# DETERMINANTS OF COFFEE COMMODITY EXPORTS AS AN EFFORT OF POST-PANDEMI ECONOMIC RECOVERY COVID-19 IN INDONESIA

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**Abstract**

*This study aims to analyze the factors of gross domestic product, exchange rate, total consumption, and export value on Indonesia's export performance of coffee beans after the Covid-19 pandemic in Indonesia's 14 trading partner countries (Egypt, Italy, the Philippines, Thailand, Belgium, Germany, Japan, Russia, England, China, India, Malaysia, Singapore, and United States of America). This study uses secondary data and Generalized Method of Moment (GMM). Our findings imply that: 1) the variable total consumption shows a positive and insignificant relationship, 2) the variables of GDP, and 3) the exchange rates variable shows a negative and significant relationship with coffee commodity exports, and the variable value of exports shows a negative and insignificant relationship with exports of coffee commodities. Analyzed the factors of gross domestic product, exchange rate, total consumption, and export value on the export performance of Indonesian coffee beans after the Covid-19 pandemic in 14 of Indonesia's trading partners for the last 11 years, namely 2012-2023.*

**Keywords**: Export Development Strategies, Coffee Export, Covid-19, GMM (Generalized Method Of Moment)

**Introduction**

The agriculture, forestry, and fisheries are important in Indonesia's economic activities (BPS, 2020). Its contribution to the gross domestic product (GDP) is significant, around 13.70 percent in 2020. One of the plantation sub-sectors contributes to a GDP of around 3.63 percent, the first order of the agriculture, forestry, and fisheries sectors. In addition, this sub-sector is the provider of industrial raw materials, labor absorbers, and foreign exchange earners.

Coffee is one of the commodities from the Indonesian plantation sub-sector that has a somewhat important role in the economy because it is a foreign exchange earner from other countries besides oil and gas. Indonesia is the fourth largest coffee producer in the world after Brazil, Vietnam, and Colombia (Asosiasi Eksportir Kopi Indonesia, 2022). Coffee commodities in Indonesia's plantation subsector are among the top 20 commodities with potential in the world market (International Trade Center, 2020). Through its official page, the International Trade Centre noted that the total export of coffee beans through raw (unbaked) coffee bean commodities amounted to 1,068,563 US$ from 2009 – 2013 (International Trade Centre, 2020). This data shows that coffee exports play a significant role in improving the Indonesian economy. Thus, as a country exporting coffee commodities, Indonesia must be able to compete with other countries to make the commodity the leading choice of importing countries.

Based on Figure 1 the highest export value of Indonesian coffee commodities is to United States, Japan, Germany, and Malaysia. The highest export value to the United States in 2012 was 331,223 US$ but then decreased in 2013 to a value of 207,092 US$. The highest export value to Japan in 2012 with a value of 145,745 US$, but decreased from 2013 to 2017. The highest export value to Germany occurred in 2013 with a value of 122,178 US$, and the lowest value occurred in 2021 with a value of 28,517 US$. The highest export value to Malaysia occurred in 2017 with a value of 86,968 US$ and the lowest value occurred in 2021 with a value of 53,965 US$.

However, Figure 1.1 shows that the development of Indonesia's coffee commodity exports tends to decline. In general, the decline in the export value of coffee commodities is caused by several factors, namely in terms of production, where garden management, harvesting, and post-harvest handling are still inadequate, and not by the provisions because almost all coffee produced in Indonesia is produced by smallholder plantations, which has an impact on the low quality of production (Manalu et al., 2019). Coffee commodity production in Indonesia still uses traditional methods, where farmers make mistakes in the post-harvest picking and handling process (Muzendi, 2014). Most farmers in coffee production centers harvest with a picking

process before the harvest age to produce low quality. In addition, the decline in the development of coffee exports is a result of the implementation of the quota system and the number of competitors, especially from Latin American and African countries.
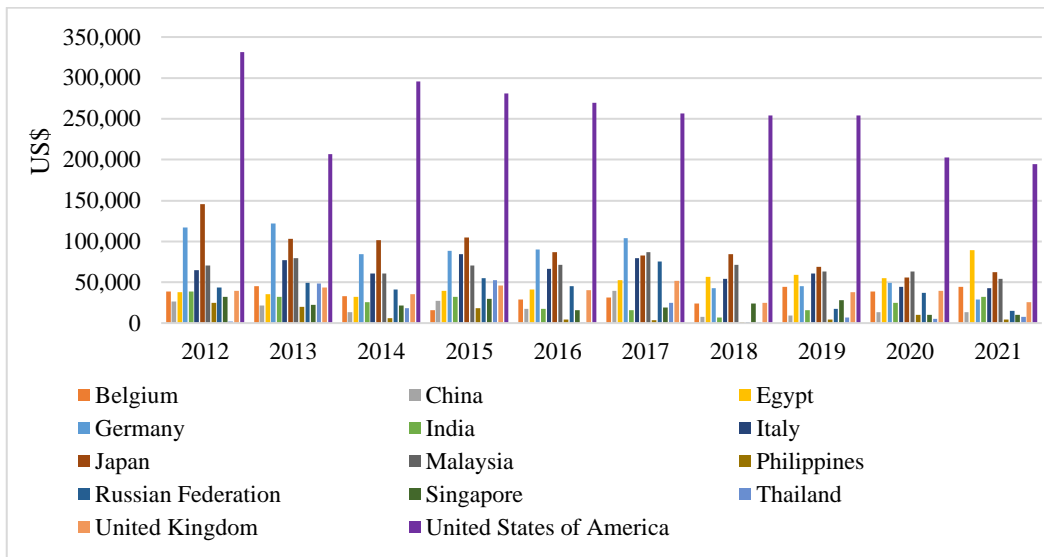


Source: International Trade Centre (2022)

Figure 1. Export Value of Indonesian Coffee Bean Commodities to 16 Trading Partner Countries (in thousand USD)

In 2020, 9 countries experienced a decrease in the value of their exports. The decline occurred, in part due to the COVID-19 pandemic. However, the rate of its decrease does not increase significantly. This demonstrates how high levels of marketing have kept coffee production essentially stable throughout the pandemic. The COVID-19 pandemic has had an impact on economic aspects. Implementing quarantine in various regions on a local and international scale has caused economic growth to stagnate in all sectors (Abidin, 2021). So there is a decrease in productivity due to low demand and the use of transportation as an import and export need. According to Kementerian Keuangan (2020), the COVID-19 pandemic has significantly impacted the global economy. The decline in global demand resulted in a weakening of the prices of various commodities.

The successful development of coffee commodities creates conditions for a more equitable and balanced agricultural society. However, conditions in the field still need to be improved due to an imbalance of market opportunities with the income of coffee farmers coupled with the COVID-19 pandemic conditions, which were able to reduce sales and income from coffee commodities. The novelty of this study is the use of the GMM method, which is relatively new in coffee export research. Several previous studies related to the export of coffee commodities used the Revealed Comparative Advantage (RCA) method, such as the research of Drajat et al. (2007). The next novelty is that this study uses the period 2012–2021, during which the Covid-19 pandemic in 2020–2021 has put pressure on sectors easily affected by fluctuations in coffee prices on the international market and a decline in productivity (Fromm, 2022).

Based on what was said above, the goal of this study is to use the Generalized Method of Moments (GMM) analysis technique to look at the factors that affect the export performance of coffee commodities in Indonesia's 14 trading partner countries. These factors include the destination country's total consumption (import), the exchange rate, the export value, and the GDP. Meanwhile, the bound variable used is the export of coffee commodities to 14 partner countries. The data type used is secondary data in the form of panel data from 2012–2021. The World Bank and the International Monetary Fund (IMF) collected the data.

**Research Method**

This research was conducted on 14 of Indonesia's trading partners namely Belgium, China, Egypt, Germany, India, Italy, Japan, Malaysia, Philippines, Russia, Singapore, Thailand, the United Kingdom, and America. The type of research used is quantitative research with secondary data obtained through the International Trade Centre (ITC) website. This study uses time-series and cross-section data in the form of data on the export value of Indonesian coffee commodities to 14 trading partners during the period 2011 - 2020. This study used the Generalized Method of Moment dynamic panel (GMM) analysis technique. This study used a basic model adopted from the research of Esposito (2017) and Yang & Martinez-Zarzoso (2014) which

was modified by the research objectives. The use of GMM dynamic panel analysis techniques makes it possible to find trade creation and trade diversion in the short and long term with moment analysis with E-Views regression software.

The research model built in this study is total consumption, GDP per capita, exchange rate, and export value which affects the export performance of Indonesian coffee commodities and is analyzed using the GMM technique.

The specifications of the model in this study are as follows.

$$lnEX_{coffee_{ijt}} = \beta0 + lnEX_{coffee_{kt-1}} + \beta_1 lnCON_{ikt} + \beta_2 lnER_{ikt}$$
$$+\beta_3 lnEP_{ikt} + \beta_4 lnGDP_{ikt} + \beta_5 FTA_{ik} + e_{tk}$$

Information:

| | |
|---|---|
| $lnEX\_coffee_{ikt}$ | = The value of Indonesian coffee commodity exports to country k in year t (thousand US\$), in the form of a natural logarithm (ln) |
| $lnEX\_coffee_{kt-1}$ | = The value of Indonesian coffee commodity exports to country k in year t-1 (thousand US\$), in the form of a natural logarithm (ln) |
| $CON_{ikt}$ | = Consumption value of country i and country k in year t (US\$) in the form of a natural logarithm (ln) |
| $ER_{ikt}$ | = Nominal exchange rate of country k against country i in year t (Rupiah), in the form of a natural logarithm (ln) |
| $EP_{ikt}$ | = Price of exported goods of countries i and k in year t (US\$), in the form of natural logarithms (ln) |
| $GDP_{ikt}$ | = GDP Value (Gross Domestic Product) of country k in year t, in the form of a natural logarithm |
| $DFTA_{ik}$ | = Dummy block trades to see trade creation and trade diversion. The dummy variable will be worth 1 if Indonesia's trading partner country is a non-ASEAN-China country and is worth 0 (zero) if it is the other way around. There is a trade creation impact if the coefficient of this variable is positive and significant, and a trade diversion impact if the coefficient of this variable is negative and significant. |
| $t$ | = Time |
| $i$ | = Country of Indonesia |
| $k$ | = 14 partner countries |
| $\beta_0$ | = Parameter |
| $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5$ | = Coefficient |
| $e$ | = error |

## Results and Discussions

The use of generalized methods of moments (GMM) analysis tools can identify in detail and is good at seeing the impact of trade creation and diversion on plantation superior commodity export products. The steps in conducting the GMM analysis are testing the validity and consistency of the instrument. Instrument validity test to identify the validity of the instrument variable whose number exceeds the number of parameters suspected (over-identifying restriction is valid, instrument variable is not correlated with errors). The expected result is that the null hypothesis is not rejected with a significant degree of > 5%.

Table 1. Instrument Validity Test

| Metode | Prob. (J-Statistic) |
|---|---|
| Hipotesis Null (H0): Condition of Moment Valid | |
| Sargan Specification Test | 0,181779 |

Source: EViews 9, 2022

The instrument showed a J-statistical value of 0.181779 based on the validity test. The value is above the level of significance (α). Then, it can be interpreted that in this test, a condition of the moment (the instrument used is valid) has been found.

Table 2. Consistency Test Results

| Test Order | Statistik | Prob. |
|---|---|---|
| AR(1) | NA | NA |
| AR(2) | NA | NA |

Source: EViews 9, 2022

Consistency tests ensure that error terms are not serially correlated in AR(2) so that the estimates obtained are consistent with the null hypothesis that there is no auto-correlation. The expected result is that the

null hypothesis was accepted with a significant rate of > 5% on the test. The value of the coefficient of determination (R-squared) is between zero and one. Based on the test results above, it shows no value.

Table 3. **Unbiased Test**

| Variabel | FD-GMM | FEM | PLS |
|---|---|---|---|
| LOG(COFEEEXPORT(-1)) | -0.291163 | 0.054683 | 0.684629 |
| LOG(GDP) | -1.857442 | -0.357009 | 0.156894 |
| LOG(EXCHANGERATE) | -0.172589 | -0.130721 | -0.013956 |
| LOG(CONSUMPTION) | 0.668984 | 0.341283 | -0.069642 |
| LOG(EXPORTVALUE) | -0.045252 | -0.403622 | -0.011931 |

Source: EViews 9, 2022

Then, an unbiased test was carried out to produce a linear estimator that was not biased with the minimum variant (Best Linear Unbiased Estimator = BLUE) so that there would be no significant regression. The non-habitability test requires that the value of the FD-GMM coefficient is between the FEM and PLS values. The results show that the coefficient value on the FD-GMM test is less than the fem coefficient value, meaning that the unchartedness requirement is not met.

Table 4. **Results of Coffee Commodity Export Performance Analysis**

| Variabel | Nilai | |
|---|---|---|
| LOG(COFEEE XPORT)(-1) | Koef. | -0.291163 |
| | t-stat. | -20.88791 |
| | Prob. | 0.0000 |
| LOG(GDP) | Koef. | -1.857442 |
| | t-stat. | -2.573123 |
| | Prob. | 0.0114 |
| LOG(EXCHANGERATE) | Koef. | -0.172589 |
| | t-stat. | -15.11189 |
| | Prob. | 0.0000 |
| LOG(CONSUMPTION) | Koef. | 0.668984 |
| | t-stat. | 1.190257 |
| | Prob. | 0.2366 |
| LOG(EXPORTVALUE) | Koef. | -0.045252 |
| | t-stat. | -0.123156 |
| | Prob. | 0.9022 |

*** significant α=1%, ** significant α=5%, * significant α=10%
Source: EViews 9, 2022

The table above shows that the Gross Domestic Product (GDP) variable negatively and significantly influences Indonesia's coffee exports at 5% and 10%. The VARIABLE GDP's probability value (p-value) is 0.0114, and the regression coefficient in the variable PDB is negative 1.857442. This means that if GDP increases by 1%, then the value of coffee exports decreases by 1.857442%, assuming other independent variables are constant. A negative regression coefficient indicates that GDP negatively affects the value of coffee exports, which means that the higher the GDP in a country, the lower the value of coffee exports in a country.

The exchange rate shows a negative and significant relationship with Indonesia's coffee export performance at 1%, 5%, and 10%. The exchange rate variable significantly affects the performance of Indonesian coffee exports to ASEAN member countries and non-ASEAN members, with a coefficient value of negative 0.172589. A negative value indicates that a decrease in the exchange rate of 1% will affect the increase in coffee export trade performance by 0.172589%. When the value of the country's currency depreciates, it can also cause goods from abroad to have high or expensive prices, which causes exports. Research conducted by Kumar (Kumar, 2014) shows that depreciation can directly encourage an increase in the volume of exports. This shows that exchange rate fluctuations impact the development of Indonesian coffee exports, especially on prices. Fluctuations in Indonesia's exchange rate have a significant influence on the development of coffee exports.

Total consumption at the coefficient value indicates a positive but insignificant relationship to coffee exports. When there is a 1% increase in consumption in importing countries, it will affect export trade performance by 0.668984%. Consumption variables with a probability value of 0.2366, more significant than the alpha values of 1%, 5%, and 10%, indicate an insignificant relationship. The high level of consumption in the importing country will have an insignificant influence on the growth of coffee exports in the exporting country. The relationship between consumption and positive export developments is unidirectional. The result of Christianto's research (2013) is that a country's total consumption positively impacts the volume of imports and has a significant effect. Positive relations show that if there is an increase in total consumption in a country, the volume of imports will also increase, which will later affect exporting countries.

The variable value of exports has a negative and insignificant influence on the development of coffee commodity exports. The coefficient value of the coffee commodity price index is -0.045252, thus indicating a negative relationship. Based on the coefficient value, there was an increase in the price index of goods, which

caused a decrease in the performance of the coffee export trade by 0.045252%. There is an insignificant relationship between the export value and coffee exports from the probability value of 0.9022, more significant than the alpha values of 1%, 5%, and 10%. The coefficient on this relationship that is negative indicates that there is a reversal relationship. When the value of exports increases in price, it will influence the decline in coffee export performance. This is due to an increase in prices, which will have the effect of a decrease in the demand for these commodities or goods; in other words, there is a decrease in export demand.

## Conclusions

Based on the results of the analysis that has been carried out, conclusions are obtained, namely:

a. In coffee bean commodities, the variable total consumption shows a positive and insignificant relationship. A positive relationship means that an increase in total consumption can improve the export performance of coffee beans. The variable of total consumption affects (positive) on coffee exports, so the government together with exporters need to take the opportunities to meet the increasing consumption of the destination country to improve coffee export performance by collaborating with exporters to research, select and determine the quality standards of plantation commodities that are cold to the destination country so that the results of the research can be a reference for exporters to be able to improve the quality of goods export.

b. The variables of GDP and exchange rates show a negative and significant relationship with coffee commodity exports. The GDP variable negatively affects the value of coffee exports, which means that the higher GDP in a country, the lower the value of the country's coffee exports. The exchange rate variable negatively affects coffee exports, so the government needs to maintain exchange rate stability to make it easier for exporters to determine the selling price and negotiate price offers with potential buyers.

c. The variable value of exports shows a negative and insignificant relationship with exports of coffee commodities. The negative relationship means that an increase in the value of export can decrease the performance of coffee exports.

Recommendations that can be explained are: 1) The governments and exporters need to take advantage of opportunities to meet the increasing total consumption of destination countries, 2) The government needs to maintain the exchange rate stability, 3) Exporters can set competitive prices by international market commodity prices, 4) The government can optimize equity and infrastructure services in the port sector, customs management services, and customs systems, and 5) The governments and exporters need to maximize bilateral and multilateral cooperation with other market share countries such as Malaysia, United States, and Singapore.

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