

## Analysis of Indonesian Coffee Exports to the United States of America on 1996-2021 Period

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### Abstract

Coffee is one of the largest international trade commodities in the world. This raises competitiveness and challenges for coffee producing countries in the world to produce good quality products, one of which is Indonesia. The Indonesian plantation sector is an important sector for the national economy, producing superior coffee commodities in the international market. This study aims to determine the effect of Gross Domestic Product real United States, US dollar exchange rate, international coffee prices, Indonesian coffee production, American coffee consumption, and world coffee production on the volume of Indonesian coffee exports to the United States for the period 1996 to 2021 using regression analysis Ordinary Least Square (OLS). The results show that Indonesian coffee production has a positive effect and world coffee production has a negative effect on the volume of Indonesian coffee exports to the United States. Gross Domestic Product US real terms, US dollar exchange rate, international coffee prices, and US coffee consumption have no effect on the volume of Indonesian coffee exports to the US. Indonesian coffee exports to the United States, although still prospective, face quite tight competition in the international market.

**Keywords:** coffee export; gross domestic product riil; international coffee prices; american coffee consumption; exchange rates; world coffee production, ols

### 1. Introduction

International trade is widely carried out by every country because the positive impact of these activities can be felt by trade actors (Grains From Trade). International trade is closely related to globalization. Globalization itself is defined as a process in which the boundaries between countries are becoming increasingly narrow due to the ease of interaction between these countries in various fields, including international trade. The purpose of international trade itself is to increase the economic development of a country, one of which is by carrying out export activities. (Risma et al., 2018).

Indonesia is one of the developing countries that adheres to a small open economic system, meaning that there is international trade, namely buying and selling activities carried out by the state not only domestically but other countries can easily trade with Indonesian citizens. Countries that carry out foreign trade can increase their income by exporting raw materials, semi-finished goods, as well as goods that have been made or used directly. This system, in the international world, will make it easier for a country to develop, especially an economy that has an open system. Countries that use an open system make international trade transactions so that it will add to the country's economy. [1].

The Indonesian state in order to form a strategy so that the value of exports increases, the development of non-oil and gas exports such as goods or services is implemented. This is applied so that exports by the country increase so as to increase state revenues. The impact obtained from this export development will also affect economic growth. Exports made by the Indonesian state can be varied, such as exports of direct use, exports of semi-finished goods, and exports of raw goods. This is done to increase the competitiveness of international free trade so that there is a need for innovation. Plantation products are a commodity that has the potential to be developed into a mainstay of exports in free trade. This is because there are many plantation products in Indonesia. [2].

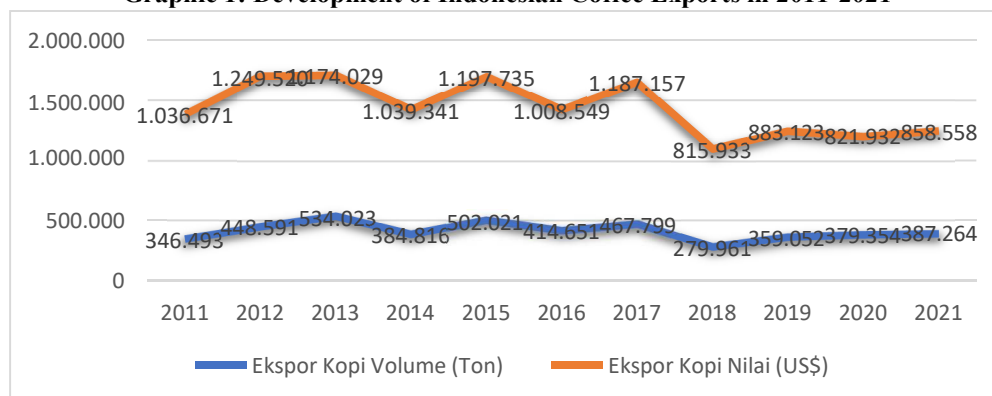
The Indonesian plantation sector is one that plays an important role for the national economy because it relies on several superior commodity products marketed internationally. Indonesia has many plantation products such as tea, coffee and tobacco. These products are Indonesia's flagship in export activities to the free market. The development of the agricultural sector will indirectly improve

the quality of products from plantations so that it can increase the country's exports. The large value of these exports will increase the foreign exchange earned by the country. One of the leading commodities in the plantation sector is coffee. Coffee beans also play a role in encouraging regional development and agro-industrial development. [3].

The first coffee plant in Indonesia was brought by a Dutch man around 1646 with Arabica beans from Arabia. Then, coffee plants began to be planted and spread across various provinces of Indonesia. At one time, a leaf rust disease appeared (coffee leaf rust) that attacks coffee plants in Indonesia. These conditions caused the Dutch East Indies government to import robusta coffee from the Congo, Africa in 1990. (Astuti, 2017)

Coffee is a plantation commodity that has a high economic value among other plantation crops. This means that coffee in Indonesia is one of the mainstay commodities from the plantation sub-sector which plays a quite high role for the Indonesian economy. These roles include being a source of foreign exchange earnings, providing employment, and as a source of income for coffee farmers and other economic actors involved in coffee processing and utilization [4]. Graph 1 shows the development of Indonesia's coffee exports from 2011 to 2021.

**Graphic 1: Development of Indonesian Coffee Exports in 2011-2021**



Data source: (Central Statistics Agency, 2021) processed

Graph 1 shows that Indonesia's coffee exports from 2011 to 2021 have fluctuated, although the trend tends to decline. In 2011, Indonesia's coffee exports were valued at US\$1,036,671 million with a volume of 346,493 tons. Export Indonesian coffee increased by US\$1,249,520 million with a volume of 448,591 tons in 2012. However, the export value of this commodity decreased again in 2013, amounting to US\$1,174,029. In 2014, both experienced a decrease of US\$ 1,039,341 million with a volume of 384,816 tons. In 2015, Indonesia's coffee exports experienced another increase of US\$1,197,735 million with a volume of 502,021 tons. However, in 2016 Indonesia's coffee exports decreased again by US\$ 1,008,549 million with a volume of 414,651. In 2017, Indonesia's coffee exports increased by US\$1,187,157 million with a volume of 467,799 tons. However, the value of Indonesian coffee exports continued to decline until it reached its lowest limit of US\$815,993 with a volume of 279,961 in 2018. Indonesian coffee exports had risen to US\$883,123 million with a volume of 359,052 tons in 2019. However, the export value of these commodities returned decreased in 2020 to US\$821,932 million. Indonesia's coffee exports will reach US\$858,558 million with a volume of 387,264 tons in 2021. The decline in coffee exports is due to the late coffee harvest, coffee stocks that are not available, and domestic coffee consumption has increased. (Central Bureau of Statistics, 2021).

Adam Smith stated that free trade occurs because a country produces and exports goods where the country has an absolute advantage or absolute advantage over other countries. Absolute profit is defined as profit expressed in the number of hours per day of work needed to make goods. Smith also explained that a country is said to have an absolute advantage if it is able to produce an item at a lower cost than other countries. It is this excess production that is not consumed that causes the existence of an exporting country. [5].

According to comparative advantage, exports can occur due to several factors including, the ability of a country to produce goods exported, the quality and price of goods, the taste of foreign residents, exchange rates, people's income, the cost of transporting goods, and government policies related to international trade. In other words, a country will benefit from international trade if it specializes in production and exports goods by producing relatively more efficiently and importing goods where the country has relatively less efficient production. [6].

According to mercantilism, the occurrence of an export is greater than the import because the only way for a country to become rich and powerful is to protect the country's economy by acquiring additional precious metals. The more the more precious metals owned by a country, the richer and strong country. Because each country cannot simultaneously produce export surplus. (Hadirianti, 2019).

Based on the background above, this study will observe the effect Gross Domestic Product (GDP), United States (GDP), exchange rates, international coffee prices (HKI), domestic coffee prices (HKD), Indonesian coffee production (PKD), consumption and world coffee production (PKD) on Indonesian coffee exports to America for the 1996-2021 period.

## 2. Literature Review

Wardani dan Sunyigono (2021), during the period 2008 to 2017 using regression analysis Ordinary Least Square (OLS) and Revealed Comparative Advantage (RCA), found that the rupiah exchange rate variable against the US dollar and the RCA value variable both had a positive influence on Indonesian pepper exports to India with a regression coefficient of 0.941 and 419.757 with a significant empirical value ( $t$ ) respectively 0.022 ( $< 0.5$ ) and 0.013 ( $< 0.5$ ). While the variables of national pepper production, Indonesian pepper export prices, and Indian consumption have no effect on Indonesian pepper exports to India with a significant empirical value ( $t$ ) respectively 0.991 ( $> 0.5$ ); 0.087 ( $> 0.5$ ); 0.097 ( $> 0.5$ ).

Suardani dan Karmini (2017), using regression Ordinary Least Square (OLS) and the case study method, found that partially the amount of production and the dollar exchange rate had a positive effect on silver handicraft exports in Bali Province with a regression coefficient of 5.165 and 1.750 with empirical significance ( $t$ ) of 0.000 ( $< 0.05$ ) and 0.041 ( $< 0.05$ ). While the workforce has no influence on the export of silver handicrafts in the Province of Bali with empirical significance ( $t$ ) of 0.929 ( $> 0.05$ ).

Ayu et al. (2022), during the period 1989 to 2018 using regression analysis Error Correction Model (ECM), found that in the short term the population of Japan, the Japanese exchange rate, world tea prices, and the IJEPA cooperation agreement had a positive effect on Indonesian coffee exports to Japan, with a regression coefficient of 7.09 respectively; 12.78; 269.55; and 11,270,238 with empirical significance ( $t$ ) of 0.0214 ( $< 0.05$ ) and 0.0010 ( $< 0.05$ ). Then, consumption, world coffee prices, and inflation have a negative effect on Indonesian coffee exports to Japan, with a regression coefficient of -266.71; -185,770; and -183.522 with empirical significance ( $t$ ) of 0.0010 ( $< 0.05$ ), 0.0001 ( $< 0.05$ ), and 0.0108 ( $< 0.05$ ). Meanwhile, Indonesian coffee production and Gross Domestic Product (GDP) has no effect on the volume of Indonesian coffee exports to Japan, with empirical significance ( $t$ ) of 0.4008 ( $> 0.05$ ) and 0.3519 ( $> 0.05$ ).

Irawan (2018), during the period 1995 to 2015, used regression analysis Ordinary Least Square (OLS), found that palm oil production and the rupiah exchange rate against the dollar had a negative effect on the volume of palm oil exports with regression coefficients of 0.2472 and 0.0532 with empirical significant values ( $t$ ) of 0.1912 ( $> 0.1$ ) and 0.8625 ( $> 0.1$ ). Meanwhile, the area of land and the price of world palm oil has a positive effect on the volume of exports of palm oil, with a regression coefficient of 1.9176 and 0.5484 with a significant empirical value of 0.0336 ( $< 0.1$ ) and 0.0053 ( $< 0.1$ ).

Suparsa et al. (2015), period 2000 to 2013, using index analysis Revealed Comparative Advantage (RCA) and regression Ordinary Least Square (OLS), found that the RCA value for the Bali Province crab commodity only had competitiveness for three years, namely, 2000, 2008, and 2013 with an RCA value of 1.0341; 1.3408; and 1.3389 ( $RCA > 1$ ), which means that the Bali Province crab commodity cannot be used as a leading sector for the Province of Bali. While on the regression Ordinary Least Square (OLS) shows that the United States dollar exchange rate has a positive and significant effect on crab exports in Bali Province with a regression coefficient of 181.8125 and an empirical significant value ( $t$ ) of 0.0005 ( $< 0.05$ ). While inflation and prices have no significant effect on the crab exports of Bali Province with a significant empirical value ( $t$ ) of 0.5058 ( $> 0.05$ ) and 0.7145 ( $> 0.05$ ).

Suhartawan & Sudirman (2016), period 2000 to 2015, using regression analysis Ordinary Least Square (OLS), found that land area, United States dollar exchange rate, and wholesale price index partially had a positive and significant effect on Indonesian tea exports with  $t$  count  $>$  table value of 2.674  $>$  1.782; 2.854  $>$  1.782; and 1.810  $>$  1.782 with a significant empirical value ( $t$ ) of 0.013 ( $< 0.05$ ); 0.010 ( $< 0.05$ ); and 0.034 ( $< 0.05$ ).

Sugiarsa dan Indrajaya (2012), during 1995 to 2010, using regression analysis Ordinary Least Square (OLS), found that the amount of copper production partially has a positive and significant

effect on the volume of Indonesian copper exports with a  $t$  count  $>$   $t$  table value of  $4.755 > 1.782$  with an empirical significant value ( $r$ )  $t$  of  $0.000 (< 0.05)$ . Meanwhile, copper prices and investment have no significant effect on the volume of Indonesian copper exports with a significant empirical value ( $r$ )  $t$  of  $0.072 (> 0.05)$  and  $0.355 (> 0.05)$ .

Hodijah dan Angelina (2021), during the year 1999 to 2020, using the method Error Correction Model (ECM), found that in the short and long term exports had a positive and significant effect on economic growth with a short-term regression coefficient of  $3.90E-05$  and a long-term value of  $5.87E-05$  with a significant empirical value ( $r$ )  $t$  short term of  $0.0035 (< 0.05)$  and long term of  $0.0175$ . Meanwhile, imports have a negative and significant effect on economic growth with a short-term regression coefficient of  $-1.66E-05$  and a long-term regression coefficient of  $-3.92E-05$  with a significant value empirical ( $r$ ) short term  $t$  is  $0.0803 (> 0.05)$  and long term is  $0.0499 (> 0.01)$ .

During 1970 to 2011, using regression analysis Ordinary Least Square (OLS), Putra (2013), found that tobacco land area had a negative and significant effect on the volume of Indonesian tobacco exports to Germany with a regression coefficient of  $-0.8255$  and an empirical significant value ( $r$ )  $t$  of  $0.0762 (< 0.1)$ . Then, world tobacco prices and Germany's real GDP both have a positive effect on the volume of Indonesian tobacco exports to Germany with regression coefficients of  $0.7842$  and  $1,465.7$  and empirically significant values ( $r$ )  $t$  of  $0.03 (< 0.1)$  and  $0.0002 (< 0.1)$ . Meanwhile, tobacco production has no significant effect on the volume of Indonesian tobacco exports to Germany with a significant empirical value ( $r$ )  $t$  of  $0.4477 (> 0.1)$ .

Widhi Ari dan Meydianawathi (2014), from 1996 to 2012, using the regression analysis method Ordinary Least Square (OLS), found that United States GDP had a positive and significant effect on exports of Indonesian woodcarving crafts to the United States with a regression coefficient of  $0.510$  and an empirical significant value ( $r$ )  $t$  of  $0.000 (< 0.05)$ . Meanwhile, inflation, investment, and exchange rates had a negative and significant effect on exports of Indonesian woodcarving crafts to the United States with a regression coefficient of  $-19.387$ ;  $-0.032$ ; and  $-0.045$  with empirical significance ( $r$ )  $t$  of  $0.021 (< 0.05)$ ;  $0.001 (< 0.05)$ ; and  $0.004 (< 0.05)$ .

M. Lestari (2011), during 2005 to 2009, used regression analysis Ordinary Least Square (OLS) found that, GDP has a positive effect on textile exports in Indonesia with a regression coefficient of  $0.1501$  and an empirical significant value ( $r$ )  $t$  of  $0.0352 (< \alpha = 0.05)$ . Meanwhile, the exchange rate has a negative effect on textile exports in Indonesia with a regression coefficient of  $-0.6618$  and a significant empirical value of  $0.0093 (< 0.05)$ . Then inflation does not have a positive effect on textile exports in Indonesia with a significant empirical value ( $r$ )  $t$  of  $0.0834 (> 0.05)$ .

Salsabila (2021), from 2013 to 2020, uses regression analysis Ordinary Least Square (OLS), found that oil and gas exports had a positive effect on Indonesia's economic growth with a regression coefficient of  $0.0667$  with a significant empirical value ( $r$ )  $t$  of  $0.0079 (< 0.05)$ . While non-oil and gas does not have a significant effect on Indonesia's economic growth with a significant empirical value ( $r$ )  $t$  of  $0.5115 (> 0.05)$ .

Mustika et al. (2015), from 1993 to 2011, using regression analysis Ordinary Least Square (OLS) and analysis Error Correction Model, found that in the regression Ordinary Least Square (OLS) exports and imports of crude oil have a positive effect on economic growth in Indonesia with a regression coefficient of  $0.0073$  and  $0.0034$  and a significant empirical value ( $r$ )  $t$  of  $0.000 (< 0.05)$  and  $0.000 (< 0.05)$ . Then on to the analysis Error Correction Model (ECM) in the long run together the value of exports and imports of petroleum has a significant effect on Indonesia's economic growth with a calculated  $t$  value on exports of  $-8.5552$  and a calculated  $t$  value on imports of  $8.0541$ .

Sarwono dan Pratama (2012), from 1989 to 2013, used regression analysis Ordinary Least Square (OLS), found that Indonesia's soybean production, exports Indonesian soybeans, and government policies have a positive and significant effect against the index Revealed Comparative Advantage (RCA) Indonesian soybeans with regression coefficient of  $0.0000000485$  and  $0.0000000777$  with a significant value empirical ( $r$ )  $t$  of  $0.0246 (< 0.05)$  and  $0.000 (< 0.05)$ . While the exchange rate is not negative effect on the index revealed comparative advantage soya bean Indonesia with significant empirical value ( $r$ )  $t$  of  $0.0805 (> 0.05)$ .

### 3. Research Methods

The tool used in this research is regression analysis Ordinary Least Square (OLS) with the following econometric model:

$$\log(EKS_t) = \beta_0 + \beta_1 \log(GDPR_t) + \beta_2 \log(Kurs_t) + \beta_3 \log(HKI_t) + \beta_4 \log(Prod_t) + \beta_5 \log(Kons_t) + \beta_6 \log(PKD_t) + \mu_t$$

where:

EKS	= Indonesian Coffee Export Volume to the United States (tons)
GDPR	= Gross Domestic Product United States Real (US\$)
Kurs	= United States Dollar Currency Exchange Rate (Rp)HKI
	= International Coffee Price (US\$)
Prod	= Indonesian Coffee Production (ton)
Kons	= American Coffee Consumption (ton)
PKD	= World Coffee Production (ton)
<i>log</i>	= Logarithmic Operations
$\mu_t$	= Error Term
$\beta_0$	= Constant
$\beta_1 \dots \beta_3$	= Independent Variable Regression Coefficient
<i>t</i>	= Year <i>t</i>

The econometric model above is a modification of the model (Chadhir et al., 2015) and the model of Soviandre et al., (2014). Production, inflation, domestic coffee production, and international coffee prices are thought to have a positive influence on the volume of Indonesian coffee exports to the United States.

The research data used is datatime series from January 1996 – December 2021, obtained from various sources, International Coffee Organization, World Bank, and the Central Bureau of Statistics. The data used is the Volume of Indonesian Coffee Exports to the United States (EX), Gross Domestic Product real United States (GDPR), United States Dollar Currency Exchange Rate (Kurs), International Coffee Prices (HKI), Indonesian Coffee Production (Prod), consumption (Kons), and World Coffee Production (PKD).

Data analysis estimation stage time series will include the parameter estimation stage of the econometric model; Classical Assumption Test which includes Multicollinearity Test, Residual Normality Test, Autocorrelation Test, Heteroscedasticity Test, Linearity Test and Model Specification Test; The goodness-of-fit test of the model includes Model Existence Test and interpretation of the Coefficient of Determination (R<sup>2</sup>); and ends with the Influence Validity Test (t test).

## 4. Estimation Result

The estimation results of the econometric model above and their complementary tests are summarized in Table 1.

**Table 1:** Econometric Model Estimation Results

$\log(EKS_t) = -11,1382 + 1,1931 \log(GDPR_t) - 0,2062 \log(Kurs_t) + 0,0961 \log(HKI_t)$	
	$+ 0,5317 \log(Prod_t) - 1,1612 \log(Kons_t) - 1,2042 \log(PKD_t) + \mu_t$
	$(0,1260) \quad (0,3671) \quad (0,5414)$
	$(0,0778) \quad (0,4495) \quad (0,0883)$
$R^2 = 0,4405$ ; DW = 1,2076 ; F-Stat. = 2,4936 ; Prob. F-Stat. = 0,0596	
Diagnostic Test	
(1) Multikolinieritas (VIF)	Log(Kurs) = 4,3845 ; log(HKI) = 1,8548 ; log(Prod) = 2,9714 ; log(PKD) = 8,0332
(2) Normality Residual	JB(2) = 1,3523 ; Prob. JB(2) = 0,5085
(3) Otokorelation	(3) = 6,2516 ; Prob. $\chi^2$ (3) = 0,0957
(4) Heteroskedastisitas	(12) = 10,0904 ; Prob. $\chi^2$ (12) = 0,6080
(5) Linieritas	F(1,18) = 1,1058 ; Prob. F(1,18) = 0,3069

Source: e-views 2023

The diagnostic test shows that the estimated model does not experience problems with residual normality, autocorrelation, heteroscedasticity, and linearity tests. The model can be seen from the probability of the test statistic, each of which has a value of 0.5085 (> 0.10); 0.0957 (> 0.05); 0.6080 (> 0.10); and 0.3069 (> 0.10). MarkVIF exchange rate variables, international coffee prices,

Indonesian coffee production, and world coffee production  $VIF < 10$ , while variable Gross Domestic Product United States real and American coffee consumption has a value  $VIF > 10$ , showing that the estimated model has multicollinearity problems in the variables Gross Domestic Product United States real estate and American coffee consumption.

Adaptive goodness statistics (goodness of fit) shows that the model exists, as seen from the statistical empirical probability  $F$ , which is  $0.0596 (< 0.10)$ , with  $R^2$  or moderate predictive power, which is equal to  $0.4405$ . That is, as a whole the independent variables, Gross Domestic Product real United States (GDPR), US Dollar Exchange Rate (Kurs), International Coffee Prices (HKI), Indonesian Coffee Production (Prod), American Coffee Consumption (Cons), and World Coffee Production (PKD), can explain that  $44.05$  percent of the variation or ups and downs of the Indonesian Coffee Export Volume variable to the United States (EKS).

Separately, only the variables of Indonesian Coffee Production and World Coffee Production have an influence on the Volume of Indonesian Coffee Exports to the United States, with an empirical probability ( $r$ )  $t$  of  $0.0778 (< 0.10)$  and  $0.0883 (< 0.10)$ . Variable Gross Domestic Product real United States, United States Dollar Exchange Rate, International Coffee Prices, and American Coffee Consumption have no effect on the Volume of Indonesian Coffee Exports to the United States, because it has an empirical probability of  $0.1260 (> 0.10)$ ;  $0.3671 (> 0.10)$ ;  $0.5414 (> 0.10)$ ; and  $0.4495 (> 0.10)$ .

Indonesian Coffee Production Variable has a regression coefficient of  $0.5317$ . The relationship pattern between Indonesian Coffee Production and Indonesian Coffee Export Volume to the United States is logarithmic, meaning that if Indonesian Coffee Production increases by  $1$  percent, Indonesian Coffee Export Volume to the United States will increase by  $0.5317$  percent. Conversely, if the volume of Indonesian coffee exports to the United States drops by  $1$  percent, Indonesian coffee production will decrease by  $0.5317$  percent.

World Coffee Production Variable has a regression coefficient of  $-1.2042$ , has a significant negative effect. The relationship pattern between World Coffee Production and Indonesian Coffee Export Volume to the United States is logarithmic, meaning that if World Coffee Production increases by  $1$  percent, Indonesian Coffee Export Volume to the United States will increase by  $1.2042$  percent. Conversely, if the volume of Indonesian coffee exports to the United States drops by  $1$  percent, then world coffee production will decrease by  $1.2042$  percent.

## 5. Discussion

The level of volume of Indonesian coffee exports to the United States during the 1996- 2021 period, was in fact influenced by Indonesian coffee production and world coffee production, while Gross Domestic Product United States real, US dollar exchange rate, international coffee prices, and American coffee consumption have no effect.

Gross Domestic Product United States real estate has no effect on the volume of Indonesian coffee exports to the United States. In this case it shows that Gross Domestic Product United States real estate is not a factor that has a major influence on the volume of Indonesian coffee exports to the United States.

The US dollar exchange rate was found to have no effect on the volume of Indonesian coffee exports to the United States. In this case, the determination of a price

Commodities traded depend on commodity prices in the agreed currency at the prevailing exchange rate and due to the high supply of coffee exports from Indonesia to the United States and the Indonesian Coffee Production factor is more influential than the Rupiah Exchange Rate against the US Dollar, so that the Rupiah exchange rate against the US dollar does not affect the volume of coffee exports from Indonesia to the United States.

International coffee prices were found to have no effect on the volume of Indonesian coffee exports to the United States. This is because the price of coffee exported is determined by the international coffee market and developments in coffee drinking trends and lifestyles in society. This means that the high international coffee price will cause an increase in the volume of Indonesian coffee exports to the United States.

Indonesian coffee production has a positive influence on the volume of Indonesian coffee exports to the United States. This means that an increase in the amount of production will result in a high export volume that applies to the amount of production in Indonesia. When production increases, product availability increases so that domestic and foreign offers increase. Production is able to increase exports if the products produced by each company are able to increase the quality in accordance with the quality set by the destination country for Indonesian coffee exports to the United States. Thus, Indonesian coffee production is able to increase Indonesian coffee exports to the United

States. Conversely, if production decreases, Indonesia's coffee exports to the United States will also decrease.

American coffee consumption was found to have no effect on the volume of Indonesian coffee exports to the United States. This is because Indonesia is not the only coffee importing country in the United States. So that the United States can meet the needs of coffee consumption from other countries and the supply of coffee obtained from importing countries does not only come from Indonesia, so that in this case the coffee consumption of importing countries is not so dependent on Indonesia.

World coffee production was found to have a negative effect on the volume of Indonesian coffee exports to America. This means that when world coffee production increases, the volume of Indonesian coffee exports to the United States will decrease. This condition occurs because the world's coffee production is too high, so the country chooses to produce a commodity. Therefore, in this case the increase in world coffee production will increase the volume of Indonesian coffee exports to the United States.

## 6. Conclusion

Based on regression analysis Ordinary Least Square (OLS) does not experience residual normality, autocorrelation, heteroscedasticity, and linearity tests, but there are two variables that have multicollinearity problems, namely the variable Gross Domestic Product United States real estate and United States coffee consumption. The estimated model exists, with  $R^2$  of 0.4405. That is, as a whole the independent variables, Gross Domestic Product real United States, exchange rate The United States Dollar, International Coffee Prices, Indonesian Coffee Production, American Coffee Consumption, and World Coffee Production, can explain that 44.05% of the variation or rise and fall of the Indonesian Coffee Export Volume variable to the United States. While the remaining 55.95% is explained by other variables not included in the study.

The results of the effect validity test stated that Indonesian coffee production had a positive effect and world coffee production had a negative effect on the volume of Indonesian coffee exports to the United States. Whereas, Gross Domestic Product United States real estate, US dollar exchange rate, international coffee prices, and American coffee consumption have no effect on the volume of Indonesian coffee exports to the United States. This means that if world coffee production increases, there is a possibility that the volume of Indonesian coffee exports to the United States will decrease. However, if Indonesia's coffee production increases, the volume of Indonesian coffee exports to the United States could be increased. In that case, it can be concluded that Indonesia still has the potential to export coffee to the United States, but must face quite tight competition with coffee exporting countries in the international market regarding the quality of the coffee produced.

In an effort to increase the export value which is still experiencing obstacles, the Indonesian government needs to implement appropriate policies to increase coffee production in order to maintain the stability of Indonesia's coffee export volume in the international market. In that case, the government needs to cooperate with the countries coffee exporters, especially in the field of technology that is useful for coffee farmers in Indonesia to maximize the volume of domestic coffee production. In addition, to strengthen in facing the competition for Indonesian coffee exports which is quite tight in the international market with other countries, it is necessary to pay attention to the quality of the coffee produced by developing superior varieties of coffee plants and applying better plantation processing techniques in terms of planting, picking, fertilizing systems, and pest control.

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