ANALYSIS OF FACTORS AFFECTING ESSENTIALS OIL EXPORT TO UNITED STATES IN CENTRAL JAVA PROVINCE, 1990-2019

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ARTICLE INFO	ABSTRACT
	This study aims to determine the factors that influence essential oil exports to the United States from Central Java Province. The independent variables contained in this study are the export price of essential oil in Central Java Province, the exchange rate, the GDP importing country (U.S.). In contrast, the dependent variable is the volume of essential oil exports in Central Java Province. This type of research is a descriptive study with a quantitative approach. The data used in this study are annual time series data from 1990-2019 with 30 data. This research is conduct through the official website to obtain research data, including the Central Bureau of Statistics, the Ministry of Trade of Indonesia, Bank Indonesia, and various other sources. Data analysis in this study using multiple linear regression analysis. In the simultaneous test results (F-test), the variable export price of essential oil in Central Java Province, exchange rate, GDP Importing Country (U.S.) simultaneously has a significant effect on the volume of essential oil exports in Central Java Province. In the partial test results (t-test), the variable GDP importing country (U.S.) partially affects the dependent variable. Meanwhile, the export price of essential oil in Central Java province and variable the partial test of the exchange rate has no significant impact on the dependent variable.

INTRODUCTION

International trade is an activity to trade various outputs in the form of goods and services produced by a country to be sold abroad and bring goods and services from abroad to be imported to that country to meet domestic needs. Activities to sell goods abroad are commonly called export activities, while moves to bring goods from abroad are called import activities. If exports are more significant than imports, it will cause a surplus in the trade balance, but if imports are more significant than exports, it will cause a deficit in the trade balance (Razak & Jaya, 2014).

International trade is necessary for every country. At this time, there is no single country in a state of autocracy or an isolated government without economic relations with other countries. It is because no country can meet its needs independently. The occurrence of international trade is base on the differences in resources owned by each region or country. As an illustration, when a government wants to produce a good, creating that good is more expensive when compared to buying the item from another country. So, these countries will prefer to buy them from other countries (Sarwono & Pratama, 2014).

Indonesia is an agricultural country blessed with abundant natural wealth. This tremendous natural wealth can be in large areas, superior varieties, and a good climate for growing crops. Various types of natural products thrive in Indonesia, some of which are cloves (eugenia aromatica), vetiver (vetivera zizonioides), patchouli (pogostemon cablin), fragrant lemongrass (cymbopogon nardus), and nutmeg (myristica fragans). This commodity has a high economic value because it is a plant that produces essential oils where the world market is looking for it (Sarwono & Pratama, 2014)

Indonesia has widely known as the center of world spices. One of the products is an essential oil, one of Indonesia's non-oil and gas export commodities. Indonesia's essential oil exports to the world fluctuate every year. Based on data from the International Trade Center (ITC) for 2014-2018, Indonesia dominates the world's essential oil market. Essential oil is one of the potential agro-industrial export commodities that can become a mainstay for Indonesia in earning foreign exchange.

Central Java Province is one of the leading production centers for Indonesia's essential oil exports. Central Java Province produces the most various essential oils among other essential oil production centers in Indonesia. The essential oils produced and exported by the Province of Central Java are patchouli oil, clove oil, fragrant lemongrass oil, nutmeg oil, and Cananga oil. Essential oils are also one of the primary export commodities of Central Java Province (Fitria, 2012).

Essential oils have volatile or volatile properties that smell delicious, are found in many plants, and smell the same as the original plants. Essential oils come from spices or herbs. Derivatives from spices or herbs are the main constituent compounds of these spices or herbs. Usually, the constituent compounds of spices taken as essential oils are the dominant compounds that determine these spices' or herbs' characteristics. The aroma of spices or herbs is determined by compounds that evaporate, extract into essential oils or oleoresins. The average essential oil content of the spices is 2%. Essential oils come from herbs consisting of hydrocarbons (terpenes, sesquiterpene, sesquiterpene, and terpenes). It also consists and hydrogenated alcohol (esters, aldehydes, ether, and ketones). Examples of essential oils used to flavor food are lemongrass oil (citronella), almond oil, and clove oil. Essential oil needs to be studied and developed as a potential commodity because several countries need it. In fact, of the 150 types of essential oils traded internationally, 40 of them are produced in Indonesia (Anto, 2019).

Price according to (Fadhlurrohman 2018), price is money billed for a product or service or the number of value consumers exchange to benefit from owning or using a product and service. The price depends solely on the company (producer) policy but ignores various aspects. The low or high price of a product depends on the product's specifications and advantages, which are very relative. In general, prices can affect the number of goods and services that consumers will consume. When a product or service price increases, consumers will purchase less of the goods or services, and vice versa. International prices are prices that occur in the global market. This international price can affect the demand for a good or service in the domestic market. If the domestic price is higher than the international price, then exports will

automatically experience a decline. On the other hand, if the domestic price is lower than the international price, the export will automatically increase.

The exchange rate is the number of currency units submitted to obtain one foreign currency unit. Foreign exchange rates show the price or value of a country's currency expressed in terms of another country's currency. The basics of forex trading state that exchanging one currency for another is called foreign exchange (forex). When exchanged for another currency, the foreign exchange rate generally means the foreign currency price. In simple terms, the foreign currency exchange rate is the value ratio between foreign currencies or foreign exchange. It means that the exchange rate shows the value ratio between two different currencies. The exchange rate is the value of a currency in exchange for another currency. It means that a currency's value is determined by the exchange rate of that currency against other currencies. The exchange rate is the price of a country's currency expressed in another country's currency (Septiana, 2016).

Gross domestic product is the market value of all final goods and services produced by a country in its economy during a specific period. This gross domestic product is one of the indicators often used by economists to measure success in a country carrying out its economic activities (Fadhlurrohman, 2018). An increase in national income is expected to increase per capita income because per capita income divides national income by the total population. Per capita income will increase if the increase in national income is more significant than the increase in population. If the opposite happens, then the country's per capita income will decrease. It means that the prosperity of the people of that country will fall because per capita income is the average income of a country's population for one year (Sattar & Wijayanti, 2018).

Research conducted by Tyanma Maygirtasari, Edy Yulianto, and Mukhamamad Kholid Mawardi in 2015 (Maygirtasari, 2015) on the analysis of factors affecting the export volume of Indonesian Crude Palm Oil (CPO) in 2009-2013 and using four independent variables, namely: Domestic CPO Production, Domestic CPO Prices, International CPO Prices, and Exchange Rate. This research is secondary data analysis in the form of time-series data from 2009-2013. The analytical tool used is multiple linear regression models. The test used is a statistical test which includes: t-test, F test, and R2. They show that the variables of Domestic CPO Production, Domestic CPO Prices, International CPO Prices, and the Rupiah Exchange Rate against the U.S. Dollar have a combined effect on the Export Volume of Indonesian CPO. Concluded from the F Test, it is obtained a significant value of 0.00 or less than the significant level. Hinted (0.000 <0.05). The data analysis results show a significant positive effect of Domestic CPO Production on Indonesia's CPO Export Volume. This positive influence can be said that if the Domestic CPO Production increases, the Indonesian CPO Export Volume will also increase. Based on the results of the t-test, the hypothesis, which states that there is a significant effect between Domestic CPO Production on Indonesia's CPO Export Volume, is partially acceptable.

Moreover, it is known that there is a significant negative effect of domestic CPO prices on the export volume of Indonesian CPO. This negative influence can be said that if the Domestic CPO Price increases, the Indonesian CPO Export Volume will decline. Based on the results of data analysis, it is known that there is an insignificant positive effect of International CPO Prices on Indonesia's CPO Export Volume. This positive influence can be said that if the International CPO Price increases, the Indonesian CPO Export Volume will also increase. Based on the results of the t-test, the hypothesis, which states that there is a significant effect between the International CPO Prices on the Export Volume of Indonesian CPO, is partially rejected. It is because Domestic CPO Prices more influence Indonesia's CPO Export Volume. Based on the results of data analysis, it is known that there is a significant positive effect of the Rupiah Exchange Rate on the Export Volume of Indonesian CPO. This positive effect can be said that

exports will also increase if there is an increase in the Rupiah Exchange Rate against the U.S. Dollar (appreciation). Based on the t-test results, the hypothesis that there is a significant effect between the Rupiah Exchange Rate against the U.S. Dollar on the Export Volume of Indonesian CPO is partially accepted.

Ratana, Azam A, Andati (Ekonomi & Keuangan, 2012), in their study entitled The Impact of Changes in Currency Exchange Rates on Indonesian Exports found, three things. They are discussed, including the impact of exchange rate changes on the volume of aggregate exports and commodities of Indonesian CPO, coal, and rubber. Important factor to see the safety factor in consumer demand (Siswanto, DJ, 2019). Several factors affect the export of Indonesian CPO, rubber, and coal. The response of Indonesian exporters to variable shocks that influence it. Data analysis methods used were VAR/ VECM, impulse-response function, and fixed effects vector decomposition. The result of this research is that currency has a causal relationship with the production index and relative prices. Meanwhile, based on VECM analysis, the aggregate exchange rate model does not significantly affect exports, both in the long and short term. The variable that affects CPO exports in the short term is the export itself. In the long run, there is a positive relationship between export volume and rupiah depreciation and a negative relationship between export volume and relative prices.

Daulika et al., (2020) said about export competitiveness and factors affecting Indonesia's natural rubber export price. This research analyzes two topics: the factors that influence the price of Indonesian natural rubber exports and Indonesia's rubber competitiveness in comparative and international competitive advantages. This research using time series data is from 1995 to 2017. Data were analyzed using multiple linear regression to influence the price of Indonesian natural rubber export while analyzing Indonesian natural rubber's position competitiveness. The study using a revealed comparative advantage (RCA) and competitive advantage by using the Trade Specialization Index approach (TSI). The factors that significantly affect Indonesia's natural rubber export are international rubber price, exchange rate, and domestic consumption. Based on competitiveness analysis, Revealed Comparative Advantage (RCA) indicates that the competitiveness of Indonesia's natural rubber exports on the international market has a comparative advantage seen from 1995-2017 with an average value of RCA> 1, which is equal to 1.01.

Based on the problems and facts obtained above, the authors are interested in researching the extent of the factors affecting essential oil export in Central Java Province with the title "Analysis of Factors Affecting Essentials Oil Export to United States in Central Java Province, 1990-2019". Following the problems stated above, this study aims to: First, to know the effect of the variable exports price on the growth rate of essential oil exports to the U.S. in Central Java Province. Second, to know the effect of the exchange rate variable on the growth rate of essential oil exports to the U.S. in Central Java Province. Third, to know the influence of the GDP export destination country (U.S.) on the growth rate of essential oil exports to the U.S.

HYPOTHESIS

The export price of Central Java essential oil is used in this study because if the price increases, it will increase the amount of supply in the law of supply. According to (Hia et al., 2013), export prices and GDP importing countries influence exports.

H1: Export prices have a negative impact on essential oil exports to the U.S. in Central Java Province.

According to Munandar (2012) foreign trade cannot be separated from exchange rate problems. The exchange rate has an impact on the exports and imports of a region.

Fluctuations in the exchange rate of the rupiah against the dollar impacted the exports of Central Java Province. It means that exchange rate fluctuations can cause changes in essential oil exports in Central Java Province. In addition, the strengthening of the rupiah exchange rate can reduce essential oil exports in Central Java Province. The rupiah raises the price of Indonesian products if valued in foreign currencies if the exchange rate strengthens. The demand for Indonesian products abroad will decrease so that exports will decline.

H2: The exchange rate is thought to positively affect essential oil export to the U.S. in Central Java Province.

According to Munandar (2012) the increase in national income (GDP) is expected to increase people's purchasing power to import. U.S. federal income has grown every year, meaning that the U.S. has a remarkable ability to fulfill the needs of its people by importing a product.

H3: The GDP of the export destination country (United States) is thought to positively affect essential oil export to the U.S. in Central Java Province.

METHOD

The type of data used in this research is quantitative data. According to Yusuf and Daris, (2019), Quantitative data is a type of data that can be measured or calculated directly, in numerical information or explanation. This study uses a time horizon, namely the time series. Time series consist of one object but include several periods: daily, monthly, weekly, annual, and others. One or more variables will be observed in one observation unit within a certain period in time-series data. In retrieving data in this study, based on the type of data used, the export price of essential oil in Central Java Province, currency exchange rates, GDP of the export destination countries (U.S.), and the export volume of essential oils in Central Java Province were obtained from the Central Java Province Central Bureau of Statistics in over 30 years (1990-2019).

To analyze the effect of the variable price, exchange rate, and GDP per capita of the export destination country on essential oil export in Central Java Province. The researcher used multiple linear regression analysis to measure the effect of several independent variables on the development of the volume of essential oil exports in Central Java Province as the dependent variable. Data processing is carried out using statistical data processing software

Testing the Significance of the Hypothesis
a) Statistical t-test

Testing the t-test hypothesis can be done by comparing the probability of the regression results with the degree of confidence (5%). If the probability is less than 5% or 0.05, the independent variable significantly affects the dependent variable. Furthermore, vice versa, if the probability is greater than the degree of confidence of 5% or 0.05, the independent variable does not significantly affect the dependent variable.

b) The test simultaneously (Test F)

In testing the hypothesis, the method used compares the probability of the regression results with the degree of confidence (5%). If the probability is less than 5% or 0.05, the independent variables simultaneously significantly affect the dependent variable. Moreover, vice versa, if the probability is greater than the degree of confidence of 5% or 0.05, it means that the independent variables together do not affect the dependent variable significantly.

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c) Coefficient of Determination/ Goodness of Fit (R2)

According to Ekananda (2015), the coefficient of determination shows the percentage of variation in all dependent variables, explained by the resulting regression equation (independent variance variation).

RESULTS AND DISCUSSION
A. Results

This study using the method of multiple linear regression or Ordinary Least Squared (OLS) analysis. The estimation results obtained in this regression analysis are processed through statistical data processing applications with the following results::

Table 1
Results of Study

Variable	Coefficient	Probability	Result
Export Price	1.015991	0.0013	Positive and Significant (H1 Rejected)
Exchange Rate	0.356042	0.2538	Positive and Insignificant (H2 Rejected)
GDP Importing Country (US)	1.646675	0.0142	Positive and Significant (H3 Accepted)

Based on the results of the regression test in the table above, the multiple linear regression analysis equations for this study is:

$$Y = α + β1 X1 + β2 X2 + β3 X3 + e$$

Based on the regression model that has undergone data transformation using logarithms, the regression equation changes to:

$$lnY=-5.830017+1.015991ln(X1)+0.356042ln(X2)+1.646675ln(X3)+ e$$

The regression equation provides the following explanation:

A constant value of -5.830017 tons means that if the export price of essential oil of Central Java Province, Exchange Rate, and GDP Importing Country (U.S.) is worth 0, then export essential oil Central Java Province will decrease 5.830017 million tons. The regression coefficient value on the export price of essential oil in Central Java Province is 1.015991, meaning that if the export price of essential oil in Central Java Province increases by 1%, assuming the exchange rate. The GDP Importing Country (U.S.) is fixed, then the export of essential oil in Central Java Province will increase by 1.015991. The positive value coefficient means a positive relationship between the export price of essential oil in Central Java Province and the export volume of essential oil in Central Java Province.

The regression coefficient value on the exchange rate is 0.356042. The positive value coefficient means a positive relationship between the exchange rate and the volume of essential oil exports in Central Java Province. However, the exchange rate variable has an insignificant impact on the volume of essential oil exports in Central Java Province. So if there is an increase in the exchange rate variable, it is not sure that the volume of essential oil exports in Central Java Province will also increase. The regression coefficient value on the GDP Importing Country (U.S.) is 1.646675. Suppose the GDP Importing Country (U.S.) increases by 1% with the export price of essential oil in Central Java Province. Then, the fixed exchange rate and essential oil export in Central Java Province will increase by 1.646675. The positive value coefficient means a positive relationship between the GDP Importing Country (U.S.) and the export volume of essential oil in Central Java Province.

1. Simultaneous Test (F Test)

Researchers conduct F-test to determine the effect of independent variables on the dependent variable simultaneously or together. The results of the F test in this study have a coefficient value of 49.45399 with a probability of 0.000000. The probability value is less than the significant value of 0.05. The study results have the meaning that the export price, exchange rate, and GDP of the export destination country simultaneously have a significant effect on the volume of essential oil exports in Central Java Province.

2. Partial Test (t-Test)

Researchers conduct a t-test was to determine the effect of the independent variable on the dependent variable partially. The explanation of the output of multiple linear regression is presented as follows:

a) The export price of essential oil in Central Java Province

The probability value obtained by the variable export price of essential oil in Central Java Province in this study is 0.0013. From the probability value of 0.0013, which is smaller than the significant value of 0.05, the export price of essential oil in Central Java Province significantly affects the volume of essential oil exports to the U.S. in Central Java Province.

b) Exchange Rate

The probability value obtained by the exchange rate variable in this study is 0.2538. From the probability value of 0.2538, which is greater than the significant value of 0.05. The exchange rate has no significant effect on essential oil exports to the U.S. in Central Java Province.

c) GDP of the country of export destination

The probability value obtained by this study's GDP variable of export destination countries (U.S.) is 0.0142. From the probability value of 0.0142, which is smaller than the significant value of 0.05, the GDP of the export destination countries (U.S.) significantly affects the volume of essential oil exports in Central Java Province.

3. Determinasi Coefisient Test (Adjusted R^2 Test)

Based on the results of the analysis presented, it is known that the value of the coefficient of determination for the regression model with the variable export price of essential oil in Central Java Province, exchange rates, and GDP of the export destination countries is 0.850885. This value means that 85.0885% of the volume of essential oil exports in Central Java Province is influenced by the export price of essential oil in Central Java Province, exchange rates, and the export destination countries' GDP. In comparison, 14.9115% is influenced by other variables not included in this research model.

B. Discussion

1. The effect of price on the export of essential oil in Central Java Province

In the 1990-2019 time periods, the regression analysis results showed that the variable export price on the volume of essential oil exports in Central Java Province had a positive and significant effect at the 5% level with a coefficient value of 1.015991. This positive influence can be said that any increase in export prices will also increase essential oil exports in Central Java Province. It is not following the hypothesis and not pursuing previous research that export prices negatively affect export volume. Of course, there are several reasons behind this incident.

The excellent quality of essential oils in Central Java has led to high demand in export destination countries and forced destination countries to continue to import essential oils from Central Java even though the price is increasing.

The essential oil export price from the other region have risen faster than Indonesia's, so Indonesia's essential oil export prices have increased. For example, India's essential oil export price compared with Central Java Province essential oil export price:

Table 2
India's Essential Oil Export Price

Year	Price/Kg (USD)	
	India	Central Java Province Indonesia
2013	12,236	5,092
2014	19,706	6,907
2015	20,02	6,781
2016	14,79	6,33
2017	17,643	6,847

Source: Bank of India

2. **The effect of exchange rates on the export of essential oil in Central Java Province**

The exchange rate has a positive but insignificant effect on essential oil export in Central Java Province. Based on the calculation results, the value of the exchange rate coefficient is 0.356042 with a probability of 0.2538 at a 5% significance level. This study found the exchange rate variable has an insignificant impact on the number of essential oil exports in Central Java Province. So if there is an increase in the exchange rate variable, it is not sure that the volume of essential oil exports in Central Java Province will also increase.

3. **The effect of the GDP of the export destination countries on the export of essential oil in Central Java Province**

GDP importing country (U.S.) has a positive and significant effect on essential oil export in Central Java Province. Based on the calculation results, the US GDP coefficient value is 1.646675 with a probability of 0.0142 at the 5% significance level, which means that every 1 USD increase in per capita income of U.S. society will increase the export of essential oil in Central Java Province by 1.65 USD.

These findings are in line with the theory and hypothesis that the per capita income of the export destination countries will positively affect the increase in exports of essential oil in Central Java Province. The higher the GDP per capita of the export destination countries, the demand for essential oils in Central Java Province will increase.

CONCLUSION

The price variable has a positive and significant effect. Based on this research, when the price increases, the number of essential oil exports in Central Java Province will also increase. It is not following the hypothesis and not under previous research that export prices negatively affect export volume. Of course, there are several reasons behind this incident, such as: First, the excellent quality of Central Java Province's essential oil causes high demand in export destination countries. This situation forces destination countries to continue importing essential oil from Central Java even though the export price increases. Second, the essential oil export price from the other region have risen faster than Indonesia's, so Indonesia's essential oil export prices have increased.

The exchange rate has a positive effect and is insignificant on exports. The exchange rate variable has an insignificant impact on the volume of essential oil exports in Central Java Province. If there is an increase in the exchange rate variable, it is not sure that the volume of essential oil exports in Central Java Province will also increase.

United States (U.S.) per capita income has a positive and significant effect on non-oil and gas exports in Central Java. These empirical findings are in line with the theories and hypotheses proposed in this study. At the same time, the GDP per capita of the export destination countries is an external factor that will affect the export of essential oil in Central Java Province. The higher the GDP per capita of the export destination country, the demand for export products of essential oil in Central Java Province will increase.

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