which states that the population of a large country in a country does not show a significant influence.

This may be due to the fact that the population of the export destination country further improves the export performance rather than the value of imports to increase the economic growth in their respective countries. The number of population of importing countries shows the great potential of the export goods market from exporting countries. The greater the country's population the higher the country's ability to trade with other countries, especially the ability to finance its imports (Telaumbanua, 2012).

J. GDP of Export Destination Countries

Gross Domestic Product of export destination country has positive and significant influence to export value of clove in North Sumatera Province. Gross domestic product of a positive and influential destination country can explain that if the destination country's domestic product is increasing, the value of clove export in North Sumatera Province to that country can be improved.

This is in accordance with the research of Mane (2015) and Syachbudy (2017) which states that GDP of destination countries has a positive and significant effect.

According to Pradipta (2014), the increase in GDP of destination countries shows a better level of prosperity of a country because of the income of the country's population has increased so it will increase the overall consumption. Wahyudi (2015) said that if the GDP grows higher, the higher the capacity to trade with other countries, especially to finance imports.

K. Distance Between North Sumatra Province and Export Destination Countries

The distance variables significantly and negatively affect the value of clove exports in North Sumatra Province. The longer distances will tend to decrease the value of clove exports in North Sumatra Province. The distances that have a negative and significant effect can be caused by the distance is part of the transportation costs that can cause negative effects that can ultimately decrease the value of clove exports in the Province of North Sumatra. This is due to the increased cost required in export activities such as longer time, higher risk of damage to goods, and the cost of transportation. In addition, due to the time lost during the delivery of goods and also can occur due to the export of clove exports damaged during travel that can be caused by weather or mismanagement.

This is in accordance with research Kanaya (2014) and Muharami (2017) which states that the economic distance has a negative and significant effect. In contrast to Khairunisa's (2017) study which states that the insignificant

effect of economic distances is thought to be due to increasingly sophisticated and modern means of transportation, as well as high trade revenues making economic distance not a problem.

L. Exchange Rate of Export Destination Country in US \$

The exchange rate variable of the export destination country in US \$ indicates an insignificant negative effect. The effect of exchange rate can be seen through comparison of exchange rate between countries to US Dollar and total export volume to export destination countries. Sitorus study (2009), indicating that the exchange rate variable is not significant. The higher the exchange rate of the exporting country to the importing country there will be an increase in demand from the importing country. The non-significant exchange rate variable is due to the very small exchange rate effect on trade. This is not in accordance with Kusuma (2015) and Ningsih (2016) research which states the nominal exchange rate has a positive and significant effect.

IV. CONCLUSION

The conclusion of this research is clove production and Gross Domestic Product (GDP) of export destination countries have positive and significant influence. The distance between North Sumatra Province with export destination country has a negative and significant effect. While the population of the clove export destination countries shows a positive and insignificant influence, the exchange rate of the export destination country in US \$ clove export destination has negative and insignificant effect on clove export value in North Sumatera Province.

REFERENCE

- [1] Badan Pusat Statistik. 2017. Sumatera Utara, Medan.
- [2] Kanaya, Irgandhini Agra dan Firdaus, Muhammad. 2014. Daya Saing dan Permintaan Ekspor Produk Biofarmaka Indonesia di Negera Tujuan Utama Periode 2003-2012. *Jurnal Manajemen dan Agribisnis*. 11(3).
- [3] Khairunisa, Gisa Rachma dan Novianti, Tanti. 2017. Daya Saing Minyak Sawit dan Dampak *Renewable Energy Directive* (RED) Uni Eropa Terhadap Ekspor Indonesia di Pasar Eropa. *Jurnal Agribisnis Indonesia*. 5(2).
- [4] Khusaini, Muhammad. 2013. *Ekonomi Mikro: Dasar-Dasar Teori*. Cetakan Pertama. Malang (ID): UB Press.

- [5] Kusuma, Rahma Linda dan Firdaus, Muhammad. 2015. Daya Saing dan Faktor yang Mempengaruhi Volume Ekspor Sayuran Indonesia Terhadap Negara Tujuan Utama. *Jurnal Manajemen dan Agribisnis*. 12(3).
- [6] Mane, Rusdin. 2015. Analisis Harga dan Nilai Tukar Rupiah Mempengaruhi Ekspor Cengkeh Indonesia. *Akmen Jurnal Ilmiah*. 12(1).
- [7] Muharami, Ghufrani dan Novianti, Tanti. 2017. Analisis Kinerja Ekspor Komoditas Karet Indonesia ke Amerika Latin. *Jurnal Agribisnis Indonesia*. 5(2).
- [8] Ningsih, Gumoyo Mumpuni. 2016. Indonesia Clove Growth ang Affecting Factors of Indonesian Clove Exports In The International Market. *International Journal of Agriculture Innovation and Research*. 4(4).
- [9] Pradipta, Amalia dan Firdaus, Muhammad. 2014. Posisi Daya Saing dan Faktor-Faktor yang Mempengaruhi Ekspor Buah-Buahan Indonesia. *Jurnal Manajemen dan Agribisnis*. 11(2).
- [10] Segarani, Luh Putu Manik. 2015. Pengaruh Luas Lahan, Jumlah Produksi, dan Kurs Dollar Pada Ekspor Cengkeh di Indonesia. *Jurnal Ekonomi Pembangunan*. 4(4).
- [11] Sitorus, Maria. 2009. Peningkatan Ekspor CPO dan Kakao di Bawah Pengaruh Liberalisasi Perdagangan (Suatu Pendekatan Model Gravitasi). [Skripsi]. Bogor. (ID): Institut Pertanian Bogor.
- [12] Soraya, Baida. 2015. Analisis Determinan Ekspor Karet Indonesia Dengan Pendekatan Gravity Model. [Skripsi]. Medan. (ID): Universitas Sumatera Utara.
- [13] Supriana, Tavi. 2011. Indonesian Trade Under China Free Trade Area. *Economic Journal of Emerging Market*. 3(2).
- [14] Supriana, Tavi. 2013. Prospect of Indonesia Black and White Peppers Export. *Economic Journal of Emerging Market*. 5(1).
- [15] Syachbudy, Qiki Qilang, Firdaus, Muhammad, dan Daryanto, K. S. 2017. Analisis Faktor-Faktor Ekspor Produk Pertanian Indonesia ke Negara Kurang Berkembang. *Jurnal Agribisnis Indonesia*. 5(1).
- [16] Telaumbanua, Efori. 2012. Analisis Determinan Ekspor Provinsi Sumatera Utara: Pendekatan Gravity Model. *Quantitative Economics Journal*. 2(2).
- [17] Wahyudi, Setyo Tri. 2015. The Gravity Model of Bilateral Trade. *International Journal of Social and Local Economic Governance*. 1(2).
- [18] Zuhri, Muhammad H. Haqqi. 2015. Analisis Pengaruh Luas Kebun, Produksi, dan Harga Ekspor Cengkeh Terhadap Volume Ekspor Cengkeh Jawa Tengah. *Journal of Business Studies*. 2(2).