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Determinants of Export Competitiveness of Coffee Commodities in South Sulawesi

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Abstract

Negotiation and strategic positioning in international trade are crucial for maximizing the economic benefits of agricultural commodities. This study aims to analyze the determinants of the export competitiveness of coffee from South Sulawesi, Indonesia, during the 2010–2024 period. The independent variables examined include coffee production capacity, world coffee prices, and the exchange rate of the Indonesian Rupiah (IDR) against the US Dollar (USD), while the dependent variable is export competitiveness, measured by the Revealed Comparative Advantage (RCA) index. Utilizing an Ordinary Least Squares (OLS) regression model, the findings reveal that the model explains 70.5% of the variance in coffee export competitiveness. Statistically, both coffee production and the exchange rate exhibit a significant negative impact on the RCA index, suggesting structural vulnerabilities related to supply quality and high dependency on imported agricultural inputs. Conversely, world coffee prices do not significantly influence export competitiveness, indicating the position of local exporters as price takers bound by long-term forward contracts. These findings emphasize the urgent need for strategic policy shifts from quantity-oriented agricultural expansion to quality standardization and upstream cost stabilization.

Keywords: **Export competitiveness, Revealed Comparative Advantage, Coffee commodity, World Coffe Prices, Exchange Rate.**

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INTRODUCTION

Coffee is one of Indonesia's leading commodities and has long played a significant role in the structure of national exports. Indonesia is recorded as the fourth-largest coffee producer in the world after Brazil, Vietnam, and Colombia. This position reflects the country's substantial production capacity as well as the significant economic potential of the coffee commodity. The competitiveness of Indonesian coffee lies not only in its production volume but also in the diversity of its varieties and distinctive flavour profiles originating from various coffee-producing regions. These characteristics provide Indonesian coffee with high market value and strong appeal in international markets.

In recent years, Indonesia's coffee export performance has shown relatively positive development. In the first semester of 2025, Indonesia successfully exported approximately 206.7 thousand tons of coffee to major global markets, including the United States, the European Union, Japan, the Middle East, and Southeast Asian countries. This achievement indicates that Indonesian coffee continues to demonstrate strong competitiveness in the global market. In addition to export volume, the value of coffee exports has also increased significantly. Data from Statistics Indonesia show that in 2024, the value of Indonesia's coffee exports reached USD 1.638 billion, representing an increase of approximately 76.33% compared to 2023. This increase suggests that coffee not only contributes to export volume but also generates growing economic value added for the national economy.

The strategic role of coffee in Indonesia's exports can also be observed from its position within the plantation commodity group. Based on export volume data for plantation crops during the period 2021 - 2025, coffee has consistently ranked among the top five exported plantation commodities, although its volume remains substantially lower than primary commodities such as palm oil and rubber. In 2025, coffee export volume reached 428,345.4 tons, reflecting an increase compared to the previous year. Fluctuations in export volume indicate the dynamics of production, global demand, and the influence of international coffee prices.

South Sulawesi Province represents a particularly relevant case for analysis. The province plays an important role in the economy of Eastern Indonesia and contributes to national exports through various commodities. Data from the Central Bureau of Statistics of South Sulawesi indicate that the region's export value during the January - October 2025 period reached USD 1,343.12 million. However, this figure declined by 20.98% compared to the same period in the previous year. This decrease reflects regional export dynamics influenced by various global and domestic economic factors.

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The disparity between the relatively large production potential of coffee in South Sulawesi and its still limited contribution to exports suggests the presence of complex structural challenges. These challenges encompass internal factors such as productivity, quality, and cost efficiency, as well as external factors including international prices, trade policies, and market access.

Based on the foregoing discussion, it can be concluded that although Indonesia at the national level possesses relatively strong coffee competitiveness in the global market, regional export performance particularly in South Sulawesi Province continues to face various challenges. Therefore, this study is considered essential to analyse the determinants of coffee export competitiveness in South Sulawesi Province. The findings are expected to provide evidence-based strategic recommendations for policymakers, business actors, and other stakeholders in strengthening the sustainable global position of South Sulawesi coffee. This study aims to analyze the factors that influence the competitiveness of coffee commodities in South Sulawesi.

RESEARCH METHODS

This study employs a quantitative research design utilizing annual time-series data spanning a 15-year period from 2010 to 2024. The dependent variable is Export Competitiveness, measured via the Revealed Comparative Advantage (RCA) index and transformed into a natural logarithm (LNRCA). The independent variables include Coffee Production, World Coffee Price, and the Exchange Rate. The data were analyzed using an Ordinary Least Squares (OLS) multiple linear regression model to estimate the elasticity of the independent variables against the dependent variable.

$$lnRCA = \beta_0 + \beta_1 lnPROD + \beta_2 lnPCOFE + \beta_3 lnKURS + \varepsilon$$

Where:

RCA = coffee export competitiveness
PROD = production (ton)
PCOFE = world coffee prices (US Dollar)
KURS = exchange rate (IDR to US Dollar)
$\beta_1, \beta_2, \beta_3$ = estimated parameters
ε = error term

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RESULTS AND DISCUSSION

Statistical Overview of the Regression Model

The export competitiveness of coffee commodities in South Sulawesi is influenced by several key factors including production volume, exchange rates, and prices, all of which have been shown to positively and significantly affect export volumes (Santri et al., 2024). The specialty Toraja coffee from South Sulawesi holds a competitive advantage in the global market due to its superior quality and contributes to the long-term welfare of local communities (Husain & Umami, 2023). Despite strong competitiveness, coffee in South Sulawesi exhibits moderate market penetration compared to other leading commodities like nickel and cocoa (Reviane et al., 2022). Institutional coordination and support, particularly from local government agencies, play a strategic role in enhancing Arabica coffee production, though challenges remain due to limited resources and weak inter-agency collaboration (Irmayani et al., 2025).

Production volume, the rupiah-to-US dollar exchange rate, and world coffee prices all influence the export competitiveness of Indonesian coffee, but their effects vary by time frame and region. Coffee production generally has a positive and significant impact on export volume in the long term, while its short-term effect is often insignificant or weaker (Hanan et al., 2025; Ekonomi et al., 2025; Rahman et al., 2024).

The empirical analysis was conducted using the Ordinary Least Squares (OLS) method, yielding a natural logarithmic regression equation designed to interpret the elasticities of the macroeconomic determinants. The estimated equation is formulated as follows:

LNRCA = 11.23355 - 0.676013(LNPROD) + 0.055193(LNPCOFE) - 0.363955(LNKURS)

Table 1. Factors influencing the export competitiveness of coffee commodities in South Sulawesi

Variable	Coefficient	Error Standards	t-Statistic	Prob.
Constant	11.23355***	3.479217	3.228757	0.0080
Production	-0.676013**	0.292254	-2.313097	0.0411
World Coffee Prices	0.055193ns	0.088887	0.620939	0.5473
Exchange Rate	-0.363955***	0.091052	-3.997211	0.0021

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R-squared	0.705050			
F-statistic	8.764805			
Prob(F-statistic)	0.002963			
Information: ***significant at α = 1%		**significant at α = 5%		ns: non-significant

Source: Secondary data analysis, 2026.

Evaluating the goodness-of-fit of this model, the results demonstrate a highly robust statistical foundation. The R-squared value is recorded at 0.705050, which signifies that 70.5% of the variance in the export competitiveness of South Sulawesi coffee can be comprehensively explained by the collective movements in production, world prices, and exchange rates. The remaining 29.5% is attributed to external variables outside the scope of this model, such as global tariffs, geopolitical trade agreements, and specific climatic conditions. Furthermore, the simultaneous F-test confirms the model's validity, with a Prob(F-statistic) of 0.002963, which is significantly below the standard 0.05 alpha threshold. This confirms that the selected independent variables jointly exert a significant influence on the RCA index, establishing a strong premise for a detailed partial analysis.

Regional analyses, such as for Sumatra and Java provinces, confirm that higher production and favorable prices boost exports, while exchange rate depreciation can reduce competitiveness; thus, policies focusing on stabilizing exchange rates, improving production capacity, and managing price volatility are crucial for enhancing Indonesia's coffee export competitiveness (Barus & Sukadana, 2025; Marbun et al., 2025; Azhari et al., 2025).

On a broader scale, Indonesian coffee faces stiff competition internationally, with countries like Vietnam showing higher competitiveness; however, Indonesia maintains comparative advantages in certain markets such as China where economic growth positively influences export potential (Purwawangsa et al., 2024; Andriani et al., 2025). Improving production capacity, product quality, supply chain integration, and innovation capabilities are critical strategies for strengthening the competitiveness of South Sulawesi's coffee industry in both domestic and international markets (Munizu et al., 2024; Dewi et al., 2025; Santri et al., 2024).

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The Paradox of Production and Export Competitiveness

Based on the partial t-test results, the variable of coffee production (LNPROD) exhibits a coefficient of -0.676013 with a probability value of 0.0411 ($p < 0.05$). This finding indicates that coffee production has a statistically significant and negative impact on export competitiveness. Specifically, a 1% increase in coffee production in South Sulawesi is associated with a 0.67% decline in the region's export competitiveness.

This inverse relationship represents a profound paradox that contradicts classical theories of economies of scale, which typically assume that higher output leads to stronger export market penetration. However, this finding strongly aligns with the modern realities of the global specialty coffee market. The negative correlation can be attributed to a severe discrepancy between production quantity and export quality. In recent years, the expansion of coffee plantations in South Sulawesi has often occurred on marginal lands or through suboptimal agricultural practices, resulting in a surge of low-grade or "asalan" commercial beans. While the total tonnage of production increases, these lower-quality beans fail to meet the rigorous physical and cupping standards demanded by premium international buyers in Europe, the United States, and Japan. Consequently, a larger proportion of the region's total coffee output becomes unexportable, thereby diluting the aggregate Revealed Comparative Advantage (RCA) index.

Furthermore, this dynamic is exacerbated by the explosive growth of the domestic coffee shop industry in Indonesia. As local demand for high-quality Arabica and Robusta beans skyrockets, farmers and local cooperatives often find it more lucrative and less administratively burdensome to sell their premium harvests to domestic roasteries rather than navigating the complex web of international shipping, customs, and global certifications. This massive domestic absorption directly strips the export market of its most competitive products, causing the RCA to drop even as overall provincial production hits record highs. This confirms the assertions made by Paramita and Fitrianto (2024), who noted that without aggressive quality standardization, sheer volume growth actively harms a country's comparative advantage.

The Insignificance of World Coffee Prices

International coffee prices often negatively affect export volumes in the short term, especially in sensitive markets like Japan, though this effect may diminish over time (Hanan et al., 2025; Ekonomi et al., 2025). Some studies find that international prices have a positive influence on export volume when considered alone, but combined with

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production and exchange rates, their joint effect on exports can be limited or statistically insignificant (Wati & Setyowati, 2023; Oktoriza, 2023).

The analysis of world coffee prices reveals a positive coefficient of 0.055193, but with a high probability value of 0.5473 ($p > 0.05$). This statistical outcome demonstrates that short-term fluctuations in global coffee prices do not significantly affect the export competitiveness of coffee from South Sulawesi.

This insignificance provides critical insights into the structural behavior of local exporters and their strategic approach to international trade. Firstly, it highlights the undeniable reality that Indonesian coffee exporters, including those in South Sulawesi, operate strictly as "price takers" rather than "price makers." The global benchmark prices are heavily dictated by the massive outputs of agricultural giants like Brazil and Vietnam, traded primarily on the Intercontinental Exchange (ICE). Consequently, local exporters have minimal leverage to adjust their competitive positioning based merely on global price swings.

Secondly, the lack of significant impact is deeply rooted in the mechanics of international business negotiation and contracting. Good negotiation techniques aim to build long-term, stable relationships to avoid future conflicts and financial uncertainties. In the coffee export sector, this is achieved through the widespread use of forward contracts. Exporters and international buyers typically lock in transaction prices and volumes several months, or even a year, prior to the actual harvest and shipment. Because these agreements are legally binding, daily or monthly volatilities in the world coffee market do not alter the pre-agreed export volumes or the immediate revenue streams. Therefore, the RCA index remains relatively insulated from sudden shocks in global commodity pricing, corroborating the findings of Abafita and Tadesse (2021) regarding the rigidities in global agricultural supply chains.

Exchange Rate Vulnerability and Imported Inflation

The rupiah exchange rate shows mixed effects: it can positively affect exports in the short run but tends to have a negative or insignificant impact in the long run, reflecting sensitivity to currency fluctuations (Hanan et al., 2025; Ekonomi et al., 2025; Rahman et al., 2024). Rupiah exchange rate volatility has a significant negative impact on Indonesia's coffee export competitiveness, particularly in the short term. Studies using ARDL and EGARCH models show that fluctuations in the rupiah exchange rate reduce export performance due to increased uncertainty and risk aversion among exporters (Handoyo et al., 2022; Muslima & Kharisma, 2023). While depreciation of the rupiah can increase

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export value by making Indonesian coffee cheaper internationally, high volatility tends to deter exporters and negatively affect export volumes (Azhari et al., 2025; Askia et al., 2025).

The negative effects of exchange rate volatility are more pronounced in exports to certain markets, reflecting sensitivity to currency instability (Handoyo et al., 2022). Some research indicates that stable exchange rates are crucial for maintaining and improving competitiveness, suggesting that policies aimed at stabilizing the rupiah could enhance coffee export performance (Hanan et al., 2025; Muslima & Kharisma, 2023). However, one study found no significant direct effect of exchange rates on export value over a long period, highlighting that other factors like foreign investment and global prices also play important roles (Barsua et al., 2024).

The regression output identifies the exchange rate (LNKURS) as having a coefficient of -0.363955 with a highly significant probability of 0.0021 ($p < 0.05$). This indicates a significant negative relationship: a 1% depreciation of the Indonesian Rupiah against the US Dollar reduces the export competitiveness of South Sulawesi coffee by approximately 0.36%.

This finding presents a compelling counter-narrative to traditional macroeconomic theories, which argue that currency depreciation enhances a nation's competitiveness by making its exports cheaper for foreign buyers. Instead, the negative coefficient exposes a severe structural vulnerability within the upstream agricultural sector of developing nations: the heavy reliance on imported agricultural inputs. While a weaker Rupiah might superficially lower the dollar-price of Indonesian coffee, it simultaneously causes a drastic spike in "imported inflation." The costs of essential farm inputs—such as synthetic fertilizers, high-grade pesticides, modern roasting equipment, and specialized agricultural machinery—skyrocket when the domestic currency loses value.

Faced with these escalating operational costs, smallholder farmers and local cooperatives are often forced to implement aggressive cost-cutting measures. This typically manifests in reduced fertilizer application, delayed pest management, and deferred maintenance of processing equipment. Ultimately, this compromises the health of the coffee trees and degrades the physical and sensory quality of the harvested beans. As the quality deteriorates, the beans are either rejected by international buyers or heavily discounted, leading to a sharp decline in export competitiveness. This finding serves as a stark warning about the fragility of the agricultural supply chain and aligns closely with the empirical observations of Karo and Rozaini (2023), proving that currency volatility is highly detrimental to import-dependent agricultural sectors.

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CONCLUSION

The regression analysis unequivocally demonstrates that both production volume and exchange rate depreciation exert a significant negative impact on export competitiveness. The negative effect of production highlights a critical quality-quantity mismatch, exacerbated by a booming domestic market that absorbs premium beans. Meanwhile, the detrimental impact of a weakening exchange rate exposes the sector's crippling reliance on imported agricultural inputs, which inflates production costs and degrades bean quality. Conversely, global coffee prices do not significantly dictate competitiveness, reflecting the protective yet restrictive nature of forward contracting.

To thrive in the complex working environment of global trade, policymakers and industry stakeholders must pivot their strategies. Agricultural policies must shift focus from mere land expansion to rigorous quality standardization and the adoption of advanced, localized post-harvest technologies. Furthermore, the government must implement strategic interventions to stabilize upstream input costs, potentially through subsidies or domestic manufacturing of fertilizers, to shield farmers from crippling currency fluctuations.

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