

Analysis of the Determinants of Indonesian Coffee Exports to Malaysia

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ABSTRACT:

This study aims to analyze the development of Indonesian coffee export volume to Malaysia, world coffee prices, the rupiah exchange rate against the ringgit, and Malaysia's real Gross Domestic Product (GDP) during 2014–2023, and analyze the influence of these three variables on the volume of Indonesian coffee exports to Malaysia. The study uses a descriptive quantitative approach with secondary data sourced from the Central Bureau of Statistics, Trade Map, Bank Indonesia, and the World Bank. The analysis was conducted using descriptive analysis and multiple linear regression with the help of SPSS 29. The results show that the volume of Indonesian coffee exports to Malaysia fluctuated during the observation period with an average development of -1 percent. World coffee prices have a positive coefficient and have an effect at the 10 percent significance level, but are not yet significant at the 5 percent level. The rupiah exchange rate against the ringgit has a negative coefficient and does not have a significant effect. Malaysia's real GDP has a negative coefficient and has a significant effect at the 5 percent level. Simultaneously, world coffee prices, exchange rates, and Malaysia's real GDP have a significant effect on the volume of Indonesian coffee exports to Malaysia. The R² value of 0.823 indicates that 82.3 percent of the variation in export volume in the model can be explained by the three independent variables, while the remaining 17.7 percent is explained by factors outside the model. The findings should be read with caution, as the study only used 10 annual observations

Keywords: coffee exports; world coffee prices; exchange rate; real GDP; Malaysia.

1. Introduction

Globalization increases economic interconnectedness between countries through trade, migration, investment, and the flow of goods and services. In an open economy, international trade is a crucial activity because it allows a country to meet needs that cannot be entirely produced domestically while simultaneously generating income from foreign markets. Indonesia, as a country with diverse natural resources, offers significant opportunities in international trade, including through the export of plantation commodities.

Coffee is a commodity with economic value and an international market. Indonesia has a coffee production base spread across various regions and has long served as both a coffee producer and exporter. In the source thesis, Indonesian coffee is positioned as an export commodity with potential for development due to increasing coffee consumption and the international market's demand for Indonesian coffee products.

Malaysia is one of Indonesia's coffee export destinations. Research data shows that Indonesian coffee export volume to Malaysia fluctuated between 2014 and 2023. The volume was recorded

at 29,136 tons in 2014, increasing to 48,521 tons in 2021, then declining to 26,117 tons in 2022 and 22,691 tons in 2023. This pattern indicates that market growth is not linear, making it important to identify economic factors related to changes in export volume.

In addition to export volumes, global coffee prices also fluctuate from year to year. In international trade theory, price is one of the variables related to producers' and exporters' decisions in offering commodities to the international market. Exchange rates are also important because trade transactions involve different currencies. On the other hand, the GDP of the importing country can reflect the economic capacity and purchasing power of the destination market.

Previous research in this thesis shows that coffee export factors can produce different results depending on the destination country, period, and variables used. Afif and Suwali (2022), for example, found that United States real GDP, exchange rates, international coffee prices, and export volume influence the value of Indonesian coffee exports to the United States. Other research reviewed in this thesis also shows variations in the influence of prices, exchange rates, GDP, and production factors on coffee exports.

Based on these conditions, this study focuses on the relationship between world coffee prices, the rupiah exchange rate against the ringgit, and Malaysia's real GDP, with the volume of Indonesian coffee exports to Malaysia. Focusing

on a single destination country provides a more specific context than an aggregate analysis of Indonesian coffee exports. Therefore, this article aims to present the results of the thesis research in a scientific article format, emphasizing the empirical relationship between the variables.

2. Methodology

This study uses a descriptive quantitative approach. The data used is annual secondary data for the 2014–2023 period, resulting in 10 observations. Data sources include the Central Bureau of Statistics for export data, the Trade Map for world coffee prices, Bank Indonesia for exchange rates, and the World Bank for Malaysia's real GDP. Data collection was conducted through documentation of the data available in these sources. The analysis used consists of developmental analysis and multiple linear regression. The regression models used are:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \epsilon$$

Description: Y is the volume of Indonesian coffee exports to Malaysia; α is a constant; β_1 , β_2 , and β_3 are regression coefficients; X_1 is the world coffee price; X_2 is the rupiah exchange rate against the ringgit; X_3 is Malaysia's real GDP; and ϵ is the error. Model testing was performed using the coefficient of determination (R^2), the F-test to determine the simultaneous influence of independent variables, and the t-test to determine the partial influence of each variable. Significance interpretation follows the probability values of the regression results.

3. Results

Development of Research Variables

Year	Exports (tons)	Coffee prices	Exchange rate	real GDP
2014	29,136	3.32	3,629	11,045.6
2015	38,376	2.73	3,437	9,699.9
2016	39,061	2.77	3,211	9,555.7
2017	41,394	2.78	3,115	9,979.7
2018	37,320	2.98	3,528	11,074.0
2019	34,662	3.01	3,414	11,132.1

2020	32,537	3.21	3,469	10,164.3
2021	48,521	3.56	3,454	11,034.6
2022	26,117	2.55	3,377	11,893.2
2023	22,691	3.11	3,345	11,648.7

The volume of Indonesian coffee exports to Malaysia fluctuates. The highest volume during the observation period occurred in 2021, at 48,521 tons, while the lowest volume occurred in 2023, at 22,691 tons. The average growth in export volume, according to the thesis, is -1 percent per year.

Global coffee prices also fluctuate. Prices rose from \$3.32 in 2014 to \$3.56 in 2021, dropped to

\$2.55 in 2022, and then rose again to \$3.11 in 2023. The average price growth in the thesis was 0.34 percent. The rupiah exchange rate against the ringgit fluctuates, with an average growth rate of -0.68 percent. It was recorded at 3,629 in 2014 and 3,345 in 2023. Malaysia's real GDP also fluctuates, with an average growth rate of 0.79 percent.

Multiple Linear Regression Results

Variables	Coefficient B	Std. Error	Beta	t	Sig.
Constant	13,661	2,629	—	5,196	0.002
World coffee prices (X1)	0.778	0.325	0.482	2,394	0.054
Exchange rate (X2)	-0.661	0.798	-0.179	-0.828	0.439
Malaysia's real GDP (X3)	-1,778	0.401	-0.832	-4,431	0.004

Based on the estimation results, the regression equation is:

$$Y = 13.661 + 0.778X1 - 0.661X2 - 1.778X3 + e$$

The global coffee price coefficient of 0.778 indicates a positive relationship. A significance value of 0.054 indicates that the variable is significant at the 10 percent level, but not yet significant at the 5 percent level. The exchange rate

has a coefficient of -0.661 with a significance level of 0.439, thus not showing a statistically significant effect. Malaysia's real GDP has a coefficient of -1.778 with a significance level of 0.004, thus having a significant effect at the 5 percent level.

Model Feasibility

Size	Mark
R	0.907
R ²	0.823
Adjusted R ²	0.734
Standard Error of Estimate	0.03669
F	9,294
Sig. F	0.011

The R^2 value of 0.823 indicates that 82.3 percent of the variation in Indonesian coffee export volume to Malaysia in the sample can be explained by world coffee prices, the exchange rate, and Malaysia's real GDP. The remaining 17.7 percent is attributed to other factors not included in the model. The F-test yielded a value of 9.294 with a significance level of 0.011, indicating that the model is simultaneously significant at the 5 percent level.

4. Discussion

World Coffee Prices and Export Volume

World coffee prices have a positive coefficient of 0.778. The positive direction indicates that the increase in world coffee prices in the model is associated with an increase in the volume of Indonesian coffee exports to Malaysia. However, the significance level of 0.054 is noteworthy: this result meets the 10 percent threshold but falls short of the 5 percent threshold. Therefore, a more appropriate conclusion is that there is statistical evidence at the 10 percent significance level, not the 5 percent level. These findings suggest that changes in world prices may be a factor in coffee export activity. However, because the observation period is only 10 years, these results should be interpreted with caution and should not be used to assert a strong causal relationship.

The exchange rate has a negative coefficient of -0.661 with a significance value of 0.439. This means that in this research model, there is insufficient statistical evidence to indicate a significant effect of the rupiah exchange rate against the ringgit on Indonesian coffee export volume to Malaysia. These results indicate that exchange rate changes alone cannot convincingly explain changes in export volume during the study period. Export volume can also be influenced by other factors not included in the model, such as production, demand, quality, relative prices, trade policies, logistics costs, and market conditions.

Malaysia's Real GDP and Export Volume

Malaysia's real GDP has a negative coefficient of -1.778 and a significance value of 0.004. Thus, Malaysia's real GDP exhibits a negative and significant relationship with the volume of

Indonesian coffee exports to Malaysia in the research model. This negative trend differs from the simple assumption that an increase in the destination country's income always increases demand for an imported commodity. For coffee, this relationship can be influenced by changes in consumption structure, supply sources, relative prices, product substitution, and other trade factors. Because this study used ten annual observations, the negative result is more appropriately viewed as an empirical finding specific to the period and model specifications used, rather than a universal relationship.

Simultaneously, all three independent variables significantly influenced the volume of Indonesian coffee exports to Malaysia. The F-value of 9.294 with a significance level of 0.011 indicates that the combination of world coffee prices, the exchange rate, and Malaysia's real GDP significantly correlated with export volume in the model. Advanced research can also combine quantitative approaches with market studies. Statistical data can be supplemented with information regarding importer behavior, consumer preferences, exporter strategies, and developments in the Malaysian coffee industry. This combination can provide a deeper explanation for the negative GDP findings and the insignificant exchange rate.

Further research can consider other econometric approaches depending on the characteristics of the data. The choice of method should take into account the number of observations, the nature of the data, and the purpose of the analysis. This can improve the accuracy of the analysis without changing the focus of the research. Research can also compare Malaysia with other Indonesian coffee export destinations. This comparison can help determine whether the price, exchange rate, and GDP patterns found in Malaysia are also observed in other destination countries. A comparative approach will broaden our understanding of the characteristics of Indonesia's coffee export market.

Additional variables can be considered to enrich the model. Production factors, acreage, productivity, domestic coffee prices, shipping

costs, trade tariffs, and demand indicators are all possible alternatives. Additional variables should be tailored to data availability and theoretical basis to ensure the model remains focused. Future research could extend the observation period to increase the number of observations. A longer period could provide insight into the stability of the relationship between prices, exchange rates, GDP, and coffee exports. With a larger dataset, researchers could also conduct more comprehensive model testing.

Further Research Directions

These limitations require the research results to be viewed as empirical evidence for a specific period and variable. The findings should not be interpreted as a causal relationship that applies to the entire period or the entire market. Further research is needed to test the stability of the relationship with longer data sets and more comprehensive specifications. The study also used annual data, so changes occurring within a single year could not be observed in greater detail. Higher-frequency data, if available and consistent, could provide a larger number of observations and allow for more detailed analysis of dynamics.

Another limitation is the number of variables used. The model only includes international coffee prices, the rupiah exchange rate against the ringgit, and Malaysia's real GDP. Other factors such as Indonesian coffee production, domestic consumption, transportation costs, coffee quality, trade policies, domestic coffee prices, inventory, and market conditions in competing countries are not included. The main limitation of this study is the limited number of observations, covering only ten years, from 2014 to 2023. With three independent variables and a constant, the residual degrees of freedom are only six. The small sample size can make coefficient estimates more sensitive to changes in the data and limit the generalizability of the results.

Thus, this article's contribution lies in its focus on the relationship between Indonesian coffee exports and Malaysia and the use of three economic indicators over a ten-year period. The results

provide an empirical picture of the direction and significance of each variable within this market context. The negative and significant finding for Malaysia's GDP suggests that the relationship between destination country income and coffee exports may be market-specific. GDP is an aggregate indicator and therefore does not directly reflect demand for coffee from Indonesia. Changes in suppliers, consumer preferences, industry structure, and international trade may provide context that warrants further investigation.

For the exchange rate, this study obtained a negative but insignificant coefficient. This finding indicates that exchange rate changes are not a primary explanation for the volume of Indonesian coffee exports to Malaysia in the sample. Differences in results from other studies may be influenced by the observation period, data type, destination country, and control variables used. The findings on international coffee prices in this study are positive. This trend compares favorably with previous studies that identified price as a key factor in coffee trade. However, this study's results are based on the target country of Malaysia and the period 2014–2023, so the results may not necessarily be consistent with research in other destination countries.

Previous research referenced in this thesis indicates that macroeconomic factors can be related to Indonesian coffee exports. Afif and Suwali (2022) discuss the factors influencing coffee exports to the United States. Desnky, Syaparuddin, and Aminah (2018) discuss Indonesian coffee exports and the factors that influence them. This research provides the basis for analyzing coffee exports using a quantitative approach.

Comparison with Previous Research

Although the model fit is relatively high, it should not be used to infer causal relationships. Regression models describe statistical relationships based on observational data. With only ten observations, the model results should also be treated as contextual findings that require further testing using a longer time period and data set. An R^2 value of 0.907 indicates a high multiple

correlation between the variables in the model and export volume in the sample. An R^2 of 0.823 means that 82.3 percent of the variation in export volume can be explained by the combination of variables used. An adjusted R^2 of 0.734 provides a measure that has been adjusted for the number of predictors and sample size.

The simultaneous significance of the model does not mean that each variable is individually significant. The partial test results actually show differences: price is only significant at the 10 percent level, and the exchange rate is insignificant. Therefore, the results of the F-test and t-test need to be presented separately to avoid misinterpretation. The simultaneous test yielded an F-value of 9.294 with a significance level of 0.011. Because this value is less than 0.05, the overall model is significant at the 5 percent level. This means that the combination of international coffee prices, the rupiah exchange rate against the ringgit, and Malaysia's real GDP significantly correlates with the volume of Indonesian coffee exports to Malaysia in the study sample.

Data Development Analysis 2014–2023

The distinction between general theory and empirical results is an important part of the research discussion. Theory provides a mechanism for constructing hypotheses, while data demonstrate patterns that occur within a specific time period and context. Therefore, research results should be placed within the context of the Indonesia–Malaysia coffee market and not directly generalized to all target countries. The negative GDP coefficient in this study indicates that, in the 2014–2023 sample, an increase in Malaysia's real GDP correlates with a decrease in Indonesian coffee exports to Malaysia after other variables are accounted for. This result does not imply that Malaysia's economic growth generally reduces coffee consumption. A more accurate interpretation is a negative relationship between Malaysia's GDP indicator and Indonesian export volumes in the model specification used.

Real GDP is used as an indicator of Malaysia's economic condition. Conceptually, a larger

economy reflects greater economic capacity. However, aggregate GDP does not directly reflect the extent of Indonesian coffee consumption. Increases in GDP may be accompanied by changes in consumption structure, supplier changes, preferences, or changes in the composition of imported goods. The insignificance of the exchange rate suggests that coffee export decisions during the study period were not solely determined by exchange rate fluctuations. Exporters and importers could have considered global coffee prices, quality, supply continuity, trade costs, and trade relations. Furthermore, exchange rate fluctuations during the study period were relatively limited compared to changes in export volume, so their partial effect is not yet strongly visible in the model.

The exchange rate is the price of one country's currency compared to another. In international trade, changes in exchange rates can affect the relative prices of goods and exporters' revenues. Theoretically, exchange rate changes can affect the price competitiveness of export products. However, the study results showed a negative coefficient with a significance level of 0.439, making the relationship statistically insignificant. However, the price relationship does not imply that every price increase will immediately lead to an increase in export volume. Trade volume can be influenced by contracts, inventory, coffee quality, production capacity, logistics costs, and buyer decisions. Therefore, the price coefficient results should be understood as an average statistical relationship over the period 2014–2023, not as a mechanism that occurs annually.

Price is a crucial piece of information in international trade decisions. When international prices rise, exporters have the opportunity to earn higher revenues from the sale of their products. Under certain conditions, this increased incentive can encourage product distribution to international markets. The positive price coefficient in this study is consistent with this mechanism. Export demand theory defines exports as demand from consumers or businesses in the destination country for goods produced by the exporting country. In this study,

Indonesian coffee is the product offered to the Malaysian market. Demand for this product is influenced by price conditions, international transaction capabilities, and the economic conditions of the destination country. This framework serves as the basis for explaining why international coffee prices, exchange rates, and Malaysian GDP are used as research variables.

Discussion Based on Export Demand Theory

Overall, the empirical findings indicate that the model is capable of explaining a significant amount of variation in export volumes within the sample, but each variable yields different results. Prices have a positive relationship with statistical evidence at the 10 percent level, exchange rates have a negative but insignificant relationship, while Malaysia's real GDP has a negative and significant relationship. These differences suggest that destination market characteristics need to be considered in understanding Indonesian coffee exports. Malaysia's real GDP has a negative coefficient of -1.778 and a significance value of 0.004. These results indicate a significant negative relationship at the 5 percent level. This finding is crucial for the research because the direction of the relationship contradicts the simple assumption that increased income in destination countries always increases demand for Indonesian coffee exports.

The exchange rate has a negative coefficient of -0.661 with a significance level of 0.439. The negative direction indicates a negative correlation in the model, but the significance level indicates that the partial correlation is insignificant. Therefore, changes in the rupiah exchange rate against the ringgit during the observation period cannot be said to have a strong statistical relationship with the volume of Indonesian coffee exports to Malaysia. Partially, international coffee prices have a positive coefficient of 0.778 with a significance value of 0.054. These results indicate a positive relationship. At the 10 percent significance level, the relationship can be declared significant, while at the 5 percent level, it does not meet the significance threshold. This difference in interpretation is important because articles need to convey the appropriate level of statistical evidence

and not claim that the price variable is significant at all levels of testing.

The coefficient of determination value of 0.823 indicates that 82.3 percent of the variation in the volume of Indonesian coffee exports to Malaysia can be explained by the variables of international coffee prices, the rupiah exchange rate against the ringgit, and Malaysia's real GDP in the research model. Meanwhile, the remaining 17.7 percent of the variation is outside the model. This unexplained portion may be related to other factors not observed in the study, so the R2 value cannot be interpreted as evidence that only these three variables determine exports. The research findings show that the volume of Indonesian coffee exports to Malaysia is related to a combination of several economic conditions, not just a single factor. The model simultaneously incorporates international coffee prices, the rupiah exchange rate against the ringgit, and Malaysia's real GDP. The F-test results indicate that all three variables are jointly significant for export volume at the 5 percent significance level. Therefore, changes in export volume during the study period should be interpreted as the result of the interaction of various economic conditions reflected in the model.

Synthesis of Empirical Findings

The fourth finding is that the model is simultaneously significant with an F of 9.294 and a p of 0.011. An R2 of 0.823 indicates the model's relatively high explanatory power in the sample. However, the small number of observations requires the results to be read as contextual findings and not as general causal conclusions. The third finding is that Malaysia's real GDP has a negative and significant relationship with export volume. A coefficient of -1.778 and a p-value of 0.004 indicate that the relationship is significant at the 5 percent level. This finding is an important empirical finding because it demonstrates the specific characteristics of the destination market that differ from the expected simple positive relationship between income and demand.

The second finding is that the rupiah exchange rate against the ringgit has a negative coefficient of -

0.661, but it is not significant with a p-value of 0.439. Thus, the research data does not provide sufficient statistical evidence regarding the partial relationship between the exchange rate and export volume during 2014–2023. The first major finding is a positive relationship between international coffee prices and the volume of Indonesian coffee exports to Malaysia. A coefficient of 0.778 and a significance level of 0.054 support this relationship at the 10 percent level. However, this result does not reach the 5 percent significance level, so conclusions should be drawn with caution.

Market development can also be achieved by considering product differentiation. Coffee is not a completely homogeneous commodity from a consumer perspective. Differences in origin, quality, processing, and product characteristics can influence buyer choices. These variables were not yet included in the research model and can therefore be the focus of subsequent analysis. Malaysia's negative GDP-to-GDP relationship also suggests that macroeconomic indicators in destination countries need to be complemented with sectoral market information. Aggregate economic growth does not automatically reflect growing demand for Indonesian coffee. Information on processing, consumption, re-trade, and alternative suppliers can help explain changes in export volumes. For policymakers, the insignificant finding regarding the exchange rate suggests that coffee export development requires a broader approach. Competitiveness enhancement policies can be directed at improving productivity, quality, supply chain efficiency, and access to market information. These are general policy implications and not variables directly tested in the model. For businesses, the research findings demonstrate the importance of regularly utilizing market information. International prices can be an indicator in export planning, but decisions should not be based solely on price. Businesses need to consider production capacity, product quality, buyer needs, trade costs, and supply sustainability.

Relevance of Results for Coffee Export Management

From a research perspective, this variation is an important reason to go beyond simply presenting numerical tables. Temporal interpretation helps explain why regression coefficients can differ from the relationships observed across multiple year pairs. Regression provides a measure of the average relationship within a sample, while descriptive analysis helps understand the context in which the data changes.

The decline in volume in 2022 and 2023 also suggests that a price increase in 2023 does not automatically result in an increase in volume. This is consistent with the need to use multiple variables simultaneously. Export relationships are the result of complex economic decisions, so changes in one indicator may be offset by changes in other indicators or factors not included in the model.

The high export volume in 2021 is a key point in the data. That year, the international coffee price also reached 3.56, and Malaysia's GDP was recorded at 11,034.6. However, volumes then dropped sharply in 2022 and again in 2023. This change demonstrates that conditions in one year cannot be used to infer trends over the entire period.

The significant changes in export volumes over the period indicate that Indonesian coffee trade with Malaysia is dynamic. Volumes increase in some years and decrease in others. This dynamic can be influenced by price changes, economic conditions, exporter decisions, importer demand, and trade conditions. The research model captures some of these relationships through three selected variables.

Economic Significance of Export Volume Variations

The GDP coefficient of -1.778 indicates a negative relationship. Assuming other variables remain constant, a one-unit increase in GDP is associated with a 1.778-unit decrease in export volume. A significance value of 0.004 indicates that the relationship is significant at the 5 percent level. Interpretation should be based on the ten-observation annual data set and should not be used as a causal statement.

The exchange rate coefficient of -0.661 indicates a negative trend. Assuming other variables remain constant, a one-unit increase in the exchange rate indicator is associated with a 0.661-unit decrease in export volume. However, because the significance level is 0.439, the relationship is insignificant. Therefore, the coefficient value should not be used to draw strong conclusions about the effect of the exchange rate.

A price coefficient of 0.778 means that a one-unit change in the international coffee price is associated with a 0.778-unit change in export volume, assuming other variables remain constant in the model. This interpretation represents a regression coefficient and does not prove that price changes definitively cause changes in export volume. The significance value of 0.054 is an important consideration in assessing the strength of this relationship.

The regression equation obtained is $Y = 13.661 + 0.778X_1 - 0.661X_2 - 1.778X_3 + \epsilon$. This equation shows the statistical relationship between export volume as the dependent variable and three independent variables. The constant of 13.661 is the predicted value of the model when all independent variables are at zero. In an economic context, the constant is more appropriately viewed as a mathematical component of the model and does not need to be interpreted as an actual economic condition.

Interpretation of Regression Equation

Malaysia's real GDP is used as an indicator of the economic conditions of the destination country. Conceptually, changes in income can influence consumption and demand. However, GDP is aggregate, so the relationship with a single commodity from a single supplier country can vary. The research results provide empirical information on this relationship in the Indonesia–Malaysia coffee market. The exchange rate is used to represent changes in the relative value of the Indonesian and Malaysian currencies. Theoretically, changes in the exchange rate can affect price competitiveness and the value of international transactions. However, this

relationship can be influenced by many other trade decisions. Therefore, this study tests the relationship empirically and does not assume the theoretical direction is definitive.

International coffee prices are seen as being related to exporters' decisions regarding distribution to foreign markets. As prices increase, the potential for export revenue also increases. In this study, this relationship is represented by the price regression coefficient. A positive coefficient indicates a direction of the relationship consistent with theoretical expectations, although the significance level must be differentiated between the 5 percent and 10 percent limits. The research's conceptual framework positions the volume of Indonesian coffee exports to Malaysia as the dependent variable, influenced by three economic variables: international coffee prices, the rupiah exchange rate against the ringgit, and Malaysia's real GDP. The framework is based on international trade theory and demand theory. These three variables were chosen because they represent commodity prices, currency transaction conditions, and the economic conditions of the destination country, respectively.

Final Synthesis of Discussion

When all the research results are read in an integrated manner, it can be seen that the volume of Indonesian coffee exports to Malaysia does not have a simple relationship with a single economic indicator. International coffee prices have a positive trend, the exchange rate has a negative trend with no significance, while Malaysian GDP has a negative and significant trend. This variation shows that each indicator provides different information about the state of trade. Therefore, export analysis requires an approach that considers multiple factors simultaneously. Changes in export volume over ten years also demonstrate that trade conditions can change rapidly. The increase in volume in 2021 was followed by a decrease in the following two years. At the same time, international prices do not always move in line with volume. This descriptive fact suggests that interpretation of the regression coefficients should be placed in the

context of the entire period, rather than based on one or two specific years.

From a methodological perspective, the use of multiple regression allows research to examine the relationship between each variable while considering the other variables. This helps avoid conclusions based solely on the relationship between two variables in isolation. However, regression with ten observations also has limitations. Therefore, the results obtained are more appropriate for use as empirical evidence on the research sample and as a basis for further testing. For the development of economics and international trade, this study demonstrates the importance of distinguishing between theory, statistical relationships, and causal explanations. Theory provides direction for hypotheses, data are used to test these hypotheses, and interpretation must take into account the sample size and available variables. This approach ensures that the article's conclusions are consistent with the evidence obtained from the research.

Ultimately, the Malaysian coffee market can be a crucial area of study for the development of Indonesian coffee exports. The research findings can serve as a starting point for more detailed research on demand structure, competitiveness, quality, supply chain factors, and importer behavior. With additional relevant data and variables, future research could provide a more comprehensive picture of the factors shaping Indonesian coffee export volumes to Malaysia.

Malaysian Market Demand Structure Analysis

Analysis of export determinants relates not only to changes in macroeconomic indicators but also to the characteristics of demand in the destination country. Malaysia is a market geographically close to Indonesia, so theoretically, transaction costs and distance can be important considerations in trade. This geographical proximity does not automatically guarantee increased export volume, as trade decisions are still influenced by price, quality, consumer preferences, consumption patterns, distribution networks, and the exporter's ability to meet market specifications. In the context of this

research, the regression results indicate that the three economic variables used exhibit distinct relationship patterns. International coffee prices have a positive coefficient, the exchange rate has a negative but insignificant coefficient, and Malaysia's real GDP has a negative and significant coefficient. These differences in the direction of the relationships indicate that the coffee export market cannot be understood solely through a single economic indicator. Each variable operates through distinct mechanisms and can interact with market characteristics and trading strategies.

This is crucial because coffee is a commodity that varies by type, quality, origin, processing, and consumer segment. Therefore, changes in a country's GDP do not always result in proportional changes in demand for all coffee types. Increased income can drive changes in consumption composition, brand switching, changes in purchasing channels, or increased demand for products with specific characteristics. Because the study used aggregate data, these mechanisms cannot be directly identified. For Malaysian market development, macroeconomic information should be combined with more specific trade information. Data on exported coffee types, product types, quality, unit prices, shipment volumes, and final destinations can help explain export changes in greater detail. With this approach, macroeconomic research results can serve as a baseline for more targeted market analysis.

Analysis of Price Dynamics and Export Response

International coffee prices are a variable with a positive coefficient of 0.778. This finding indicates that, during the observation period, increases in international prices were associated with an increase in the volume of Indonesian coffee exports to Malaysia, after considering other variables in the model. This relationship can be understood from an economic incentive perspective, as higher prices can increase exporters' potential revenue and encourage them to distribute their products to export markets. However, this positive relationship does not mean that every price increase will always be followed by an increase in

export volume within the same period. Research data shows that there are years when prices and volumes move in opposite directions. In 2022, for example, the world coffee price fell to 2.55, while export volume also fell to 26,117 tons. In 2023, the price rose again to 3.11, but export volume actually fell to 22,691 tons. This pattern suggests that price is one factor, not the sole determinant of changes in export volume.

The significance value of 0.054 should be read with caution. At the 10 percent significance level, world coffee prices can be considered to have a significant relationship with export volume. However, at the 5 percent level, the results do not meet the conventional significance threshold. This distinction is important to note so that interpretation of the results does not exceed the strength of the available statistical evidence. From an export management perspective, international price changes can be used as an indicator in developing sales and production plans. However, export decisions must consider logistics costs, trade contracts, production capacity, product quality, and actual demand in the destination market. Therefore, price information is more appropriate as part of a market monitoring system than as the sole basis for increasing export volume.

Exchange Rate Analysis and Competitiveness

The rupiah exchange rate against the ringgit has a coefficient of -0.661 with a significance value of 0.439. The direction of the coefficient indicates a negative relationship in the model, but the significance value indicates that the relationship lacks sufficient statistical evidence at commonly used levels of significance. Therefore, exchange rate changes cannot be considered a statistically significant factor in determining the volume of Indonesian coffee exports to Malaysia during the study period. The insignificance of the exchange rate can be related to the characteristics of trade using contracts, payment mechanisms, price setting, and business actors' strategies. Exporters can also adjust prices or manage exchange rate risks through various business mechanisms. Since the study does not have data on contracts, payment methods, or exchange rate risk protection, these

explanations should be treated as possibilities, not causal conclusions.

Exchange rate fluctuations in the research data are also relatively limited compared to fluctuations in export volume. The indicator value changed from 3.629 in 2014 to 3.345 in 2023, with some increases and decreases in between. Meanwhile, export volume moved from 29,136 tons in 2014 to 48,521 tons in 2021 and then decreased to 22,691 tons in 2023. These differences in dynamics indicate that volume changes cannot be explained solely by exchange rate fluctuations. The implication is that improving the competitiveness of Indonesian coffee exports requires a broader perspective. Product quality, productivity, supply continuity, logistics efficiency, packaging, certification, promotion, and relationships with importers can all be part of competitiveness. With this approach, export policy is not solely dependent on exchange rate conditions but is directed at strengthening factors that can be controlled by business actors and supporting institutions.

Analysis of Export Resilience and Sustainability

The sustainability of coffee exports is determined not only by the ability to increase volume in a single period, but also by the ability to maintain market access over the long term. Research data shows an increase in volume until 2021 and a decline in 2022–2023. This pattern demonstrates the need for a strategy that focuses not only on increasing quantity but also on sustainable trade relationships and the ability to consistently meet market demand.

In commodity trading, supply continuity is a crucial element because importers require certainty about product availability. Indonesia has a large coffee production base, but variations in productivity, quality, harvest seasons, and distribution can impact the ability to consistently meet demand. Therefore, strengthening the supply chain from producers to exporters can be part of an export-boosting strategy. Sustainability is also related to product quality and differentiation. Coffee with specific characteristics of origin, processing, certification, and quality can target different market

segments. Developing added value through processing and branding can help reduce reliance on price-based competition alone. However, this study has not yet examined the influence of these quality or differentiation factors, so the discussion focuses on conceptual implications.

Thus, the research findings can serve as a basis for strengthening Malaysian market management through a long-term approach. Monitoring of prices and macroeconomic conditions should be complemented by buyer mapping, strengthening distribution networks, improving quality, and developing products. This strategy can enhance exporters' ability to respond to market changes without relying solely on price or exchange rate fluctuations.

Strategic Synthesis of the Indonesian Coffee Export Market to Malaysia

Summarizing all the findings, Indonesian coffee exports to Malaysia during 2014–2023 exhibit dynamics that cannot be explained by a single factor. International prices have a positive trend and are significant at the 10 percent level, the exchange rate has a negative trend but is not significant, while Malaysian GDP has a negative trend and is significant at the 5 percent level. These three results demonstrate that destination market characteristics need to be a key component of trade analysis. Export-boosting strategies should be implemented through a combination of monitoring economic indicators and strengthening non-price factors. International prices provide information on market conditions, while exchange rates can be an indicator of transaction risk. Meanwhile, GDP provides a general overview of the economic conditions of the destination country, but it needs to be complemented by consumption and market structure indicators for more accurate use in export decisions.

From a long-term perspective, increasing competitiveness can be directed at quality, productivity, added value, differentiation, and trade relations. These strategies can help exporters weather periods of unfavorable prices or macroeconomic conditions. Thus, export resilience

is built not only through external conditions but also through the internal capabilities of business actors and the supply chain. Ultimately, this research can serve as a basis for expanding studies on the Malaysian coffee market. Using more detailed data, a longer period, and additional variables could provide a more robust understanding of changes in export volumes. The current research findings serve as a starting point for developing a more comprehensive analysis of the Indonesian coffee trade.

The geographical proximity of Indonesia and Malaysia presents an opportunity to develop coffee trade relations. The relatively close distance can support distribution efficiency compared to more distant markets, although these advantages depend on infrastructure, transportation costs, trade procedures, and logistics networks. Because the study did not measure logistics costs directly, this aspect is an area for further research.

Trade relations can also be strengthened through improved market information and communication between exporters and importers. Information on consumer preferences, market size, product standards, and changes in demand can help exporters adapt their products. Business networks can be strengthened through trade promotions, exhibitions, collaboration between businesses, and the use of international trade platforms. For trade-supporting institutions, mapping the Malaysian market by product segment can help determine development priorities. Macroeconomic information such as GDP remains relevant as a general indicator, but market development decisions should be informed by micro-data on buyers and consumers. This approach can enable more specific and evidence-based business policies and strategies.

Based on all the findings, several priorities can be considered in developing Indonesian coffee exports to Malaysia. The first priority is strengthening market information. Businesses need to regularly monitor international prices, changes in demand, competitor conditions, and Malaysian economic developments. This information can be

used to adjust marketing strategies and supply planning.

The fourth priority is improving human resource capacity and trade institutions. Exporters need skills in contract management, documentation, international payments, quality standards, and risk management. Support from universities, governments, associations, and trade institutions can help provide the necessary training and information. The final priority is the development of a data-driven evaluation system. Export performance needs to be monitored not only by volume, but also by export value, unit price, product diversification, number of buyers, contract sustainability, and market return rates. This approach allows export development strategies to be adjusted to changing market conditions and ongoing evaluation results.

Overall, the discussion shows that Indonesian coffee exports to Malaysia are an economic phenomenon influenced by a combination of market conditions and destination country characteristics. International coffee prices exhibit a positive relationship with export volume, while the exchange rate shows no significant relationship. Malaysia's real GDP, on the other hand, exhibits a negative and significant relationship. These differences demonstrate that economic indicators do not always operate according to simple theoretical assumptions and must be interpreted within the context of specific markets. These findings also reinforce the importance of using research findings as evaluation material, not as the

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sole basis for decisions. Businesses can use international prices and macro indicators as market signals, but they still need to consider actual demand data, quality, logistics costs, supply capabilities, and buyer relationships. An approach that combines quantitative data and market information will provide a stronger foundation for export development.

5. Conclusion

The research results offer several implications for the analysis of Indonesian coffee trade. First, international price dynamics need to be considered, as price is one of the variables that exhibits a positive relationship with export volume during the observation period. Second, the exchange rate did not show a significant partial effect, so coffee export analysis should not focus solely on the exchange rate. Third, the significant negative result of Malaysia's real GDP indicates the need for further study of the characteristics of coffee demand in the Malaysian market and the possibility of changes in supply sources or substitution.

The study's major limitation is the limited number of observations, with only 10 annual data sets, using three independent variables and one constant. Therefore, the residual degrees of freedom are relatively small. Furthermore, the model only incorporates world coffee prices, the exchange rate, and Malaysia's real GDP, while coffee trade can be influenced by many other factors. Therefore, the study's results should not be interpreted as generalizing causal relationships.

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