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FACTORS AFFECTING INDONESIAN ARABICA COFFEE EXPORT

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ABSTRACT
The purpose of this study is to analyze the development of Indonesian coffee exports, coffee export prices, Indonesian coffee production and consumption, the rupiah exchange rate (exchange rate) in the international market, and analyze the factors that influence the supply of Indonesian coffee exports. The data analysis method used is descriptive method and quantitative method. The quantitative method used to analyze the factors that affect the volume of Indonesian coffee exports in the short term is the Error Correction Model (ECM) approach. The result of showed that the development of Indonesian coffee exports in 1990-2020 showed fluctuations in both the volume, value, and price of Indonesian coffee exports. Based on the results of the analysis using ECM, it was found that the supply of Indonesian coffee exports in the short term was significantly influenced by coffee production and had a positive effect. Meanwhile, Indonesia's coffee export supply in the long term is significantly influenced by coffee production and international coffee prices and the effect is positive. Meanwhile, only in the long term, coffee export prices have a significant negative impact on Indonesia's coffee export supply. The implications of policies that can be taken by the government to maintain or increase market share in conditions of increasingly fierce competition are that coffee productivity must be increased (reduce production costs) so that the relative price of Indonesian coffee is cheaper and in the end the competitiveness of Indonesian coffee exports can increase. In addition, there is a need for a policy of diversifying coffee products into processed coffee through the use of post-harvest technology so as to create added value for coffee to overcome fluctuations in domestic and international coffee prices.

KEY WORDS
Coffee, export, error correction model, price, rupiah exchange rate.

Indonesia is a country rich in agricultural products, an advantage that many countries in the world do not have. The plantation sub-sector as one of the leading sub-sectors has several commodities that still need to be developed both in cultivation, processing and marketing, one of the leading commodities that must be cultivated is coffee (Fathah, 2018). Coffee is a plantation crop that has advantages for the national economy and coffee is one of the plantation products that is widely traded in the international market (Daya A et al, 2018).

Export is the main goal in offering coffee products produced from Indonesia. Coffee plants have become a commodity that has a relatively increasing value in the world market (Ginting, et al, 2019). Therefore, there are still opportunities for world coffee producers, especially Indonesia, to be able to meet consumer demand in a more satisfying way than that of competing countries (Sari E.T., et al,2013). Coffee commodities are the top 3 main and potential commodities, including Indonesia's non-oil and gas exports, where coffee is a leading commodity that must be developed more (Putri N.H., et al, 2018).

Indonesia's coffee production is mostly to meet foreign market demand. Based on FAOSTAT (2022) and ICO (2022) data, until 2020, the domestic coffee market only absorbs about 26.90 percent for consumption from the total coffee production. According to [6] the proportion of Indonesian coffee products exported reached 67% of the total production and the rest for domestic consumption. With abundant production but low absorption of the domestic market, Indonesian coffee is highly dependent on international markets. Among several plantation commodities, coffee is one of the potential export commodities, seen from the export volume and export value which is quite large. In terms of overall performance,

Indonesia's coffee exports fluctuate both in value and volume (Figure 1). In value, coffee exports increased by an average of 7.09% per year during the period 1990-2020, but in its development the trend has changed several times. Recognizing the potential for coffee exports, the Ministry of Trade categorizes coffee as one of ten prospective export products whose exports continue to be encouraged in order to continue to support Indonesia's overall export performance.

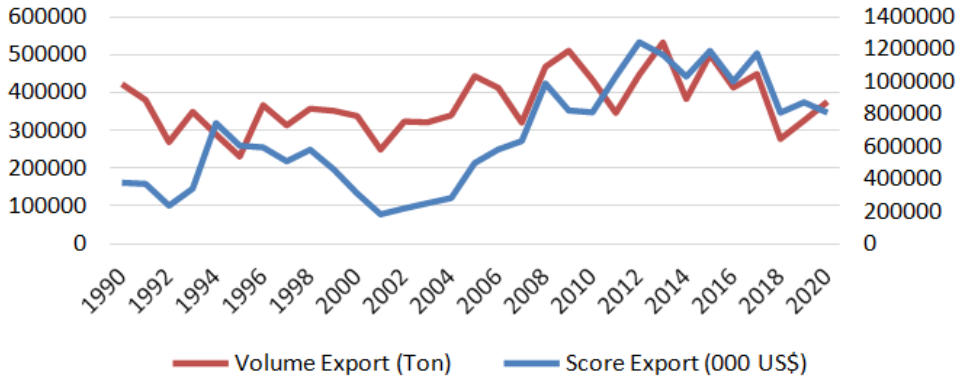

Figure 1 – Development of Indonesian coffee exports 1990-2020. Source: FAOSTAT (2022)

In the world coffee market, Indonesia has a strategic position. According to the International Coffee Organization (ICO, 2022), Indonesia is the fourth largest coffee producing country in the world after Brazil, Colombia and Vietnam. Indonesia also ranks fourth as the largest coffee exporter in the world, and even ranks second for the type of Robusta coffee after Vietnam.

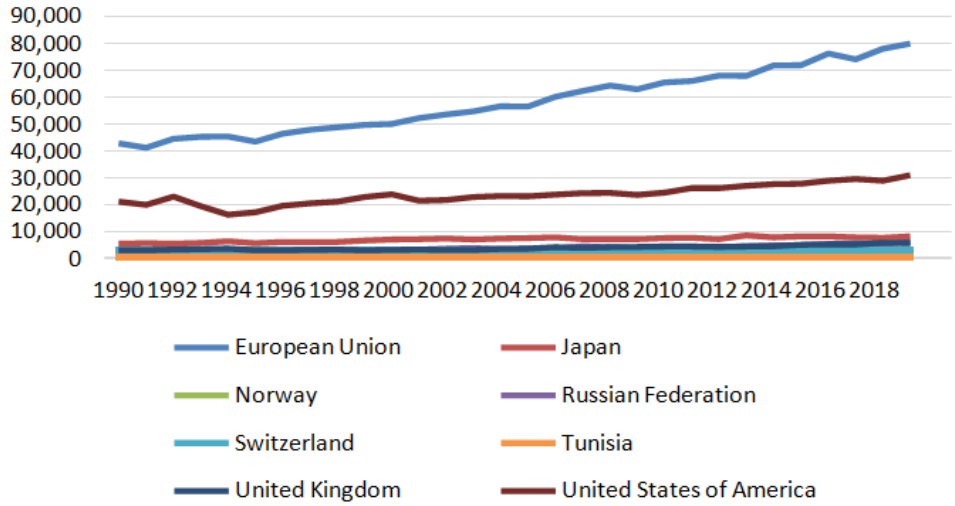

Figure 2 – Development of coffee imports by largest importing country 1990-2019 Source: ICO (2022)

According to ICO data (2022), the total world coffee imports in 2019 reached 8.09 million tons. The world's largest coffee importers in 2019 in order, namely: the European Union (59.32%), the United States (22.9%), Russia (4.3%), the UK (4.1%), Switzerland (2.4%), Norway (0.6%) and Tunisia (0.37%). Figure 2 shows that world coffee demand from year to year continues to increase. This condition is an opportunity for Indonesia to increase its coffee exports. However, in its development, Indonesia's coffee exports are influenced by several factors that cause fluctuations such as export policies and the constantly changing world coffee prices.

One of the most famous coffees to date is Arabica coffee. Arabica types dominate 70 percent of coffee production from all over the world. In addition, if we look at the level of

consumption, around 70% of the world's population is consumers of Arabica coffee, which has a mild and aromatic taste. Meanwhile, the remaining 30% of the world's population are Robusta coffee consumers, which have a bitter taste and 50% higher caffeine content than Arabica coffee. Arabica coffee is also often referred to as Brazilian coffee because it is the place of origin. In the coffee trade, Indonesia seeks to increase domestic coffee production, especially the Arabica type, by increasing productivity from its current condition of <800 kg per hectare (ha) to 3000 kg/ha through the expansion of Arabica coffee in 12 provinces, 22 districts covering an area of 2590 Ha and Rejuvenation of Arabica Coffee in 6 Provinces 14 Regencies covering an area of 1670 Ha (Directorate General of Plantations 2021). This is considering the potential of Arabica coffee which is quite large in the Indonesian economy so that it is expected to increase foreign exchange for the country. The increase in production is mainly carried out through improving the quality of plants.

In the Indonesian market, the price of Arabica coffee is much higher than that of Robusta coffee. For example, prices as of 7 April 2020 for Brazilian Naturals US cents 116.14 per/lb and Robusta US cents 65.45/lb, or equivalent to Rp 42,017/kg for arabica and Rp 23,678/kg for robusta. In addition, the existence of major Arabica coffee producing countries such as Brazil, Colombia, Guatemala, Costa Rica, Mexico resulted in the development of Indonesian Arabica coffee exports in the long term absolutely necessary in order to continue to contribute to the Indonesian economy. Based on the description above, coffee is an important commodity for Indonesia because of its large contribution to foreign exchange and good market potential. Therefore, based on the explanation above, it is very interesting to study more deeply with the aim of analyzing the development of Indonesian coffee export volume,coffee export prices, Indonesian coffee production and consumption, the rupiah exchange rate (exchange rate) in the international market and analyzing the factors that influence supply. Indonesian coffee exports and the influence of each of these factors.

METHODS OF RESEARCH

The type of data used in this study is secondary data obtained from FAOSTAT statistics, Central Statistics Agency, World Bank and ICO statistics. The form of the data is an annual time series for the period 1990 to 2020. The data used in this study include export volume of Indonesian coffee (tonnes), coffee production (tonnes), domestic coffee consumption (tonnes), international coffee prices (US$/Kg).), Coffee export price (US$/Kg) and Rupiah exchange rate against US Dollar (RP/US$).

The data analysis method used is descriptive method and quantitative method. Descriptive method is used to analyze the development of the data used in this study, namely the development of Indonesian coffee exports, the development of coffee production, the development of domestic coffee consumption, the development of international coffee prices. The quantitative method used to analyze the factors that affect the volume of Indonesian coffee exports in the short term is the Error Correction Model (ECM) approach and the long-term analysis using the cointegration equation. The basis for using exogenous variables in this study is the research conducted by Turnip (2002) and Lubis (2002). The selection of exogenous variables is also based on supply theory, namely the factors that influence export supply, including domestic production and consumption. International coffee prices and coffee export prices are used in the export supply equation model to find out how changes in commodity prices affect export supply, and the exchange rate as a variable that can describe changes in domestic and foreign economic conditions.

Stationarity testing of the data conducted on all variables in the research model is based on the Augmented Dickey Fuller test (ADF test). The analytical tool used for data processing in this study is operated with EViews 11 and Microsoft Excel 2019. The first step taken in the ECM method is to test the stationary of the variables used using the ADF test (Augmented Dickey-Fuller). The requirement for ECM modeling to be carried out is that all variables must not be stationary at the level, at least at the first difference. In this study stationary at the first difference, then the formation of a long-term model with the OLS

estimation method. In the long-term model, the independent variable is regressed against the dependent variable at the level. The long-term equation formed is as follows:

$$LNVK = b\ 0 + b\ 1\ LNPROD\ t + b\ 2\ LNCONS\ t + b\ 3\ LNPE\ t + b\ 4\ LNPINT\ t + b\ 5\ LNEXC\ t + U\ t \quad (1)$$

Where: LNVKt = Total volume of Indonesian coffee exports in period t; LNPRODt = Coffee production period t; LNCONSt = Domestic consumption of coffee in period t, LNPet = Coffee export price for period t; LNPINTt = International coffee price for period t; LNEXCt = Exchange rate of Rp against US Dollar for period t, Ut = error distribution period t.

Furthermore, cointegration testing by testing the long-term equation residual stationary. If the long-term equation residual is stationary at the level, it can be said that there is cointegration between the variables used in the study. After the cointegration test, the formation of the ECM model becomes a short-term equation. The ECM model is formed by entering the first lag of the long-term equation residual into the regression equation for variables that are stationary at the same difference (this study is at the first difference). The ECM model formed is as follows:

$$DLNVK = b_0 + b_1\ DLNPROD_t + b_2\ DLNCONS_t + b_3\ DLNCONS_{t-1}\ b_4\ DLNPE_t + b_5\ DLNPINT_t + b_6\ DLNEXC_t + b_7\ DLNEXC_{t-1} + e_t \quad (2)$$

Where: D = the first difference (first difference); LNVKt = Total volume of Indonesian coffee exports in period t; LNPRODt = Coffee production period t; LNCONSt = Domestic consumption of coffee in period t; LNCONSt-1 = Domestic consumption of coffee in the previous t-1 period; LNPet = Coffee export price for period t; LNPINTt = International coffee price for period t; LNEXCt = Exchange rate of Rp against US Dollar for period t; LNEXCt-1 = Exchange rate of Rp against US Dollar in the previous t-1 period; Et = error distribution period t.

RESULTS AND DISCUSSION

The development that occurred in the volume of Indonesian coffee exports was an average growth of 2.42% in the period 1990-2020. The value of Indonesian coffee exports experienced an average growth of 7.09% in the period 1990-2020. During the period 1990-1998 the value of coffee exports ranged from US$ 744.68 million – US$ 236.22 million with an increasing trend of 13.02% per year, but from 1994 to 1998 it had a declining trend of 5.37% per year. This is an integration of global conditions due to the implementation of market liberalization for coffee products in 1990, resulting in price instability. At the beginning of the liberalization period, namely in the mid-1989 to 1993 period, international coffee prices fell and began to rise again in 1994. After declining in the 1994-1998 period, exports fell back to their lowest values in 1999-2004. This is the period in which the value of Indonesian coffee exports reached its lowest value during the observation period. This is an integration of the coffee crisis/coffee crisis (coffee commodity price slump) which affects producing countries. With the lowest point in 2001, amounting to US$ 182.9 million, in 2002 the value of exports began to rise slowly to reach US$ 283.3 million in 2004.

After 2004, the export value increased again in line with the increase in international coffee prices, until in 2011, coffee exports reached US$ 1.03 billion. In the midst of sluggish national exports and the ongoing economic crisis in European countries, coffee commodities in 2011 were still able to increase the export value by 27.36%, but due to the lack of demand for coffee, the volume of Indonesian coffee exports decreased by 20.03%.

However, the COVID-19 pandemic has reduced coffee export performance which is reflected in the decline in the value of its exports by 25.14% in March 2020 as the initial month when COVID-19 cases were discovered in Indonesia (Table 1). In May the government implemented a transition period in the form of a new normal (adaptation of new habit patterns) which loosened social activities while still implementing health protocols, such

as wearing masks, maintaining distance, and avoiding crowds. Therefore, in May the value of Indonesian coffee exports increased by 12.54% from the previous month, then in the following months gradually returned to normal. This indicates that the transitional policy has proven to be effective in stabilizing the growth of Indonesia's coffee exports.

Table 1 – Dynamics of Indonesian coffee exports in 2020

Year	Export Value	%Change in Value
January 2020	8222031	
February 2020	7643393	-7.04%
March 2020	5721979	-25.14%
April 2020	5900123	3.11%

Source: BPS 2021.

In the period 1990-2000, the development of coffee production has a tendency to increase by an average of 3.19%. In the period 2000-2020, the development of Indonesian coffee production tends to fluctuate every year, with an average development of 2.03%. From 2000 to 2001, Indonesian coffee production increased by 2.64%. In 2002 Indonesia's coffee production experienced a fairly good increase of 19.81%. This is due to the increasing demand for world coffee exports. In 2003 coffee production decreased by 2.7%. In 2003 the farmers were less enthusiastic in producing coffee production this was due to the imbalance between the income of each farmer's harvest and the expenses made by the farmers and the lack of maintenance on the coffee plants.

The occurrence of the climate crisis in Indonesia and the many natural disasters that occurred in 2004 resulted in a decrease in coffee production in 2004 by 2.4%. In 2005 coffee production declined again by 1.08%, this was due to the crisis where coffee production was high in the world market. According to national coffee business players, the agreement to raise coffee prices is difficult to implement because actually the stock or production of coffee both in Indonesia and abroad is difficult to predict, so production reductions must be made to avoid a world coffee crisis. The increase in the area of coffee plantations that occurred in 2006 increased coffee production by 6.52%. In 2007 coffee production decreased by 0.83%, the decline that occurred in 2007 was due to the lack of knowledge of farmers and mostly due to farmers still using traditional systems or lack of technology.

In 2008 coffee export production increased by 3.18%. This is due to the increase in coffee prices so that farmers are increasingly increasing coffee production. In 2009 Indonesia's coffee production decreased by 2.20%, in 2009 there was a lack of support from the government in increasing prices. In 2010 there was an increase in coffee production by 0.21%, an increase in coffee production in 2010 due to an increase in coffee prices in Indonesia. In 2011 there was a decline in production of 6.54%. According to the chairman of the Indonesian Coffee Export Association (AEKI), the decline in coffee production was due to the extreme weather in Indonesia. Then in 2012 Indonesian coffee production increased by 8.23% this is due to the role of the government in assisting farmers in improving coffee quality and the introduction of technology in agriculture.

In 2013 there was a decline in coffee production by 2.22%, according to the chairman of the Indonesian Coffee Export various problems; including low Association (AEKI) conditions at the field level still have crop productivity. In 2014 there was a decline in coffee production by 4.72% with a production of 643,900 tons. And in 2015 again there was a decline in coffee production by 0.69%, in 2015 the high demand for coffee, improving coffee quality in Indonesia and high domestic consumption. The increase in coffee production occurred again in 2017 by 12.3%, before then decreasing again in the following 2 years. In 2020, coffee production increased by 4.28% from the previous year or by 773.4 thousand tons.

According to the International Coffee Organization (ICO), Indonesian coffee consumption has also increased from year to year or an average increase of 5.16 percent per year. In 1990, the amount of coffee consumed domestically was only 74.52 thousand tons, and then grew by an average of 3.04% or to 100.56 thousand tons. Coffee

consumption continues to increase every year with an average growth of 5.77% between 2000 and 2020 or to 300 thousand tons. This increase in coffee consumption was driven by the increase in the population of Indonesia during that period. In addition, there has been a boom in business activities by utilizing coffee as its raw material. If you look at the medium-term trend, both production and consumption will increase, but prices will decrease slightly. From this, the coffee business remains prospective, although it must be done carefully. The increasing demand was also caused by the increasing number of consumers who switched from alcoholic and fizzy drinks to coffee.

the development of coffee prices in the 1990-2020 period experienced instability where in certain years it experienced a sharp decline and in certain years it also experienced a fairly high increase. From 1990 to 2000, international coffee prices experienced a significant fluctuating level. Based on data from ITC (2002), the highest price increase occurred in 1994, which was 112% of the previous year's price. The fluctuations in coffee prices that occur are inseparable from the development of world coffee production, especially the production of Brasilia coffee as the main producer. The increase in coffee prices in 1994 was due to a decline in exports from Brasilia. Meanwhile, the high price of Arabica coffee in 1997 was due to a decrease in export volumes from several exporting countries which experienced a decline in production as a result of the El Nino disaster and because coffee plantations in Brasilia were affected by upas dew (last hit Brasilia in 2000).

From 2000 to 2001 the price of coffee decreased by 28.47%. In 2002 the price of coffee again decreased by 1.2%. In 2003 the price of coffee experienced a fairly good increase of 4.3%. The increase in coffee prices on the international market in 2003 was probably due to high demand, while supply was reduced. In 2004 the price of coffee increased by 25.3%. In 2005 the price of coffee experienced a fairly good increase of 42.7%. The increase in 2005 was probably due to the strengthening of the currency of the major coffee producing countries against the US dollar. In 2006 the price of coffee in the international market decreased by 0.39%. In 2007, coffee prices increased again by 7.9%. In 2008 again there was an increase in coffee prices by 13.1%. In 2009 there was an increase in coffee prices by 2.9%. In 2010 there was an increase in coffee prices from the previous year by 36.23%.

In 2011 the price of coffee experienced a fairly good increase of 38.33%. This is due to the high demand for coffee from coffee importing countries, and the decline in coffee production. In 2012 there was a decline in coffee prices by 31.21%. In 2013 again there was a sharp decline in coffee prices by 25.17%. This is due to the increased production of major coffee-producing countries such as Brazil and Vietnam. In 2014 there was a fairly good increase in coffee prices by 43.81%. This is because of the drought in Brazil, which reduces coffee production in that country, as we know Brazil is a major coffee producing country. In 2015 there was a decline in coffee prices by 20.19%. After 2015, international coffee prices experienced price fluctuations, in 2020, there was a price increase of 15.41 from the previous year which decreased by 1.57 percent.it is clear that the exchange rate of the rupiah against the dollar fluctuates every year. If the analysis is carried out, there is an average depreciation and appreciation between each year of 11.36% from 1990 to 2020. The movement of the exchange rate fluctuates every year, in the early 1990s the exchange rate was in the position of Rp. was too high to reach Rp. 1,950/USD in the following year until in 1997 the exchange rate of the Rupiah against the US Dollar was Rp. 2,909/USD. This increase is due to changes in the economy from year to year. However, in 1998, the exchange rate was at its highest position reaching Rp 10,013/USD this was due to the monetary crisis experienced by Indonesia. After that the exchange rate decreased due to improvement in the economy. It can be seen that in 2000 the exchange rate of the rupiah against the US dollar was Rp. 8,421. In 2001 the rupiah exchange rate against the US dollar depreciated by 21.83% or increased to Rp. 10,260. In mid-2001 there was a transfer of national leadership, which had an impact in 2002, so that market confidence tended to improve which was triggered by the hope that the end of the political crisis could become the foundation for the rise of the Indonesian economy from a prolonged crisis and in 2002 the rupiah appreciated by 9.25 % or at the level of Rp. 9,331 per 1 US dollar. Entering 2003, the rupiah exchange rate again

experienced appreciation, strengthened at the level of Rp. 8,577 per 1 US dollar. The political heat in 2003 was due to the close of Megawati's five-year term. The existence of tensions between political elites triggered poor public expectations of the market, both public and local, resulting in the depreciation of the rupiah exchange rate in 2004 at the level of Rp. 8,938 per 1 US dollar. In 2005 the rupiah exchange rate again depreciated by 8.56%.

Furthermore, from 2016 to 2020, the Rupiah exchange rate against the US Dollar has a fairly sharp depreciation trend, especially in 2020. The Rupiah exchange rate against the US Dollar in the last 5 years has been constant at around Rp. 13,000 to Rp. 14,000/1. Unexpected volatility previously reached Rp 16,449 in April 2020. This was due to the impact of the Covid-19 pandemic which caused anxiety in the world community, which was accompanied by the US Federal Reserve's move to lower interest rates and purchase debt securities. When the Central Banks of each country cannot follow the Fed's policies, the exchange rates of several countries weaken simultaneously. This condition is similar to the global financial crisis in 2008.

Error Correction Mechanism (ECM) modeling is used to determine the effect of coffee production, domestic consumption, coffee export prices, international coffee prices and the exchange rate of the Rupiah against the US Dollar on the export volume of Indonesian Arabica coffee.

Table 2 – Unit Root Test Results

Variables	Level Data		First Difference	
	T-Statistics	Prob.	T-Statistics	Prob.
LNVK	-3.7016	0.0093*	-6.5955	0.0000*
LNPROD	-0.8609	0.7855 ns	-6.9892	0.0001*
LNCONS	-0.3442	0.9065 ns	-4.6438	0.0009*
LNP	-2.1110	0.2420 ns	-4.3240	0.0020*
LNPINT	-1.9669	0.2990 ns	-5.1082	0.0003*
LNEXC	-1.6207	0.4600 ns	-5.6685	0.0001*

*Note: * - Significant at 1% level of significance; ns - Not significant.*

The data stationarity test was carried out to avoid spurious regression (false regression). Table 2 shows the results of stationarity testing at the level and first difference levels. Based on the results of the ADF test, it is known that at the level level all variables are not stationary because they have a p-value of more than 0.05 so that it fails to reject H0 or there is a unit root. While the results of the stationarity test at the first difference show that all variables are stationary at the first difference. This can be seen from the p-value which is less than 0.05 so the decision is to reject H0. So it can be concluded that the data is stationary at the first difference.

Table 3 – Long-term parameter estimation results

Variable	Coefficient	T-Statistics	Prob.
Constant	4.3964	3.2186	0.0035*
LNPROD	0.7011	4.4239	0.0002*
LNCONS	-0.0686	-0.4001	0.6924
LNP	-0.26493	-1.8837	0.0713***
LNPINT	0.3135	2.2525	0.0333**
LNEXC	-0.0180	-0.2489	0.8054

*Note: * - Significant at 1% level of significance; ** - Significant at 5% significance level; *** - Significant at 10% significance level; ns - Not significant.*

After the stationarity test has been carried out, the parameter estimation of the long-term equation is then carried out. Based on the long-term regression results in Table 3, the following equation can be written:

LnVK = 4.3964 + 0.7011 LnPROD - 0.0686 LnCONS – 0.26493 LnPE + 0.3135 LnPINT - 0.0180 LnEXC

Table 4 – Cointegration test results

Variable	T-Statistics	Prob.
ECT	-4.9784	0.0004*

*Note: * - Significant at 1% level of significance.*

Cointegration test was conducted to determine whether there is a long-term relationship between the independent and dependent variables. The cointegration test results in Table 4 show that the p-value of the test statistic is less than 0.05. This means that the ECT variable is stationary at the 5 percent level of significance. Therefore, it can be concluded that there is a cointegration or long-term equilibrium relationship between the independent variables and the dependent variable.

Table 5 – Short-term equation estimation results (ECM model)

Variable	Coefficient	t-stat	Prob.
D(LNPROD)	0.766558*	6.220755	0.0000
D(LNCONS)	-0.301316 ns	-0.724967	0.4769
D(LNCONS(-1))	0.386522 ns	0.976605	0.3404
D(LNPE)	-0.028760 ns	-0.195370	0.8471
D(LNPINT)	0.143545 ns	1.006235	0.3263
D(LNEXC)	-0.090177 ns	-0.781135	0.4439
D(LNEXC(-1))	0.072206 ns	0.663422	0.5146
ECT(-1)	-0.971633*	-4.045995	0.0006
C	-0.012497	-0.340901	0.7367

*Note: *- Significant at 1% level of significance; ** - Significant at 5% significance level; ns - Not significant.*

Short-term equation modeling (ECM Model) was formed for the variables that are not stationary. In addition, it can also find out which variables have a significant effect on the dependent variable in the short term. This model can be formed if there is cointegration in the long run. Based on the results of the short-term regression (ECM model) in Table 5, the equation can be written as follows.

$$(LnVK) = 0.766558\ (LnPROD)t - 0.301316\ (LnCONS)t + 0.386522\ (LnCONS)t\text{-}1 - 0.028760\ (LnPE)t + 0.143545\ (LnPINT)t - 0.090177\ (LnEXC)t - 0.072206\ (LnEXC)t\text{-}1 - 0.971633\ (ECT)t\text{-}1$$

After estimating the parameters to obtain the ECM model, it is necessary to test the classical assumptions. The test is carried out to ensure that the estimator obtained is BLUE (Best Linear Unbiased Estimator). The assumptions tested were normality, autocorrelation and homoscedasticity. From Table 6 it can be seen that the assumptions of normality, autocorrelation, homoscedasticity have been met.

Table 6 – Classical assumption test results

Assumption Test	P-value	Decision	Information
Normality	0.542571	Failed to Reject Ho	fulfilled
Autocorrelation	0.2114	Failed to Reject Ho	fulfilled
Homoscedasticity	0.9221	Failed to Reject Ho	fulfilled

From the short-term equation, it can be seen that the coefficient value of ECT is -0.971633. This value has met the ECM requirements, namely significant, negative, and less than one. The ECM model also shows that the p-value of the F Statistics is 0.00. The decision from the F-test is to reject H0, with a significance level of 5 percent, it can be concluded that there is at least one independent variable that significantly affects the volume of Indonesian coffee exports.

Partially, with a significance of 5 percent, it can be concluded that the coffee production variable has a positive effect on Indonesia's coffee export supply in the long and short term. This happens because if Indonesia's coffee production increases, the amount of coffee

offered will increase and it can increase Indonesian coffee exports. If there is an increase in coffee production by 1 percent, ceteris paribus, it will cause an increase in Indonesia's coffee export supply by 0.7011 percent. The results of this study are in accordance with research conducted by Elisha C (2015) that in the long term coffee production variables has positive and significant effect on Indonesian coffee exports to the United States. In addition, this is in line with the government's efforts to continue to spur export growth to increase foreign exchange earned by increasing domestic coffee production. Meanwhile, based on the short-term equation, it can be seen that the coffee production variable has a significant influence on the Indonesian coffee export variable at a significant level of 5 percent. Coffee production affects Indonesia's coffee export supply positively in the short term. If coffee production increases by 1 percent, ceteris paribus, it will cause an increase in coffee export supply by 0.7665 percent. This result is supported by research conducted by Rosandi (2007)which states that if there is a change in coffee production, either increasing or decreasing, it will affect the amount of coffee that can be offered for export. In addition, this research Elisha (2015)also strengthens the results of this study that in the short term the coffee production variable has a positive and significant effect on Indonesian coffee exports to the United States as one of Indonesia's coffee export destinations.

Consumption variable has no significant effect on Indonesia's coffee export supply in the long and short term. The non-significance of the domestic consumption variable in the long term is caused by the low public perception of coffee in the domestic market that there is still a coffee production gap/surplus so that it can still be encouraged to increase exports in the long term Meanwhile, in the short term, domestic coffee consumption which does not have a significant effect on Indonesian coffee exports shows that the level of domestic coffee consumption each year does not show an increasing effect on export volume, and vice versa.

Variable has a significant effect on Indonesia's coffee export supply in the long term but has no effect in the short term. In the long term, if there is an increase in coffee export prices by 1 percent, ceteris paribus, it will cause a decrease in Indonesia's coffee export supply by 0.26493 percent. This result is in accordance with research conducted by [13] which states that the export price of agricultural commodities has a negative and significant effect on export demand and tends to be elastic. This causes agricultural products, one of which Indonesian coffee is relatively less competitive in the world market, therefore efforts are needed related to efficiency in coffee farming which will have an impact on price changes. On the other hand, in the short term, coffee export prices are not significant for Indonesian coffee exports due to fluctuations in coffee bean prices in Indonesia which always follow international prices, which causes coffee export prices in the short term to have no significant effect on Indonesian coffee exports in the international market [14]. However, the results of this study are different from the results of research [15] which states that the export price of coffee (FOB price) has a significant effect on the volume of Indonesian coffee exports. This difference in results is probably due to differences in the data analyzed and also due to differences in model specifications.

The international coffee price variable has a significant effect in the long term but does not have a significant effect in the short term. In the long term, the significance of this variable is at the 10 percent confidence level. If there is an increase in international coffee prices by 1 percent, ceteris paribus, it will cause an increase in Indonesia's coffee export supply by 0.3135 percent. This will encourage domestic producers to promote coffee in the international market. This result is in line with research conducted by Maulani and Wahyuningsih (2021) which states that international coffee prices have a positive and significant effect on the value of Indonesian coffee exports. In addition, it Nanda (2019)also produces research which states that one that has a significant positive effect on the value of coffee exports is the international price of coffee, the higher the price of coffee in the international market, the higher the amount offered by sellers Meanwhile, in the short term, the insignificance of this variable is supported by research conducted by Desnky et al. (2018) which states that international coffee prices have no effect on Indonesian arabica coffee exports.

The variable exchange rate of the Rupiah against the US dollar in the long term and in the short term has no significant effect on the supply of Indonesian coffee exports. The ineffectiveness of the Rupiah exchange rate against the US Dollar in the long term is due to the increasing market demand for these commodities, so that when the rupiah exchange rate depreciates or appreciates, it don't cause a significant effect on the amount of coffee demand because coffee has become the most sought after commodity throughout the world, although the price becomes relatively more expensive. This result is also supported by research conducted by which states that changes in the Indonesian exchange rate have no significant effect on coffee exports in each destination country. While the insignificance of these variables in the short term is supported by research conducted Elisha (2015) which states that based on the results of short-term estimates, the variable exchange rate of the rupiah against the United States dollar has no significant effect on Indonesian coffee exports to the United States [9].

Error correction term (ECT) coefficient value is - 0.9716, indicating that the previous period's disequilibrium was corrected in the current period by 0.971633 percent. The error correction term indicates how quickly equilibrium is reached back to long-run equilibrium.

CONCLUSION

Based on the results of the analysis and discussion, it can be concluded that the development of Indonesian coffee exports in 1990-2020 showed fluctuations in the volume, value, and price of Indonesian coffee exports. This condition is influenced by external factors that influence it, such as global economic conditions and domestic policies. Meanwhile, based on the estimation results of the econometric equation, it was found that the supply of Indonesian coffee exports in the short term was significantly influenced by coffee production and the effect was positive. Meanwhile, Indonesia's coffee export supply in the long term is significantly influenced by coffee production and international coffee prices and the effect is positive. Meanwhile, coffee export prices have a significant negative impact on Indonesia's coffee export supply. The policy implication that can be done is to continue to encourage increased coffee productivity so that coffee production can increase through land management such as fertilization and regeneration of coffee plants. In addition, it is necessary to take steps to diversify coffee products so that they can be developed on a SME scale and also on a large scale, considering that coffee processing technology is relatively simple and can be designed in various business scales, so that the added value of this coffee processing product can be enjoyed by coffee processing farmers and also coffee farmer.

REFERENCES

1. Kartika Fatha R 2018 Analysis of Indonesian Coffee Export Demand to the United States Economics Development Analysis Journal, 6.
2. Daya A, Made Astuti Wahyu Utami N, Putra DD and Komala Dewi R 2018 Analysis of Competitiveness and Factors Affecting Indonesian Coffee Exports in the International Market Competitiveness Analysis and Factors Affecting Coffee Exports in the International Market Journal of Agribusiness Management, 6.
3. Ginting CP and Kartiasih F 2019 Analysis of Indonesian Coffee Exports to Asean Countries Scientific Journal of Economics and Business 16 143–57.
4. Desi Ratna Sari ET & Eliza 2013 Analysis of Indonesia's Coffee Export Position in the World Market Title J Chem Inf Model, 53, 1689–99.
5. Putri NH, Sarfiah SN and Septiani Y 2018 Analysis of Determinants of the Value of Indonesian Coffee Exports to the United States Using the Ecm DINAMIC, 6.
6. Sahat SF, Nuryartono N and Hutagaol MP 2016 Analysis of Coffee Export Development in Indonesia, 5.
7. Turnip CE 2002 Analysis of Factors Affecting Export Supply and Trade Flow of Indonesian Coffee [Thesis] (Faculty of Agriculture, Bogor Agricultural University, Bogor).

8. Lubis SN 2002 Impact of Trade Liberalization on the Performance of the Indonesian Coffee Industry and World Coffee Trade [dissertation] (Postgraduate Program, Bogor Agricultural University, Bogor).
9. Elisha CL 2015 Analysis of Indonesian Coffee Exports to the United States Using the Error Correction Model EDAJ. Approach, 4.
10. Rosandi AW 2007 Analysis of Factors Affecting Indonesian Coffee Export Supply.
11. Sihotang J 2013 Analysis of Factors Affecting Indonesian Coffee Exports in the International Market Journal of Economics and Business Nommensen, 4, 9–18.
12. Hidayatullah ADP 2018 Determinants of Indonesian Coffee Exports to Five Main Destination Countries and Comparative Advantages of Indonesian Coffee in International Markets 2005-2015.
13. Lubis AD 2010 Analysis of Factors Affecting Indonesia's Export Performance Trade Research and Development Scientific Bulletin, 4, 1–13.
14. Radar 2021 Analysis of KOPI's Performance and Commodity Prospects Plantation Analysis and Opinion.
15. Widayanti S, Kiptiyah SM and Semaoen MI 2009 Analysis of Indonesian Coffee Exports, Discourse, 12.
16. Maulani RD and Wahyuningsih D 2021 Analysis of Indonesian Coffee Exports on the International Market Pamator Journal, 14, 27–33.
17. 1Nanda Z 2019 Analysis of the influence of Indonesia's GDP, world coffee prices, and the USD - rupiah exchange rate on the volume of Indonesian coffee exports in 1985 - 2017 (Jakarta: Syarif Hidayatullah State Islamic University).
18. 1Desnky R, Syaparuddin and Aminah S 2018 Indonesian coffee exports and the factors that influence it e-Journal of Trade, Industry and Monetary, 6, 23–34.