
DETERMINANTS OF COFFEE EXPERTS OF BANDAR LAMPUNG PROVINCE IN THE INTERNATIONAL MARKET FOR THE PERIOD 2004-2022

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ABSTRACT

This research aims to analyze the influence of Bandar Lampung province's coffee exports in the long and short term and analyze the competitiveness of coffee in the international market. This research is research with a quantitative approach. The data collection technique uses time series data totaling 70 quarters. The analysis technique uses the Error Correction Model (ECM) with prerequisite tests, namely the classical assumption test, stationarity test, cointegration test, ECM test, ECT test, and analysis. Revealed Comparative Advantage (RCA). Research findings show that 1) the rupiah exchange rate influences coffee exports in the long and short term. 2) There is an influence of production on coffee exports in the long and short term. 3) International coffee prices influence coffee exports in the long and short term. 4) Domestic coffee prices influence coffee exports in the long and short term. 5) There is a simultaneous influence of the rupiah exchange rate, production, international coffee prices, and domestic coffee prices on coffee exports, namely 74 percent. 6) The competitiveness of coffee in the international market has a comparative advantage of $R > 1$. The research implies the importance of exchange rate policies, management of production and exports, as well as comparative advantage in international market competition. Continuous improvement in the quality and competitiveness of coffee is crucial for maximizing this potential in the global market.

Keywords: competitiveness, coffee exports, rupiah exchange rate, production, international coffee prices, domestic coffee prices.

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INTRODUCTION

Indonesia is one of the countries that adheres to an open and smallest economic system, so it is said to be a country that is still developing. Therefore, Indonesia does export trade abroad and is not a price maker. Foreign trade is carried out by exporting raw materials, semi-finished goods, and also goods that are ready to use or can be used directly by the country (Nopriyandi & Haryadi, 2017).

Indonesia's economy is increasing because of the role of the agricultural sector, which requires much labor from workers, earns foreign exchange from a country, and contributes to state income (Suwarni et al., 2023). This economic sector also plays a role in providing national food needs; apart from that, the agricultural sector contributes a lot in terms of exports abroad; this can be obtained from looking at the state of the balance of payments and balance of trade, namely surplus receipts obtained from agricultural produce and the existence of import substitution (Nopriyandi & Haryadi, 2017). The highest export value is Singapore, with a value of 456,802 billion USD in 2021; the lowest export value is Indonesia, as listed in the five countries above, amounting to 231,609 billion USD in 2021.

Coffee is a commodity that can increase foreign exchange or income in the country because it has advantages that are very popular with all groups, with this coffee becoming a profitable export

item for buying and selling abroad and coffee being the plantation product that makes the biggest contribution to economic activity. Indonesia. Apart from that, coffee is quite an important foreign exchange earner after gas and oil, so it can be traded openly at home and abroad.

BPS 2020 data shows that America is the country that imports the most Coffee from Indonesia, with a figure of 54,473.7 tons per year in 2020, followed by Malaysia, which imports coffee as much as 36,103.8 tons per year in 2020, also Italy as a European country in 2020 becomes an importing country. The largest coffee from a European country, with an import figure of 27,237.7 per year in 2020. This data shows that the Indonesian coffee market is not only entering the Asian market but can also penetrate and compete in the European and American markets.

The popularity of coffee abroad, such as in Europe and the United States, has made opportunities for the coffee industry very good and increasingly well known, such as Gayo coffee, which comes from Aceh, Mandailing coffee, Lampung coffee, and Bajawa coffee. This coffee was introduced directly by the Minister of Agriculture at the World Coffee Producers Forum (WCPF) in Colombia on Tuesday, July 11, 2017. In this case, more and more people know about Indonesian Coffee, so there are more and more people interested in this coffee.

If we look at the weight side of export value growth in 2013-2018, it experienced a consecutive decline of 28.07 percent, 17.46 percent, and 40.24 percent. Coffee export activities can fluctuate every year; if previously there has been a decline, it can be overcome by increasing coffee production. Therefore, coffee exports increased in 2013, 2015, and 2017 by 19.04 percent, 30.53 percent, 12.57 percent, 28.25 percent, and 5.56 percent, respectively.

International prices and the rupiah exchange rate in an export activity can experience developments that cannot be determined, namely, experiencing uncertain increases or decreases. A high exchange rate will help increase demand for coffee in the global market. However, an increased exchange rate can only sometimes increase Indonesian coffee exports. Meanwhile, increasing international coffee prices does not mean low demand for coffee in the international market, and vice versa. According to data from BPS (2021), Indonesia exported 384.51 thousand tons of coffee to the world, with a total value of 849.37 million dollars.

Based on the description above, it can be concluded that Indonesia can face increasingly high-intensity competitive turmoil in the international market. Wherever the country is, of course, there will be obstacles in every process, but these can be overcome by improving the quality of the commodities traded so that they can contribute to international trade. In this case, coffee as a plantation commodity has the potential to become a superior commodity that can provide the ability to face conditions of trade liberalization.

According to Republic of Indonesia government regulation number 2 of 2009, one of the objectives of exports is to create and release products from regions in Indonesia from land, water, and by air to be sold to the global market to increase Indonesia's economic growth. The aim of coffee exports is also to open new markets overseas so that Indonesian products can spread widely and the economy can be conducive nationally and globally (Amir, 2004). The global market includes trade from various countries and various types of sales, namely coffee. It is one of the export commodities that is very popular with various groups. Indonesia is the third largest coffee exporter in the world, while the largest exporter is Brazilian coffee, and then Vietnam coffee, which is the second largest

coffee exporter. Based on data from the United States Department of Agriculture (USDA), as the third largest coffee in the world, Indonesian coffee is ranked fourth in the nation's fourth largest agricultural product, besides palm oil, coconuts, and rubber. The value of coffee exports is up to 0.88 billion USD, weighing 0.36 million tons.

Indonesia was able to increase its coffee production. However, from 2013 to 2015, it experienced a decline until it produced only 639.4 tons. However, in 2016, Indonesia's coffee production increased yearly until 2022; namely, Indonesia's coffee production reached 794.8 tons per year. Indonesian coffee and world coffee exports in 2018 were obtained from several coffee commodity agencies; some variables are in the table above so that an analysis can be carried out to calculate the competitiveness of coffee in the international market in order to see how the comparative competition for Indonesian Coffee occurs in world sales (can be seen in table 3). The results of the Revealed Comparative Advantage (RCA) Analysis of Indonesian Coffee are $(3.117 > 1)$, which explains that in the 2018 period, Indonesian coffee commodities experienced a comparative advantage in the international market.

The Central Statistics Agency noted that coffee production in Indonesia will reach 794,800 tons in 2022. The amount has increased by 1.10% compared to the previous year, which amounted to 786,191 tons. Indonesian coffee exporters come from several regions which produce coffee typical of their respective regions. One of them is Lampung coffee, which is the second largest national coffee producer after South Sumatra coffee; however, in terms of coffee exports, Lampung is the largest national coffee exporter, so it can provide foreign exchange for the country.

The advantage of Lampung province is that coffee has succeeded in becoming the largest exporter in Indonesia. Lampung coffee beans have been successfully sold on the global market and exported to various countries, namely 65 countries such as Japan, Morocco, Malaysia, Turkey, Georgia, and so on. Coffee exports increased in 2020, namely 156,905 tonnes, and in 2021, they amounted to 96,850 tonnes. This is different from the previous two years, so Lampung Coffee is experiencing an extraordinary increase in becoming a coffee exporter. Lampung coffee exports to various countries totaled 90.2 tons or worth IDR 1.8 trillion, an increase of 63 percent from 2018, which saw a decline in coffee exports on the international market, which only reached 57 tons. Lampung Province exported coffee in 2018 to only 27 countries, which then increased by five countries, so total coffee exports in 2019 increased by five countries, namely to 32 countries that were destinations for Lampung coffee exports. The largest coffee supplier in Indonesia was won by Lampung province, which succeeded in selling coffee to various countries in the world with an average production of 100,000-120,000 tons per year and an area of 163,837 hectares. Lampung province's coffee commodity in 2017-2019 became the second coffee producer in the list of the ten largest national coffee export commodities. Lampung contributed 1.8 trillion of its coffee commodity revenues of 4.3 trillion using Lampung robusta coffee, increasing 41% of the country's foreign exchange. The average frequency of coffee exports was 102 times per month.

According to BPS data, total exports of agricultural commodities in 2020 reached 14.4 billion. Apart from coffee beans, the commodity exported this time was 25 tons of pepper beans worth IDR. 769.8 million destinations in India; 25 tons of grated coconut worth IDR. 387.7 million destinations in Germany; sliced pineapple 35.6 worth Rp. 433 million are destined for China, and 54 tons of

pineapple fruit are worth IDR. 408.9 million Saudi Arabia. Based on data from the Lampung provincial plantation directorate (2020), coffee production in the district area in Bandar Lampung. West Lampung Regency is the largest coffee-producing region, namely 57,930 tons, with a percentage of 49.47%. Then, the Tanggamus district became the second largest production area in Lampung, with coffee production of 34,129 tons and a percentage of 29.15%.

Furthermore, North Lampung Regency totaled 9,961 tons, a percentage of 8.51%. Kanan Regency produces 8,705 coffees, and the percentage is 2.96%. Pesisir Barat Regency produces 3,466 coffees, a percentage of 2.96%. Meanwhile, other regions produce coffee in small quantities, namely 2,900 tons, with a percentage of 2.48%.

One factor that influences exports is the rupiah exchange rate, which means the domestic currency in other countries' currencies. The exchange rate is also a determinant of the success or failure of an export, which will fluctuate every year and determines the profit or loss of a country's exports. Several studies show that certain factors, including the exchange rate, can affect exports. This study concludes that export diversity is positively related to exchange rate depreciation and negatively related to exchange rate volatility. This relationship seems stronger for products with higher technological intensity (Goya, 2020). On the other hand, other research shows that comparative advantage positively impacts exports (Bahar & Rapoport, 2018).

Increasing competitiveness through the exchange rate is a strategy to improve the trade balance, especially in encouraging exports. Apart from that, buying and selling activities nationally and internationally can be carried out using exchange rates. International coffee prices also influence the value of a country's exports because they affect market demand. When world coffee prices rise, market demand will decrease. When international coffee prices fall, market demand for coffee will also increase. The conclusion is that the price of a commodity will influence demand and supply. Therefore, the international coffee price is very suitable to be used as a variable in this research.

Domestic coffee prices will also influence domestic demand for coffee and coffee that will be exported abroad, causing coffee exports to fluctuate yearly and determining conditions in the international and national markets. Domestic consumers also play an important role in coffee sales to stabilize domestic and foreign income. Therefore, domestic coffee prices also influence coffee exports (Azzahra et al., 2023). In carrying out international trade, there is competition between commodities, namely the competitiveness between one country and another to survive in the market. A country has two competitive factors: comparative advantage, which means having a natural advantage, and a created advantage (Tambunan & Wijanarko, 2000). Competitive ability is seen from consumer demand for the goods and the offers made by producers on the attributes consumers need (Sukati et al., 2011). This factor is used to analyze the competitiveness of coffee in maintaining overseas trade.

As for previous research similar to "Non-Tariff barriers and factors that influence the Indonesian cocoa export to Europe," RCA shows that the countries France, Germany, the Netherlands, Spain, the United Kingdom, Bulgaria, and Estonia, which are the main export destinations for cocoa, are certain to have a strong comparative advantage. High means competitiveness in international markets. This research uses the variables of Indonesia's real GDP

per capita and the destination country, destination country CPI, exchange rate, tariffs, and economic distance (Anggoro & Widyastutik, 2016).

Furthermore, research entitled "Export Competitiveness Analysis of Indonesian Coffee the World Market" this research uses the RCA index with Revealed Comparative Advantage (RCA) results; the country studied has a high comparative advantage. The analysis results used are CMSA, proving that the market distribution effect influences Indonesia's competitiveness. This distribution shows a positive value, meaning that Indonesia's competitiveness is very good in attracting coffee exports abroad and has good demand from importing countries (Sari & Tety, 2017).

Previous research entitled "Factors that influence demand for West Sumatran coffee exports to Malaysia" used multiple linear regression methods and RCA and obtained per capita income as factors influenced by demand for West Sumatran coffee exports to Malaysia (Ukrita, 2012). Other research also examines the "Determinants of Indonesian CPO Exports," analyzing it using the Error Correction Model (ECM). The variables used in this research are production and the rupiah exchange rate. The statistical analysis results were that production had a significant positive influence in both the long and short term. In contrast, the rupiah exchange rate significantly negatively influenced the short and long-term (Rosita et al., 2014).

Other research also explains "The influence of production, international coffee prices and exchange rates on the volume of Indonesian tea exports." this research uses multiple linear regression, the results of the research are explanatory research, and the variables studied here have a positive and significant effect on the volume of Indonesian exports. The potential possessed by the Lampung coffee commodity is very large in competing and exporting coffee to the global market, which can increase foreign exchange for the country. This can be seen from the explanation above, which proves that Lampung has contributed to increasing the country's foreign exchange in terms of exporting coffee. This commodity exports coffee every year and has factors that influence it so that it can successfully export coffee, which fluctuates yearly (Sevianingsih et al., 2016).

Researchers obtain factors that influence Lampung coffee exports from supporting journals, often using the variables of the rupiah exchange rate, production, international coffee prices, domestic coffee prices, and the competitiveness of these commodities in the international market. Therefore, the researcher will use the previous research's independent variables and analysis methods in this research. BPS data (2020-2022) shows that Lampung is the province with the largest national export value. The export value obtained in 2021 is 400.6 million dollars or IDR 6 trillion. The export value this year reached 47.2%, which is greater than the previous year.

By looking at how the phenomenon of gaps and research gaps has been explained, the researcher considers that there is a need for follow-up research regarding the problems encountered. The withdrawal of variables is based on previous studies examining similar research. This research uses five independent variables: the rupiah exchange rate, coffee production, international coffee prices, domestic coffee prices, and competitiveness, and one dependent variable, coffee exports. The researcher intends to test the theory and results of previous research using different objects and samples, by collaborating with the previous variables used to measure the coffee export variable as a novelty in this research.

METHOD

This study uses a quantitative approach. The data used in this research is a type of secondary data in the form of quarterly data, which obtained 70-time series data from 2004-2022. Secondary data used in this research was taken using the time series method, where the data was obtained from the Central Statistics Agency (BPS), Bank Indonesia. The Error Correction Model (ECM) regression analysis method is used to analyze the variables that influence coffee exports. The ECM method is used to explain whether the independent variable influences the dependent variable in the short and long term. The analytical tool used to process data in this research is Eviews 12. The prerequisite tests are the classical assumption test, stationarity test, cointegration test, and RCA analysis.

This research uses the Error Correction Model (ECM). The ECM model used has gone through a data stationarity test, cointegration test, classical assumption test, ECT (error correction term) test used to test the influence of independent variables in the short term and long term on the dependent variable, R-Square test, RCA test to determine the power coffee competition. This research analyzes the data obtained, namely the influence of the rupiah exchange rate, domestic and foreign coffee prices, coffee production, and the competitiveness of coffee in the international market using Microsoft Excel and Eviews 12 software. Error Correction Model (ECM) is a model that is used to correct the regression equation between variables that are individually not stationary so that they return to their equilibrium values in the long term (Ajija et al., 2011). This method explains the long-term and short-term relationships of research variables, which are caused by the model's imbalanced relationships and abnormalities and the data's non-stationarity. The Error Correction Model (ECM) method is used to analyze the influence of coffee prices and exchange rates on coffee exports. The estimation results found that coffee prices and exchange rates have a short-term and long-term equilibrium relationship with coffee exports. Based on long-term estimates of the coffee price variable, the exchange rate does not influence the volume of coffee exports. In contrast, in the short term, these three variables influence coffee exports (Nopriyandi & Haryadi, 2017). Revealed Comparative Advantage (RCA) analysis is Revealed Comparative Advantage (RCA) which is used to look in more detail at Indonesian Coffee commodities to compete with other coffee exporting countries in the world market." The basic concept of the RCA method is to measure the comparative advantage of a country's commodities in the international market which is reflected in the value of its exports" (Tresliyana et al., 2015).

RESULTS AND DISCUSSION

Description of Lampung Coffee Export Variables

This data was obtained from the Association of Indonesian Coffee Exporters and Industries (AEKI); the following is a table of Lampung coffee exports:

Table 1. Lampung Coffee Exports

Province	Year	Coffee Exports	Year	Coffee Exports
Lampung	2002	200000	2013	540000
Lampung	2003	290000	2014	390000
Lampung	2004	390000	2015	500000
Lampung	2005	450000	2016	420000
Lampung	2006	420000	2017	470000

Province	Year	Coffee Exports	Year	Coffee Exports
Lampung	2007	330000	2018	280000
Lampung	2008	467000	2019	360000
Lampung	2009	520000	2020	210000
Lampung	2010	450000	2021	350000
Lampung	2011	350000	2022	440000
Lampung	2012	450000		

Source: Secondary Data (processed)

Based on Table 6 above, it can be seen that coffee exports obtained by Lampung province almost every year from 2002 to 2022 have increased from 2002 to 2010; the stability obtained is very profitable for Lampung province. So even though Lampung is the largest national coffee exporter, it also experienced a drastic decline; starting in 2011, coffee bean exports from Lampung Province declined throughout that year due to unfavorable weather and stagnant coffee prices.

Data from the Lampung Regional Association of Indonesian Coffee Exporters and Industries (AEKI) received from the Lampung Province UMKM, Industry, and Trade Cooperative Service stated that Lampung coffee bean exports from January to December 2011 amounted to 195,605 tonnes worth 396.981 million U.S. dollars. This figure decreased by 25.33% compared to 2010 when 261,969 tons were generated, and foreign exchange was worth 392.619 million U.S. dollars.

Based on preliminary figures from the Lampung Province Plantation Service, robusta coffee production in 2011 reached 143,465 tons, including 10 tons of Arabica coffee. Meanwhile, in 2010, robusta coffee production reached 145,009 tons, and arabica reached 16 tons. The coffee plantation area in Lampung is 163,837 hectares, managed by 218,447 farming families. Thus, in 2012, Lampung Province's coffee exports rose again from the previous year because exporters released stock following high demand for robusta coffee beans even though prices had not changed much compared to before.

Table 2. Statistical Description

	D(X)	D(P)	D(NT)	D(IPR)	D(HKD)
Mean	789.4737	-486,382	76.36842	32.17105	-2.18421
Median	-40000	-219	67	121	3
Maximum	190000	22536	1877	2336	814
Minimum	-190000	-23861	-1297	-1808	-621
Std. Dev.	112457.9	9226,878	506.8888	937.9837	340.7884
Skewness	0.119678	0.01454	0.346862	0.011293	0.062843
Kurtosis	1.493788	4.912613	5.134116	2.899236	2.181228

Source: EvIEWS 12 (processed)

Information

X = Exports (USD)

P = Production (USD/Ton)

N.T. = Exchange Rate (USD)

HKI = International Coffee Price (USD)

HKD = Domestic Coffee Price (USD)

Based on the table above, it can be seen that the average value of the export variable is 789.4737; median -40000; maximum 190000; minimum -190000; and standard deviation 112457.9. Then, for the production variable, it shows that the average value obtained is -486.382; median -

219; maximum value is 22536; minimum -23861; and standard deviation is 9226.878. The rupiah exchange rate variable has an average value of 76.36842, a median of 67, a maximum value of 1877, a minimum of -1297, and a standard deviation of 506.8. International coffee prices have an average value of 32.17, a median of 121, a maximum value of 2336, a minimum value of -1808, and a standard deviation of 937.9837. The domestic coffee price variable has an average value of 2.18, a median of 3, a maximum value of 814, and a minimum value of -621. And standard deviation 340.78.

Classic assumption test

a) Normality test

According to (Ghozali, 2016), the normality test is carried out to determine whether the independent and dependent variables have a normal or abnormal distribution in a regression model. The statistical test results will decrease if a variable is not normally distributed. A good regression model is a regression model that has a normal or close to normal distribution so that later, it will be feasible to carry out statistical testing with the following conditions:

1. If the significance value is $>5\%$ (0.05), then the data has a normal distribution.
2. If the significance value is $<5\%$ (0.05), then the data does not have a normal distribution.

In testing the normal distribution, this research uses the Jarque Bera Test, a normality test type of goodness of fit test that measures whether the skewness and kurtosis of the sample conform to the normal distribution. This test is based on the fact that a normal distribution's skewness and kurtosis values are equal to zero. Therefore, the absolute value of this parameter can measure the distribution's deviation from normal. The following is a diagram to see whether the data has a normal distribution or vice versa:

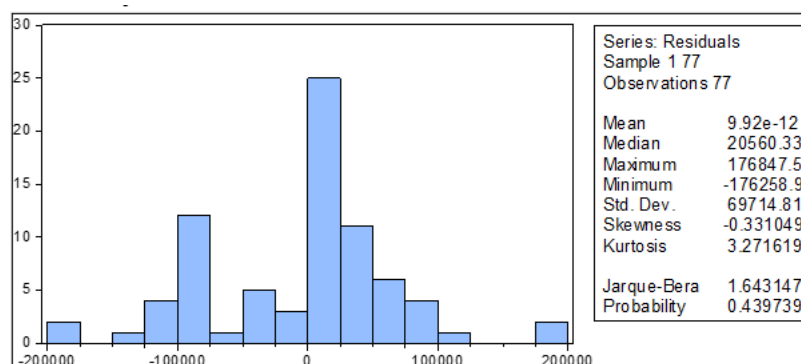


Figure 1. Normality Test

Source: Eviews Processing, 2023

Based on the diagram above, it can be seen that the normality test results show that the jarque fallout value is 1.643147 with a p-value of $0.439739 > \alpha = 0.05$. Hence, the conclusion is that H_0 is accepted that the residuals are normally distributed. So, if the data is normally distributed, it can be assumed that it was taken randomly from a normal population. Data is said to be normally distributed if there are no significant differences.

b) Multicollinearity Test

According to (Ghozali, 2016), The multicollinearity test is used to see whether the regression model finds a correlation between the independent or dependent variables. The results of this multicollinearity test produce high variable values in the sample, which means the

standard error is large; as a result, when the coefficient values are tested, the t-count will be a smaller value than the t-table. A good regression model is without correlation or is free from multicollinearity symptoms. To find out whether there is multicollinearity in the regression model or not, here is the test:

Table 10. Multicollinearity Test

	X	P	NT	IPR	HKD
X	1	0.189842	-0.22434	-0.40902	0.582399
P	0.189842	1	-0.43317	-0.6047	0.367297
NK	-0.22434	-0.43317	1	0.527991	-0.22395
IPR	-0.40902	-0.6047	0.527991	1	-0.28475
HKD	0.582399	0.367297	-0.22395	-0.28475	1

Source: Eviews Processing, 2023

Information:

X = Coffee Exports (USD)

P = Coffee Production (USD/Ton)

N.T. = Exchange Rate (USD)

HKI = International Coffee Price (USD)

HKD = Domestic Coffee Price (USD)

Multicollinearity does not exceed 0.8, which means there is no multicollinearity in the data.

c) Heteroscedasticity Test

According to (Ghozali, 2016), The heteroscedasticity test is used to test whether there is an inequality of variance in a regression model from one study to another. This test is used to determine whether there is heteroscedasticity with the following conditions:

- 1) If the significance value is $>\alpha=0.05$, it can be concluded that there is no heteroscedasticity.
- 2) If the significance value is $<\alpha=0.05$, it can be concluded that there is heteroscedasticity.

The following are the results and discussion of the heteroscedasticity test:

Table 11. Heteroscedasticity Test

F-statistic	2.49992	Prob. F(4.71)	0.0501
Obs*R-squared	9.382453	Prob. Chi-Square(4)	0.0522
Scaled explained SS	6.722899	Prob. Chi-Square(4)	0.1513

Source: Eviews 12 Processing.

Based on the table above, it can be seen that the heteroscedasticity test exceeds the limit value, namely $0.052 > \alpha=0.05$. This means that according to the test's decision-making, there is no heteroscedasticity in the regression model.

d) Autocorrelation Test

A regression model can be good when it is free from autocorrelation. Autocorrelation tests can arise due to sequential observations over time and are related to each other (Ghozali, 2016). This problem arises because the residuals are not independent from one observation to another. The autocorrelation test aims to show the correlation of observation members ordered by time or space (Ajija et al., 2011). The autocorrelation test aims to test whether there is a correlation between confounding errors in period t and errors in period t-1 (previous) in a regression model. If correlation occurs, it is called an autocorrelation problem.

The autocorrelation test aims to determine whether there is a correlation between members of a series of observation data described according to time (time series) or space (cross-section). A good regression model avoids autocorrelation (Suliyanto, 2011). The following is a correlation test carried out on research data:

Table 12 Autocorrelation Test

F-statistic	0.938726	Prob. F(2.13)	0.4161
Obs*R-squared	2.52389	Prob. Chi-Square(2)	0.2831

Source: Eviews 12 Processing.

Based on the autocorrelation test table on the data above, it shows that there are no autoregulation problems in the data because of the prob value. Chi-Square > $\alpha = 0.05$, which means that by accepting H_0 , it can be concluded that there is no autocorrelation.

Stationarity Test

The stationary test must be carried out to achieve the ECM test, which is the main requirement that the data entered must be stationary first to proceed to the next stage.

a) Unit Test Root Test Level level

Table 3. Level Stationarity Test

Variable	Statistics	Prob
Export	-6.71534	0
Rupiah exchange rate	-1.0285	0.0109
Production	-2.6143	0.3071
International Coffee Prices	-3.90745	0.0002
Domestic Coffee Prices	-4.00443	0.0002

Source: Eviews Processing

Based on the table above, in the level stationary test, several variables are not stationary because the probability is more than 5%, so this data is called non-stationary data (Endri, 2008). Then, the next step that must be taken is to carry out a unit root test on the first difference until the data can be stationary. The following is a stationarity test using the ADF (first different) method:

b) Unit Root Test First Different level test

Table 4. Stationarity Test of the ADF (First Different) Method

Variable	Statistics	Prob
Export	-9.56515	0.0000
Exchange rate	-8.14703	0.0000
Production	-14.2401	0.0000
International Coffee Prices	-10.9622	0.0000
Domestic Coffee Prices	-9.03178	0.0000

Source: Eviews Processing

Based on the table above, several variables are not stationary at the level, so looking at them at the first difference level is necessary. The results show that all variables can be stationary under various conditions at the first difference level. The following results of the oner stasis test in First Different Table 14 show that the overall probability of var i able is below 0.05. Because of this, all variables can be said to be static at the First Different level.

Referring to the data stationarity test using the ADF test, as shown in Table 14, the results show that the data used in this study is stationary to the same degree, namely at the first

difference. The data used meets the requirements for application in the ECM model (Rahmat Wibisono, 2010). The next step is to carry out cointegration testing, namely the relationship between variables, which is also a requirement for going to the ECM test after the stationary test; here are the tests:

Cointegration Test

The following are the reviews output results for the Johansen cointegration test, which uses the assumption of linear determinism (intercept and trend). The Johansen cointegration test provides that if the trace statistic or maxeigen value statistic is greater than the critical value at the confidence level $\alpha = 5\%$ and $\alpha = 1\%$, then the test results contain a cointegration equation, which means it has long-term balance.

Table 5. Results of Johansen Fisher Cointegration Test Results

Hypothesized No. of CE(s)	Eigenvalues	Trace Statistics	0.05 Critical Value	Prob.
None *	0.763806	252.3365	88.8038	0
At most 1*	0.641124	146.9901	63.8761	0
At most 2*	0.441605	72.18131	42.91525	0
At most 3*	0.235554	29.64499	25.87211	0.0161
At most 4	0.128458	10.03686	12.51798	0.1255

Source: Eviews 12 Processing

In this study, if the residual is stationary at the level it can be said to have cointegration where the t-statistic value is significant at the value at most 1 and (Prob. 0.0005), which is stationary at alpha $\alpha = 1\%$, then it can be said that the data has cointegration and Between variables have a short-term relationship and a long-term relationship. With the steps that have been carried out and all the steps that have met the requirements, the next step is to carry out an ECM (Error Correction Model) regression analysis.

Error Correction Model (ECM)

The ECM (Error Correction Model) model is used if the data is not stationary at the level level and stationary at the first difference level. This error correction model is a model that can explain the existence of short-term and long-term relationships between variables. The results of the estimated Error Correction Model test are as follows:

Table 6. Error Correction Model Results

Variable	Coefficient	Std. Error	t-Statistics	Prob.
Production	0.574987	0.873295	1.274049	0.0259
Exchange rate	0.334844	4,201258	0.079701	0.0067
International Coffee Prices	-3.245148	9.357311	2.468035	0.0009
Domestic Coffee Prices	15.92562	26.81071	5.940023	0
Constanta	442109.6	137174.5	3.222972	0.0019

Source: Eviews 12 Processing

The regression equation formed:

$$y = a_0 + a_1 x_1t + a_2 x_2t + a_3 x_3t + ut$$

Information:

Y = Lampung Coffee Exports (USD)

X1 = Rupiah Exchange Rate (USD)

X2 = Coffee Production (USD/Ton)
 X3 = Coffee Price (USD)
 ut = Residual Value (previous period)

Then, the regression equation above is entered into the calculation to see the influence of the following variables:

$$y(x) = 18.2681 + 1.01636x_1 - 29.5296x_2 - 0.70857x_3 + 74.1343$$

This means that the exchange rate variable (N.T.), production variable (P) and international coffee price (HKI) and domestic coffee price (HKD) probability values are below the alpha value, which means the production variable is significant to the value of the y variable and r square, meaning this model can explain 74 percent and the probability (F-statistic) is significant and influences variables whose value is 0.0000 is smaller than 0.05.

ECT (Error Correction Term) Test

This test is part of the ECM (Error Correction Model), which is carried out to determine the effect of the model in both the short and long term so that if the probability value of ECT is positive and significant at the 5% significance level, then the model specification can be said to be valid and can explain the variables dependent. The following are the results of the Error Correction Term regression test:

a) Short-Term ECT Regression

Table 7. Short-Term ECT Regression

Variable	Coefficient	Std. Error	t-Statistics	Prob.
Constanta	11.11045	7872,313	0.001411	0.9989
D(Production)	1.416251	0.886268	1.726323	0.0081
D(Exchange Rate)	16,315	15.58248	1.047009	0.0087
D(International Coffee Prices)	-18,1923	8.382401	-2.17029	0.0134
D(Domestic Coffee Prices)	13.18258	23.11561	5.70289	0
ECT(-1)	-1.07981	0.115149	-9.37756	0

Source: Eviews 12 Processing

From the results listed, it can be concluded that there is a short-term relationship between these variables because the probability of the results is smaller than 0.05. Apart from that, based on the Wald Test probability value in the table, namely $0.0000 < 0.05$, it can be interpreted that there is a short-term relationship; all variables affect exports.

b) Long-Term Regression of ECT

Table 8. Long-Term ECT Test

Variable	Coefficient	Std. Error	t-Statistics	Prob.
Production	0.574987	0.873295	1.274049	0.0259
Exchange rate	0.334844	4,201258	0.079701	0.0067
International Coffee Prices	-3.245148	9.357311	2.468035	0.0009
Domestic Coffee Prices	15.92562	26.81071	5.940023	0
Constanta	442109.6	137174.5	3.222972	0.0019

Based on the table above, it can be seen that the rupiah exchange rate variable has a probability of $0.006 < \alpha = 0.05$, which means it has a positive effect in the long term. Next, the production variable has a value of $0.02 < \alpha = 0.05$, meaning it has a positive influence in the long term, and the international coffee price variable has a positive influence in the long term, namely

a value of $0.0009 > \alpha = 0.05$. Meanwhile, the domestic coffee price is $0.0000 < \alpha = 0.05$ and has a positive effect in the long term. It can be concluded that all variables positively influence coffee exports in the long term.

R-Square Test

According to Widarono, the coefficient of determination test (R-Square) is a test to determine the proportion of variation in the dependent variable explained by the independent variable. And this test can also be used to measure how good our regression line is. Test the coefficient of determination to see how big the influence of changes in the independent variables used in the model is to explain the influence on the dependent variable. This test examines the estimated equation's coefficient of determination (R²) value. R-squared can not only be used in regression, but you can use the R-squared formula in all models to determine whether the model is good or not. For example, the model in the time series formula, if you want to use other indicators besides ECM in the time series, you can use R squared as an addition to strengthen the model that has been obtained (Ghozali, 2016). The following are the tests carried out for R-Square in this research:

Table 9. R-Squared Test

R-squared	0.744859	Mean dependent var	380441.6
Adjusted R-squared	0.414018	SD dependent var	93564.15
SE of regression	71622.84	Akaike info criterion	25.25895
Sum squared resid	3.69E+11	Schwarz criterion	25.41114
Log-likelihood	-967.4694	Hannan-Quinn Criter.	25.31982
F-statistic	14.42422	Durbin-Watson stat	2.160853
Prob(F-statistic)	0		

Source: Eviews 12 Processing

The R-Square is 0.744859, which means the variables below influence exports by 74 percent.

Table 10. F Test Statistics

R-squared	0.744859	Mean dependent var	380441.6
Adjusted R-squared	0.414018	SD dependent var	93564.15
SE of regression	71622.84	Akaike info criterion	25.25895
Sum squared resid	3.69E+11	Schwarz criterion	25.41114
Log-likelihood	-967.4694	Hannan-Quinn Criter.	25.31982
F-statistic	14.42422	Durbin-Watson stat	2.160853
Prob(F-statistic)	0		

Source: Eviews 12 Processing

Based on the table above, the statistical F test can be concluded that the probability of the F test being significant together influences variables with a value of 0.0000 smaller than 0.05.

RCA analysis

a) Data analysis

Coffee is a world commodity with the name of Indonesia, especially Java. In world coffee, a cup of coffee is termed a cup of java. Indonesia (especially Java) since the Dutch era has been known as a producer of the best tasting coffee in the world.

As the third largest coffee producer in the world, Indonesian coffee is one of the main ingredients for plantations. In 2023, coffee exports will be ranked as Indonesia's fourth largest agricultural product (especially plantations), after palm oil, rubber and coconuts. Coffee exports were 0.36 million tons, and the export value reached 0.88 billion USD.

The opportunities for the Indonesian coffee industry are very good. With the increasing popularity of Indonesian Coffee, especially in Europe and the United States, specialty coffees such as Gayo coffee, Mandailing coffee, Lampung coffee, and Bajawa coffee. Minister of Agriculture Andi Amran Sulaiman introduced Indonesian coffee ingredients to the world at the World Coffee Producers Forum (WCPF) in Colombia on Tuesday (July 11 2017). In the 2013–2018 period, the growth in the export value of coffee commodities fluctuated every year. In terms of weight, in 2014, 2016 and 2018 exports of this commodity decreased respectively by 28.07 percent; 17.46 percent; and 40.24 percent. However, the export weight of this commodity increased in 2013, 2015, 2017 by 19.04 percent respectively; 30.53 percent; 12.57 percent; 28.25 percent; and 5.56 percent.

When viewed from the value side, coffee commodity exports decreased in 2013, 2014, 2016, 2018 respectively by 6.24 percent; 11.62 percent; 15.88 percent; and 31.35 percent. Meanwhile, the value of coffee exports increased in 2015 and 2017. The highest increase in terms of value occurred in 2017 amounting to 17.47 percent and the value reached US\$1,175.4 million.

The comparative advantage of Indonesian coffee exports with the RCA measure is based on the Ricardian concept of comparative advantage (Moenius, 2006) . RCA measures the share of a country's exports in the same industrial group as other exporting countries, so it is widely used to measure comparative advantage (Serin & Civan, 2008) . The RCA value of Indonesian coffee products exported to the USA is obtained in this analysis. The higher the RCA value, the country has a higher comparative advantage. Meanwhile, if the RCA value is smaller than 1, the country does not have a comparative advantage. The following is comparative data for 2018—2022:

Table 11 Indonesia's Export Value of Commodity i to country j

DATA	Xij				
	2018	2019	2020	2021	2022
Indonesia	2.54	2.53	2.02	1.94	3.19

Based on the data above, Indonesian coffee exports in 2018-2021 decreased to 1.94 in 2021. However, in 2022 there was an increase, namely 3.19.

Table 12. Total Commodity Export Value from All Exporting Countries to Country j

DATA	Xin				
	2018	2019	2020	2021	2022
Total	253.61	249.37	233.59	283.29	324.66

Source: Eviews, 2023 (processed)

Based on the results above, the total export value of all exporting countries to Country J decreased in 2019-2020 by a difference of 15.78. However, the following year saw an increase in export value until 2022 reached a total export of 324.66.

Table 13. Total Export Value of All Indonesian Commodities to Country j

DATA	Xrj				
	2018	2019	2020	2021	2022
Indonesia	1.81	1.74	1.86	2.57	2.23

Source: Eviews, 2023 (processed)

The total export value of all Indonesian commodities to country j increases yearly except in 2019, namely by 1.74. The overall increase in Indonesian commodities in 2022 is 2.23.

Table 14. Total Export Value of All Commodities from Exporting Country to country j

DATA	2018	2019	Xrn 2020	2021	2022
Total	747,000	660,000	625,000	738,000	789,000

Source: EvIEWS, 2023 (processed)

Based on the total export value of commodities from the exporting country to country j above, it can be seen that in 2019 it decreased. However, in 2020-2022 it increased yearly until 2022 the total export value of all commodities reached 789,000.

Information:

X_{ij} = Indonesia's Commodity i Export Value to Country j

X_{in} = Total value of commodity exports from all exporting countries to country j

X_{rj} = Total export value of all Indonesian commodities to country j

X_{rn} = Total export value of all commodities from the exporting country to country j

b) RCA analysis

After obtaining data regarding the variables that will be used in analyzing RCA, the following is the analysis table:

Table 15. RCA analysis 2018-2022

2018	2019	RCA 2020	2021	2022
4133,418411	3848,318	2905.79	1966,499	3476,434

Source: EvIEWS, 2023 (processed)

An analysis of RCA on Indonesian coffee products shows that Indonesian Coffee in the international market has competitiveness as indicated by an RCA value of > 1 every year. It can be further explained that competitiveness fluctuates during the 2018-2022 period as shown in the figure above. Fluctuations occurred in the three export destination countries.

If the RCA value is > 1 , it can be said that a country has a comparative advantage in commodity i. conversely, if $RCA < 1$, then the country does not have a comparative advantage in commodity i.

The Influence of Production Variables, International Coffee Prices, Domestic Coffee Prices, Rupiah Exchange Rates Together on Coffee Exports

The production concept states that exported products should have the potential to compete in the global market (Hamdani, 2012). Theory (Soekartawi, 2007) also states that international prices and exchange rates are two factors that influence commodity exports. This research uses tea, which is one of the leading export commodities. Countries often use international prices as a benchmark in international trade. The Rupiah exchange rate against the U.S. Dollar is used to determine prices when exporting.

The Joint Test (F Test) results recorded a sig value. 0.0000 is less than the required significance level of 0.05 (5%), so $0.0000 < 0.05$. This value shows that the production variables (X_1), the rupiah exchange rate (X_2), international coffee prices (X_3), domestic coffee prices (X_4) together influence coffee exports (Y). The determinant coefficient (R^2) results also recorded a result of 74%, where exports were influenced by production, the rupiah exchange rate, international coffee prices and

domestic coffee prices and the remaining 26% was influenced by other independent variables not discussed in the research. This.

The results of this hypothesis support research from Sintawati (2003) which states that production and the exchange rate jointly influence Indonesian exports. Another study by Wirawan, et al (2011) concluded that production and price factors significantly affected Indonesian rubber exports from 1996 to 2010.

The Influence of the Bandar Lampung Coffee Exchange Rate Variable on Coffee Exports in the short and long term

The exchange rate coefficient (X1) has a significance level of 0.0008, less than the specified significance level of 0.05. These results show that the exchange rate variable has a positive and significant effect in the short term. Meanwhile, in the long term, the significance level is 0.006, less than the specified significance level of 0.05.

The results of this research support the theory of (Soekartawi, 2007) which states that the exchange rate is one of the factors that can influence exports. The results of this research also support research conducted by (Lubis et al., 2022) that exchange rates have a positive relationship with the value of coffee exports. Which means that if there is an increase of IDR 1 in the exchange rate it will cause an increase in the value of coffee exports of 67,035 USD assuming *ceteris paribus*.

This research's results align with previous research entitled "Indonesian Coffee Exports and Factors That Influence Them for the Period 2000-2015". This research shows that the rupiah exchange rate significantly affects Indonesian coffee exports. From the calculation results, the t-count value is 2.214365 with a probability of $0.0488 < \alpha = 0.05$. This means that partially the exchange rate has a significant effect on Indonesian coffee exports for the 2000-2015 period (Desnky et al., 2018).

Partial Influence of Production Variables on Coffee Exports

The coffee production variable (X2) has a significance level of 0.008, which means it is smaller than the significance level determined at 0.05. Then the long-term influence is 0.02, which means it is smaller than the significance level, namely 0.05. These results indicate that production variables have a significant effect on coffee exports. Increased production will positively affect export offers (Komalasari, 2009). The greater the amount of coffee production, the greater the supply of coffee exports which can increase coffee exports, and vice versa.

Due to its significant influence, the research results show that coffee exports also increase when production increases. (Hamdani, 2013) explains that the ability of products produced for export should be those with high potential to compete in international markets.

The Influence of International Price Variables on Coffee Exports

The statistical test results show that the probability value is greater than the significant level or ($0.01 < \alpha = 0.05$), so it can be concluded that international price variables in the long term influence coffee exports. Then in the long term it is $0.0009 < \alpha = 0.05$ which international coffee prices influence coffee exports in the long term.

These results support previous research entitled "The influence of the rupiah exchange rate and international coffee prices on the value of Indonesian coffee exports for the 2004-2021 period" showing that the t-table value with degrees of freedom $15 - 3 = 12$ and a real level of 5% is 2.17881.

The calculated t value stated by (Soekartiw, 2005), the greater the difference between prices on the international market and domestic prices, the greater the number of commodities to be exported. Likewise, the balance between export supply and world import demand for a commodity in the world market increases so that if the commodity in the domestic market is stable, the difference between international and domestic prices will be greater. Apart from that, the rise and fall of prices in the world of international trade is caused by the economic conditions of exporting countries, where high inflation in the domestic market will cause prices in the domestic market to rise. Prices in the international market to increase, where international prices are a balance between export supply and The world demand for imports of a commodity in the world market increases so that if the commodity in the domestic market is stable, then the difference between international prices and domestic prices will be greater.

The results of this research are also in line with other research entitled "The Influence of International Prices and United States GDP per Capita on the Value of Indonesian Textile Exports to the United States." This research shows that international prices significantly affect the value of Indonesian textile exports. From the calculation results, the t-count value is 2,555 with a probability of $0.034 < \alpha = 0.05$. This means that partially international prices significantly affect the value of Indonesian textile exports (Gunawan, 2009) .

The Effect of Partial Domestic Coffee Price Variables on Lampung Coffee Exports

The probability value of domestic coffee prices in the short term is 0.000, more than the significance level determined at 0.05. Then, the probability value of domestic coffee prices in the long term is 0.000. These results show that the domestic coffee price variable has a positive and partially significant effect on Bandar Lampung coffee exports in the short and long term.

The results of this research support the research theory of Amirus, et al (2016) that price is a factor that can influence coffee exports, if the price prevailing domestically (domestic) is high, it will result in a decrease in exports and vice versa, if the domestic coffee price is low, that's why will increase coffee exports. This is because if domestic prices are high, coffee farmers prefer to sell coffee domestically rather than exporting abroad and vice versa. This statement is by economic theory, where increasing domestic prices for coffee will reduce exports because domestic prices become relatively more expensive.

This research also supports previous research that domestic coffee prices have a negative and insignificant effect on the volume of Indonesian coffee exports (Ramadhani, 2018). This condition occurs because the country's domestic prices are high, so the country chooses to import a commodity. Therefore, in this case, according to research, an increase in domestic coffee prices will increase coffee exports.

Analysis of the Competitiveness of Coffee in the International market

Competition cannot be avoided in trade, whether on a small, large, domestic or foreign/international scale. On an international scale, a country sometimes has an advantage over other countries in a commodity. How to find out if a country has competitiveness against other countries can be found out using analytical calculations. One analysis that can be used is Revealed Comparative Advantages (RCA). RCA is an analytical method that will be used to determine the

comparative advantage of a country's commodities in the world. A country's higher RCA value of a country indicates that the country has better competitiveness than other countries.

The results of the RCA test obtained were $3476.434 > RCA = 1$, with the value of Indonesian exports I to Country J in 2022 being worth 3.19, total commodity exports from all exporting countries to Country J in 2022 being worth 324.66, Meanwhile, the total export value of commodities from Indonesia to Country J in 2022 is worth 2.23, next is the total export value of all commodities from exporting countries to Country J in 2022 is worth 789,000. This means that Indonesia has a comparative advantage in the international market and has high competitiveness. However, on the other hand, if $RCA < 1$, the coffee commodity has low competitiveness in the international market.

The results above follow research conducted by (Baroh et al., 2014) titled "Competitiveness of Indonesian coffee in the international market." Indonesia's Revealed Comparative Advantages (RCA) value from 2008-2017 was always positive (more than one). A positive RCA value indicates that Indonesian coffee commodities have a comparative advantage above the world average, or it can be concluded that they have strong competitiveness in the international market.

The results of this research are also in line with previous research entitled "Comparative and Competitive Competitiveness Analysis of Coal Commodity Exports in Three Developing Countries" which showed that the average value of RCA for Indonesia compared to Colombia for fifteen years was $RCA > 1$, which means exports of coal commodities Indonesia is strongly competitive or has a comparative advantage when compared to Colombia (Yulia & Chandriyanti, 2021).

CONCLUSION

In conclusion, the research findings indicate several significant influences on Bandar Lampung coffee exports. The Rupiah exchange rate holds substantial short-term and long-term effects on exports. Additionally, coffee production, international and domestic coffee prices significantly impact exports both in the short and long term. The combined effect of Bandar Lampung coffee production, international coffee prices, Rupiah exchange rate, and domestic coffee prices strongly influences coffee exports, explaining 74 percent of the variance. Notably, the competitiveness of Indonesian coffee exports in the global market is robust, demonstrated by a Revealed Comparative Advantage (RCA) value exceeding 1, signifying a comparative advantage for Indonesian coffee commodities in the international market during the 2022 period.

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