JPPIPA 12(5) (2026)

Jurnal Penelitian Pendidikan IPA

http://jppipa.unram.ac.id/index.php/jppipa/index

Non-Tariff Barriers and the Dynamics of Coffee Export Competitiveness: A Comparative Study of Indonesia and Vietnam

Nazla Atikah Hikmatias Nasution[1], Sahara[2*], Novindra[3]

[1] Master student in Agricultural Economics, Faculty of Economic and Management, IPB University, Bogor, Indonesia.
[2] Department of Economics, Faculty of Economic and Management, IPB University, Bogor, Indonesia.
[3] Department of Environmental Resource Economics, Faculty of Economic and Management, IPB University, Bogor, Indonesia.

Received: January 09, 2026
Revised: March 17, 2026
Accepted: May 25, 2026
Published: May 31, 2026

Corresponding Author:
Sahara
sahara@apps.ipb.ac.id

DOI: 10.29303/jppipa.v12i5.14216

Abstract: Indonesia is one of the world's major coffee producers, however its export competitiveness remains relatively weaker and less stable than that of key competitors such as Vietnam. Previous studies on Indonesian coffee exports have largely focused on production and price dynamics, while the role of non-tariff barriers in shaping export competitiveness has received limited attention. This study therefore analyze the impact of non-tariff barriers on the competitiveness of Indonesian and Vietnamese coffee exports in major destination markets. The analysis employs the inventory approach, Revealed Comparative Advantage (RCA), Revealed Symmetric Comparative Advantage (RSCA), Export Product Dynamics (EPD), and the Gravity Model using panel data of key importing countries during 2005-2024 period. The results indicate that Sanitary and Phytosanitary (SPS) measures are the most dominant non-tariff barriers, as reflected by the Frequency Ratio (FR) and Coverage Ratio (CR) indicators, with 17 incident codes regulating a significant share of coffee trade. The results show that Indonesian coffee maintains a comparative advantage, as reflected by RCA values above one and positive RSCA values; however, this advantage is lower and less stable than that of Vietnam. EPD analysis further confirms that Indonesia's coffee exports are predominantly positioned in the lost opportunity, retreat, and falling star quadrants. Moreover, the estimation results indicate that both SPS and TBT significantly reduce the export competitiveness of Indonesian and Vietnamese coffee. These findings suggest that improving compliance with international standards, strengthening certification systems, and enhancing traceability and quality control are essential policy priorities for improving the global competitiveness of Indonesian coffee exports.

Keywords: Ad-valorem equivalent; Coffee export; Evaluation; Market position; Non-tariff barriers

Introduction

International trade has become the main foundation of Indonesia's economic growth, with plantation commodities being one of the vital sectors in generating foreign exchange after petroleum in global trade. One of the most important plantation commodities is coffee. Its strategic position in the national plantation sector means that coffee not only plays a role as a leading export product, but also as an important source of income for farmers, processing businesses, and other parties involved in the supply chain (Yunita, 2021). According to data from Kementerian pertanian (2023) the national coffee industry has absorbed more than 5 million workers directly and indirectly, including farmers, processors, UMKM players, as well as distribution and export workers. Indonesia ranks fourth as the world's largest coffee producer after Brazil, Vietnam, and

How to Cite:
Nasution, N. A. H., Sahara, & Novindra. (2026). Non-Tariff Barriers and the Dynamics of Coffee Export Competitiveness: A Comparative Study of Indonesia and Vietnam. *Jurnal Penelitian Pendidikan IPA*, *12*(5), 213–226. https://doi.org/10.29303/jppipa.v12i5.14216

Colombia, with production reaching more than 774 thousand tons in 2023 (International Coffee Organization, 2022). Most of the production is intended for export.

Coffee export volume trends fluctuated during the 2015-2024 period, with exports peaking in 2015 at around 500 tons and bottoming out in 2018 and 2023 at around 270 tons (TradeMap, 2025). After the decline, exports rose again but did not return to their initial level, indicating instability in the supply chain and international market demand. Other contributing factors include export policies, coffee bean quality, and global competition, as explained by Azis & Irjayanti (2023), which emphasizes the importance of logistics efficiency and production sustainability in maintaining the competitiveness of Indonesian coffee exports. Fluctuations between 2020 and 2024 were also influenced by the impact of the COVID-19 pandemic, which hampered international distribution and trade (Darmanto & Riau, 2023). This pattern reflects instability in Indonesia's coffee export performance.

In the context of developing countries such as Indonesia, international trade provides access to foreign markets, new technologies, and foreign exchange (Matondang et al., 2025). However, international trade is not entirely free from state policy intervention. Many countries still apply protectionist instruments in the form of tariff barriers and non-tariff barriers. Tariff barriers are protectionist instruments commonly used to increase the competitiveness of domestic products. The increase in import prices due to these tariffs makes local products more competitive. Conversely, non-tariff barriers include various regulations that do not involve direct taxes, such as technical standards, quotas, quality certification, and other sanitary or technical policies (Astuti et al., 2023; Gumelar et al., 2020). As global trade tariffs decline due to tariff liberalization within the framework of the WTO and various free trade agreements, many countries are now turning to non-tariff barriers as the main instrument for regulating international trade flows. As emphasized by Chanthavong (2024), after import tariffs decreased significantly, followed by an increase in the use of non-tariff barriers. The results of this study indicate a paradigm shift from tariffs to technical barriers in international trade policy. In the global coffee trade, Indonesia faces fierce competition from major coffee producing and exporting countries, one of which is Vietnam. Intense competition from Vietnam puts pressure on the stability of Indonesia's coffee exports, both in terms of volume and competitiveness in the international market, making it the world's second largest coffee exporter with a market share of around 16-18 percent of total global coffee exports. Meanwhile, Indonesia ranks fifth with a market share of around 6-8 percent (International Coffee Organization, 2022). Their strategic positions in the global coffee supply chain demonstrate the importance of Southeast Asia's role in the global coffee industry, both in terms of production and exports. Indonesia and Vietnam not only compete in terms of production volume, but also share similar export markets. Both countries export coffee to various countries with high demand, and some of their export destinations are identical.

On-tariff barriers are also known as a form of new protectionism, replacing tariff barriers in international trade (Kumar & Bharti, 2020). The non-tariff barriers with the highest number of incidents applied to Indonesian and Vietnamese coffee exports are SPS barriers with 37 incidents and TBT barriers with 25 incidents for Indonesia and 26 incidents for Vietnam. This is in line with Hwang & Lim (2017) and Wood et al. (2019) that SPS and TBT are groups of non-tariff barriers that are often applied in international trade.

A problem often faced by Indonesia is the suboptimal competitiveness of Indonesian coffee in the international market when compared to its competitor, Vietnam. Indonesia's coffee export performance still lags behind Vietnam, as reflected in low export volumes, land productivity, logistics efficiency, and compliance with international quality standards, which are strategic challenges for improving the competitiveness of Indonesian coffee in the global market (Adnan et al., 2022; Siahaan & Affandi, 2023; Suryana et al., 2024; Tampubolon et al., 2023). These non-tariff barriers tend to be more difficult to overcome because they require additional investment in production processes and logistics systems, which not all exporters can afford (Suryana et al., 2023).

Although there have been several studies examining Indonesian coffee exports, most have focused only on production and price aspects, without considering the impact of non-tariff barriers on the competitiveness of Indonesian coffee exports. Therefore, it is important to systematically examine how non-tariff barriers in these five export destination countries affect the competitiveness of Indonesian coffee exports compared to other exporting countries. This issue is crucial in formulating strategies to increase competitiveness and its relationship with non-tariff barriers to Indonesian coffee exports that support the achievement of Sustainable Development Goal (SDGs) 17, namely increasing exports from developing countries (Mashayekhi, 2019).

Method

The overall research framework used in this study is illustrated in Figure 1. The flowchart presents the sequence of analytical steps starting from data collection

and finally the gravity model estimation to examine the impact of non-tariff barriers on coffee export competitiveness.

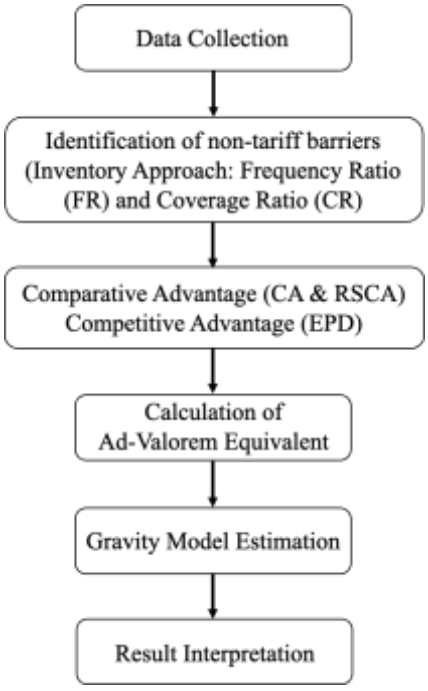


Figure 1. Research methodology flowchart

Data Types and Sources

The type of data used in this study is secondary data consisting of time series data covering the period from 2005 to 2024 and cross-sectional data used is the destination countries for Indonesian coffee exports, namely the United States, Belgium, Malaysia, Japan, and Egypt.

Data Analysis Methods

This study uses five data analysis methods to answer specific research objectives, including the inventory approach, Revealed Comparative Advantage (RCA) and Revealed Symmetric Comparative Advantage (RSCA), Export Product Dynamic (EPD), and Gravity Model.

The Inventory Approach is one of the methods used to analyze the implementation and level of strictness of a country's non-tariff barriers (Hyun & Jang, 2019; Rindayati & Kristriana, 2018). There are two aspects analyzed in the inventory approach, namely frequency ratio (FR) and coverage ratio (CR) UNCTAD (2010) which is written with the following equation.

$$FR_{ijt} = \left[\frac{\sum D_{kt} \cdot M_{kT}}{M_{kT}}\right] \times 100$$
$$CR_{ijt} = \left[\frac{\sum D_{kt} \cdot V_{kT}}{V_{kT}}\right] \times 100 \quad (1)$$

Where: D_{kt} A dummy variable indicating the existence of non-tariff barriers to coffee exports by exporting countries in the year the barrier was imposed, with a value of 1 if there are non-tariff barriers and 0 if there are no non-tariff barriers; M_{kT}= he amount of coffee exports from the exporting country imported by the destination country in year T based on the six-digit HS code;; dan V_{kT} = The value of coffee imports by the destination country in year T.

The comparative advantage of Indonesian coffee exports was analyzed using the RCA method, the results of which indicate the performance and trade patterns of a country's products as described by the relative prices and other non-price factors of traded products. The systematic equation of the RCA method is shown in the following equation.

$$RCA = \frac{(X_{kij}/X_{ij})}{(X_{kwj}/X_{wj})} \quad (2)$$

Where: X_{kij} = value of coffee exports (k) from the exporting country to the destination country (US$); X_{ij}: Total value of exports from the exporting country to the destination country (US$); X_{kwj} : Value of world coffee exports (k) to the destination country (US$); dan X_{wj}: Total value of world exports (w) to the destination country (US$).

The RCA value has a range between 0 and ∞ (Gordeev, 2020). In general, the RCA value has two possibilities: RCA ≥ 1, meaning that the exporting country's coffee has a strong comparative advantage in the international market, while 0 < RCA < 1, meaning that the exporting country's coffee has a weak comparative advantage in the international market (Nurhayati et al., 2019).

Determining a country's comparative advantage using the RCA index has shortcomings, so the RSCA method is applied. Determining the level of competitiveness using RCA also has shortcomings due to the asymmetry of the index results compared to RSCA, which ranges from -1 to 1 and is generally formulated as follows (Laursen, 2015):

$$RSCA = \frac{RCA_t - 1}{RCA_t + 1} \quad (3)$$

The competitive advantage and trade position of Indonesian coffee exports using the EPD method, which serves to identify the level of export dynamics, namely whether a country's coffee exports are experiencing rapid and sustained growth towards the destination country (Meliany et al., 2021). In its calculations, EPD considers two main components: (1) export market share growth, which reflects the competitive strength of products (X-axis), and (2) total export share growth, which illustrates the attractiveness of international

markets (Y-axis) (Meliany et al., 2021; Pratama et al., 2020; Santoso et al., 2022). The mathematical equation for EPD can be seen in the following equation.

$$X-\text{axis} = \frac{\sum_{t=1}^{T}\left(\left(\frac{X_{kij}}{X_{kwj}}\right)_t \text{x } 100\right) - \left(\left(\frac{X_{kij}}{X_{kwj}}\right)_{t-1} \text{x } 100\right)}{T}$$
$$Y-\text{axis} = \frac{\sum_{t=1}^{T}\left(\left(\frac{X_{ij}}{X_{wj}}\right)_t \text{x } 100\right) - \left(\left(\frac{X_{ij}}{X_{wj}}\right)_{t-1} \text{x } 100\right)}{T} \quad (4)$$

The EPD calculation produces four categories of trade positions that can be mapped onto the four trade position quadrants in Figure 2, consisting of quadrant I, the rising star position, indicating dynamic and competitive market share growth for products (fast-growing products); quadrant II, the lost opportunity position, indicating a decline in the market share of previously competitive products, despite dynamic export growth; quadrant III, the retreat position, indicating that the product's market share is no longer competitive and has stagnant growth; quadrant IV, the falling star position, indicating competitive market share, but stagnant export growth (Destiningsih et al., 2020; Immanuel et al., 2019).

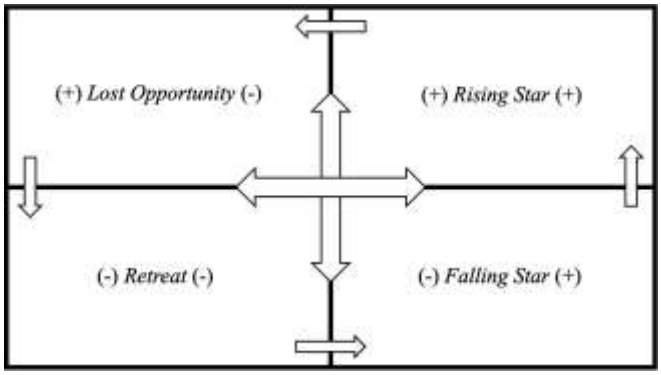


Figure 2. Matrix Export Product Dynamic (EPD) (modified from Esterhuizen (2006)

The ultimate goal is to measure the impact of non-tariff barriers on trade. One approach used is to convert these non-tariff barriers into a form comparable to ad valorem tariffs, through the calculation of Ad Valorem Equivalent (AVE). The equation used in this study refers to research conducted by Kurniasih & Panennungi (2021) and Mao et al. (2023) which uses the following equations.

$$\ln m_{nc} + \varepsilon_n \ln(1 + tar_{nc}) = \alpha_0 + \beta_1 SPS_{nc} + \beta_2 TBT_{nc} + \sum \alpha_{nk} C_c^k + \delta_3 GDP_{nc} + \gamma_4 D_{nc} + \theta_5 NTR_{nc} + U_{1t} \quad (5)$$

Where:

$$\sum_k \alpha_{nk} C_c^k = \alpha_1 \text{AgricultureLand}_{nc}/GDP_{nc} + \alpha_2 \text{Labor}_{nc}/GDP_{nc} + \alpha_3 \text{Capital}_{nc}/GDP_{nc}$$

Descriptions:

m_{nc} : Coffee import value in the destination country (US$)
SPS_{nc} : SPS dummy variable
TBT_{nc} : TBT dummy variable
GDP_{nc} : Real GDP of the destination country in year t (US$)
D_{nc} : Economic distance between the exporting country and the destination country (Km)
NTR_{nc} : Real exchange rate of the exporting country against the currency of the destination country in year t (US$/LCU)
C : Endowment characteristics that characterize the destination country

The next step to obtain the AVE values of SPS and TBT is to change the SPS (β_1) and TBT (β_2) coefficients using the equation formulated by Kee et al. (2009) using import demand elasticity and using $dprice_{nc}$ (domestic price for coffee).

$$\frac{\delta \ln m_{nc}}{\delta \ln SPS_{nc}} = \frac{\delta \ln m_{nc}}{\delta \ln dprice_{nc}} \frac{\delta \ln dprice_{nc}}{\delta \ln SPS_{nc}} = \varepsilon_{nc} AVESPS_{nc} \quad (6)$$

$$\frac{\delta \ln m_{nc}}{\delta \ln TBT_{nc}} = \frac{\delta \ln m_{nc}}{\delta \ln dprice_{nc}} \frac{\delta \ln dprice_n}{\delta \ln TBT_{nc}} = \varepsilon_{nc} AVETBT_{nc}$$

$$AVESPS_{nc} = \frac{1}{\varepsilon_{nc}} \frac{\delta \ln m_{nc}}{\delta \ln SPS_{nc}} = \frac{(e^{\beta_{nc}^{SPS}}) - 1}{\varepsilon_{nc}}$$

$$AVETBT_{nc} = \frac{1}{\varepsilon_{nc}} \frac{\delta \ln m_{nc}}{\delta \ln TBT_{nc}} = \frac{(e^{\beta_{nc}^{TBT}}) - 1}{\varepsilon_{nc}}$$

Where:

β_{nc}^{SPS} : $1 - e^{\beta_1}$
β_{nc}^{TBT} : $1 - e^{\beta_2}$

The impact of non-tariff barriers on the competitiveness of Indonesian and Vietnamese coffee in the markets of the United States, Belgium, Malaysia, Japan, and Egypt can be obtained using coefficient estimates from a gravity model based on research. Darhyati et al. (2017). This study uses the Ad Valorem Equivalent value approach to non-tariff barriers as its independent variable. The model is formulated as follows.

$$RSCAXK_{it} = \alpha_0 + \alpha_1 GDP_i + \alpha_2 GDP_j + \alpha_3 D_{ij} + \alpha_4 NTR_{ijt} + \alpha_5 AVESPS_{ijt} + \alpha_6 AVETBT_{ijt} + U_{2ijt} \quad (7)$$

Descriptions:

$RSCAXK_{it}$: RSCA index of coffee exports from exporting countries in year t

GDP_i : GDP of exporting countries in year t (million US$)

GDP_j : GDP of destination countries in year t (million US$)

D_{ij} : Economic distance between exporting countries and destination countries (km)

NTR_{ijt} : Real exchange rate of the exporting country against the currency of the destination country

$AVESPS_{ijt}$: Ad valorem equivalent value of the destination country's SPS on the exporting country's coffee in year t (%)

$AVETBT_{ijt}$: Ad valorem equivalent value of the destination country's TBT on the exporting country's coffee in year t (%)

Result and Discussion

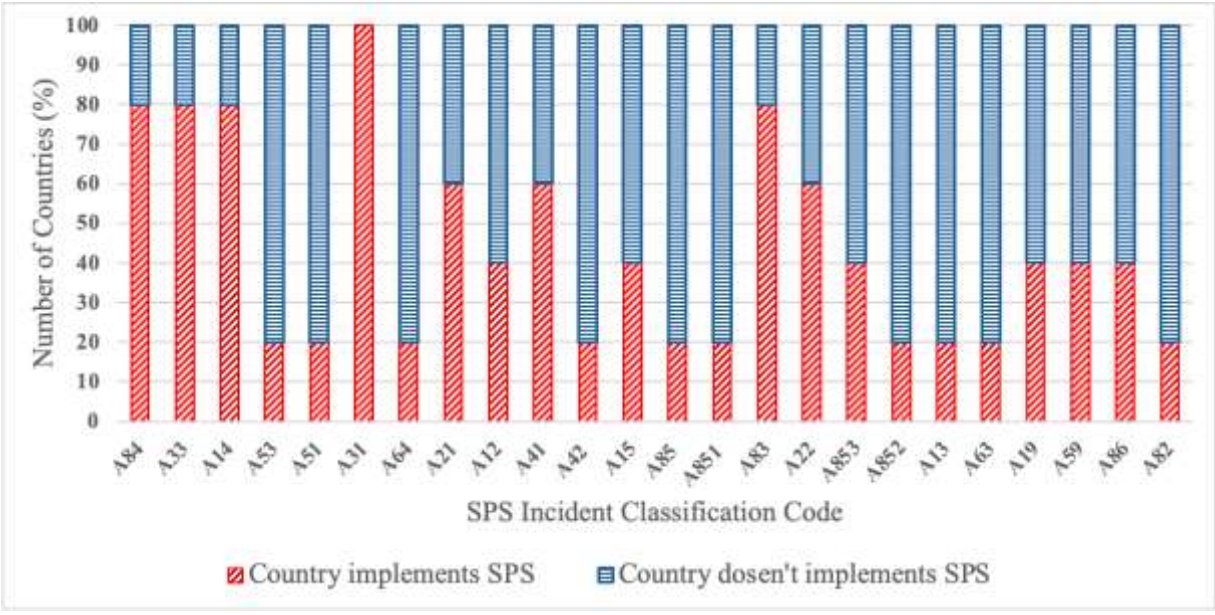
Identification of the Strictness of Non-Tariff Barriers Enforcement

Non-tariff barriers in the form of technical barriers that are commonly applied and analyzed in empirical studies are barriers related to sanitary and phytosanitary measures (SPS) and barriers related to technical barriers to trade (TBT) (Hwang & Lim, 2017; Wood et al., 2019).

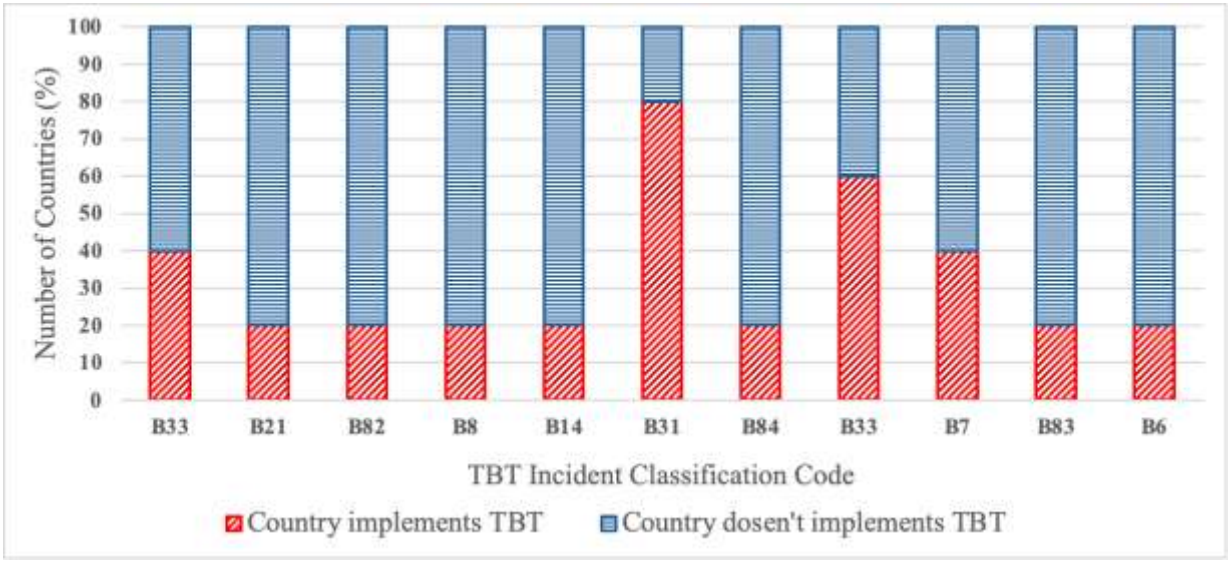
According to the WTO, the application of SPS and TBT provisions is still permitted because their main purpose is to protect human and animal health and improve the effectiveness and safety of technical regulations (Ghodsi, 2018). However, the implementation of SPS and TBT often poses challenges for developing countries, particularly in terms of their ability to meet the standards set, given their limited financial resources and administrative support capacity (Hwang & Lim, 2017; Kumar & Bharti, 2020).

Incidents involving the imposition of SPS barriers are much more frequent than TBT barriers in Indonesian and Vietnamese coffee exports to destination countries, namely the United States, Belgium, Malaysia, Japan, and Egypt. In Belgium, there were 17 SPS incidents for the four countries, while TBT incidents from all partners were relatively constant, at around 2 to 4 regulations per country. This shows that health and quarantine regulations (SPS) are a greater obstacle to coffee exports than technical regulations. Similar results were also found in a study by Wickrama et al. (2024), which showed that SPS barriers are widely applied to agricultural exports.

When broken down by incident classification code in SPS, there are 24 SPS incident codes applied by the five destination countries to Indonesian and Vietnamese coffee exports. The number of SPS codes applied is greater than the number of TBT codes applied, which is 11 incident codes. SPS barriers are used more frequently due to increased consumer awareness and demand for safe and high-quality agricultural products (Thuong, 2018; Wood et al., 2019). Therefore, SPS standards are used by the governments of destination countries as an instrument that not only protects human, animal, and plant safety, but also relates to the protection of environmental biodiversity and wildlife conservation (UNCTAD, 2019; Wood et al., 2019).



(a) SPS Barriers

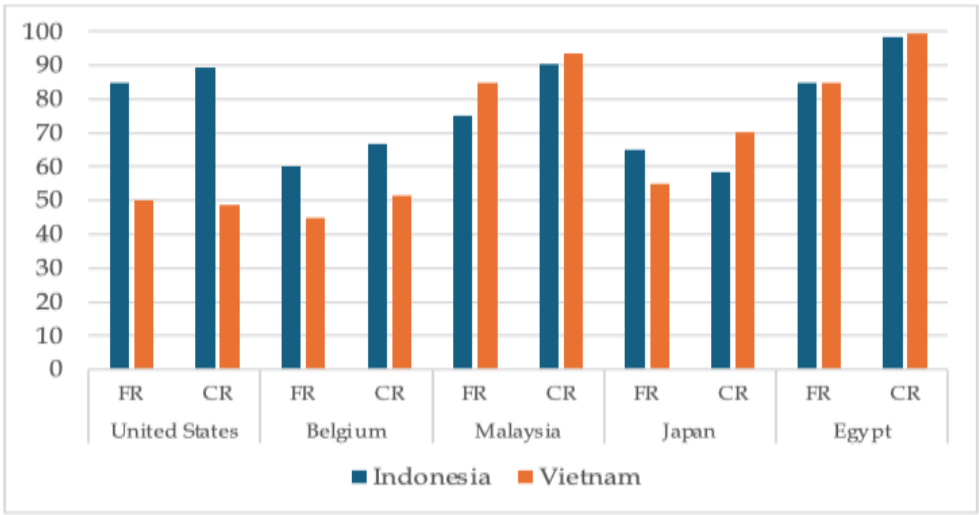


(b) TBT Barriers

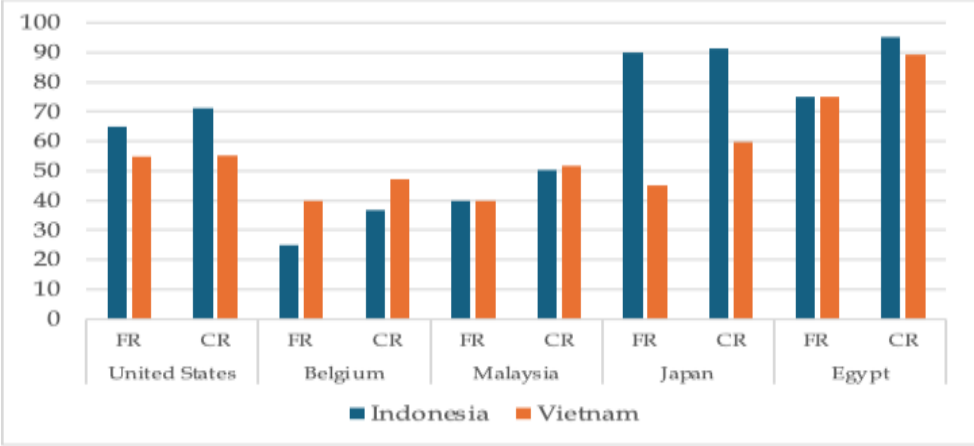
Figure 3. Application of non-tariff barriers on coffee exports from Indonesia and three exporting countries based on code classification for the period 2005-2024 (processed data, 2025)

Based on Figure 3, regulations on product labeling are the most dominant non-tariff barriers imposed by destination countries on Indonesian coffee exports and the three main coffee exporting countries, both in the SPS (A31) and TBT (B31) categories. According to UNCTAD (2019), labeling requirements include the provision of information in the form of text, electronic media such as barcodes or QR codes, or graphic elements in the form of symbols or logos that are printed on the packaging or presented separately but still related to the label or product.

The five destination countries that require product labeling requirements for Indonesian and Vietnamese coffee exports indicate that labeling standards are now one of the main prerequisites that exporters must meet. In the modern era, consumers are increasingly critical and want to know complete information about the food products they consume, so that information transparency has become a determining factor in their choices and purchasing behavior (Marchini et al., 2021; Pedersen et al., 2023). Thus, labeling standards for food products, including coffee, have become an official requirement in many countries, as labels on packaging serve not only as a means of providing information, but also as a guarantee of safety. Important information that is usually required includes ingredient composition, nutritional content and allergens, instructions for use, storage methods, production and expiration dates, manufacturer data, and additional attributes such as halal, organic, sustainability, and fair trade status (Grunert et al., 2014; Marchini et al., 2021; Priya & Alur, 2023; Sumarwan et al., 2017).



(a) SPS Barriers



(b) TBT Barriers

Figure 4. Distribution of non-tariff barriers on Indonesian and Vietnamese coffee exports by destination country for the period 2005-2024 (processed data, 2025)

Comparatively, both coffee-exporting countries face similar patterns of non-tariff barriers, but with different intensities and implications. Based on Figure 4a, the FR value of SPS barriers in export destination countries shows that Indonesia consistently faces a relatively high level of SPS implementation. In the United States, Indonesia's FR value is relatively high (85.00), while Vietnam faces a lower FR (50.00).

In Belgium, Indonesia's FR is at a medium level (60.00), but higher than Vietnam (45.00). In the Malaysian market, Indonesia again faces a high FR (75.00), although Vietnam has the highest FR value (85.00). In Japan, Indonesia's FR value is 65.00, higher than Vietnam's 55.00. Meanwhile, in the Egyptian market, both coffee exporting countries face extensive SPS barriers with a high FR value (85.00). These findings indicate that SPS barriers are widely applied in almost all destination countries, with Indonesia's coffee exports generally higher than Vietnam's in several major markets.

Furthermore, the CR value of SPS barriers shows that the coverage of Indonesian coffee trade affected by SPS regulations is relatively high in almost all destination countries. In the United States, Indonesia's CR SPS is at a high level (89.34), indicating that most of the coffee exports from the three countries to the US market are subject to SPS regulations, while Vietnam has a lower CR (48.79). In Belgium, Indonesia's CR is at a medium level (66.62) and slightly higher than Vietnam (51.37). In the Malaysian market, Indonesia has a very high SPS CR (90.45), although Vietnam (93.68) has a higher CR value, indicating that the value of coffee trade from competing countries is more widely covered by SPS barriers than Indonesia. In Japan, Indonesia's CR is relatively high (58.49) and comparable to Vietnam (70.15). Meanwhile, in the Egyptian market, both countries have very high SPS CR values, namely Indonesia (98.39) and Vietnam (99.40), reflecting that almost all coffee trade in this market is subject to SPS oversight.

Kee et al. (2009) and Marette et al. (2022) states that the difference in the number of exports affected by SPS barriers and the value of coffee trade affected by SPS barriers is related to production structure, institutional capacity for testing and certification, and target market orientation, all of which affect both the frequency and coverage of non-tariff barriers.

Based on the TBT barrier graph (Figure 4b), in the United States, Indonesia's FR TBT value is at a medium level (65.00) and slightly higher than Vietnam (55.00). In Belgium, Indonesia recorded the lowest TBT FR (25.00) compared to Vietnam (40.00), indicating that the scope of TBT barriers to Indonesian coffee products in this market is relatively more limited. In the Malaysian market, Indonesia's FR is also at a medium level (40.00) and Vietnam (40.00) shows a relatively similar value. In Japan, Indonesia faces a high TBT FR (90.00), which is the highest compared to Vietnam (45.00), indicating the strict application of technical standards to Indonesian coffee. Meanwhile, in Egypt, Indonesia's FR value is again relatively high (75.00) and comparable to Vietnam (75.00), reflecting the widespread and uniform application of technical barriers for both exporting countries.

Based on Figure 4b, it can be seen that in the United States, Indonesia's CR is at a medium level (71.02) and relatively comparable to Vietnam (55.31). In Belgium, Indonesia's CR is the lowest (36.87) compared to Vietnam (47.03), indicating that the proportion of Indonesian coffee exports that fall below TBT barriers is relatively limited in this market. In the Malaysian market, Indonesia's CR is 50.37 and comparable to Vietnam (51.55). In Japan, Indonesia faces a very high TBT CR (91.40) and is the highest compared to Vietnam,

reflecting that most of Indonesia's coffee export value to Japan is subject to strict technical regulations. Meanwhile, in Egypt, the CR values of both countries are at very high levels, including Indonesia (95.00) and Vietnam (89.30), indicating that technical barriers are widely applied and cover almost the entire value of coffee trade in that market.

Competitiveness Analysis

Competitiveness is a fundamental concept in economic and strategic management studies that reflects an entity's ability to maintain and improve its position amid competitive pressures.

The RCA index calculation results can be used to identify a positive relationship between a country's coffee export share and its comparative competitive advantage or disadvantage in the international market (Amanda & Rosiana, 2023). The RCA and RSCA values calculated for Indonesia and the main coffee exporting countries in the destination countries can be seen in Table 1.

Table 1. RCA and RSCA of Indonesian and Vietnamese coffee exports in destination countries for the period 2005-2024

Period Time	Destination Country	Indonesia		Vietnam	
		RCA	RSCA	RCA	RSCA
Period I (2005 - 2009)	United States	9.09	0.80	12.16	0.84
	Belgium	13.15	0.81	62.64	0.96
	Malaysia	6.88	0.74	32.22	0.94
	Japan	2.59	0.44	6.66	0.71
	Egypt	46.52	0.94	175.97	0.98
Period II (2010- 2014)	United States	7.46	0.76	7.37	0.75
	Belgium	13.57	0.86	49.49	0.96
	Malaysia	6.57	0.73	15.15	0.85
	Japan	2.44	0.42	6.17	0.72
	Egypt	31.14	0.94	39.77	0.94
Period III (2015 - 2019)	United States	8.01	0.78	3.86	0.56
	Belgium	13.42	0.84	31.47	0.94
	Malaysia	7.51	0.76	10.98	0.82
	Japan	2.59	0.44	5.34	0.68
	Egypt	36.98	0.95	40.93	0.95
Period IV (2020 - 2025)	United States	5.28	0.68	1.33	0.14
	Belgium	15.61	0.85	19.36	0.89
	Malaysia	5.26	0.66	11.72	0.83
	Japan	2.04	0.33	5.41	0.69
	Egypt	30.46	0.94	32.32	0.94

Source: Processed data (2025)

Compared to Vietnam, Indonesia shows a relatively weaker comparative advantage that tends to fluctuate throughout the four periods. However, Indonesia's position is relatively more stable in periods III and IV, when Vietnam experienced a sharp decline in RCA in several major markets. Nevertheless, the downward trend in Indonesia's RCA in Period IV indicates a weakening of relative competitiveness, especially after 2020, which could potentially be influenced by factors such as quality, productivity, and increasing non-tariff barriers. Overall, Indonesia is in a middle position, comparable to Vietnam in the final period.

Indonesia's coffee competitiveness is lower than Vietnam's due to increasingly stringent non-tariff barriers such as SPS and TBT provisions regulated by the WTO, especially for tropical agricultural products. The three incident codes that most affect Indonesian coffee exports are SPS A21, SPS A31, and TBT B31. Indonesia still faces difficulties in meeting the maximum pesticide residue limits and product labeling standards required by Japan and the European Union. Indonesia's compliance rate with the new SPS A21 code is only 63%, due to weak quality control at the farmer level and a suboptimal traceability system.

In addition, the OECD Trade Facilitation in Perishable Agro-Food Products (2021) report shows that Indonesia has not fully adopted export label harmonization in accordance with TBT B31, which has led to an increase in certification and repackaging costs in destination countries of up to 15–20%. In contrast, Vietnam has an international certification system and integrated labeling mechanism that facilitates compliance. These SPS and TBT barriers systematically undermine the competitiveness of Indonesian coffee in destination countries, causing Indonesian coffee to lose out in terms of efficiency, standard compliance, and quality perception compared to its three main competitors.

One factor contributing to the low quality of Indonesian coffee exports is that around 90% of the

product shipped overseas is still green coffee. The majority of coffee farmers in Indonesia are small-scale farmers with limited skills, so many of them harvest coffee beans before they reach optimal maturity. In addition, the moisture content of coffee beans often does not meet the recommended standard (12.5%), resulting in mold growth and broken beans due to the use of inadequate peeling equipment. These conditions have an impact on the decline in the selling value of Indonesian coffee in the international market (Sulistiyo et al., 2023).

After evaluating the comparative advantages of coffee bean exports, the next step is to integrate these findings with the Export Product Dynamics (EPD) analysis. Based on Table 2, in period I (2005–2009), Indonesia still showed relatively good performance with a Rising Star position in the US and Malaysian markets, but began to face pressure in Belgium and Japan, which were in the Lost Opportunity position, as well as a weak position in Egypt, namely Falling Star. Entering period II (2010–2014), Indonesia's market position tended to weaken with the dominance of the Retreat quadrant in Belgium, Malaysia, and Japan, although it was still able to maintain Rising Star in the United States and Egypt. In Period III (2015–2019), Indonesia's performance was further pressured with the majority of markets in the Retreat and Falling Star positions, reflecting a simultaneous decline in competitiveness and market share. In period IV (2020–2025), Indonesia showed limited improvement by returning to Rising Star in Belgium, but still faced Falling Star positions in the United States, Japan, and Egypt, indicating that the recovery in competitiveness was not yet evenly distributed across all major markets.

One of the causes of Lost Opportunity or Falling Star conditions is the increasing competition from other countries, such as Vietnam, which has successfully taken the top spot as the leading producer and exporter of robusta coffee, replacing Indonesia. Vietnam's success is due to several factors, including mass migration, land, government policy, crop selection, technology, and the coffee price boom (Manalu et al., 2019). The competitiveness and performance of Indonesian coffee exports to the United States need to be maintained and improved. To maintain and improve the competitiveness and performance of coffee exports, the strategy pursued must focus on two main aspects. The first is improving product quality and added value. This can be achieved through comprehensive improvements in the coffee processing process, at the farmer, trader, and processor levels, as well as through the development of differentiated processed coffee products. Second, ensuring compliance with destination market regulations, particularly by meeting the criteria and requirements set by the United States Food and Drug Administration (FDA), which is an absolute prerequisite for sustainable market access.

Table 2. EPD calculation results and dynamics of Indonesian and Vietnamese coffee export trade positions in destination markets for the period 2005-2024

Period Time	Destination Country	Indonesia			Vietnam		
		X-Axis (%)	Y-Axis (%)	Market Positions	X-Axis (%)	Y-Axis (%)	Market Positions
Period I (2005 - 2009)	United States	0.11	0.02	Rising Star	0.18	0.08	Rising Star
	Belgium	0.73	0.00	Lost Opportunity	1.24	0.01	Rising Star
	Malaysia	1.62	0.53	Rising Star	1.59	0.17	Rising Star
	Japan	0.07	-0.03	Lost Opportunity	1.01	0.07	Rising Star
	Egypt	-9.20	0.00	Falling Star	1.27	0.01	Rising Star
Period II (2010-2014)	United States	0.20	0.00	Rising Star	0.16	0.10	Rising Star
	Belgium	-0.39	-0.01	Retreat	0.50	0.03	Rising Star
	Malaysia	-1.57	-0.17	Retreat	-2.86	0.09	Falling Star
	Japan	-0.30	-0.10	Retreat	0.62	0.13	Rising Star
	Egypt	5.82	0.06	Rising Star	-0.49	0.03	Falling Star
Period III (2015 - 2019)	United States	-0.05	0.00	Falling Star	-0.40	0.24	Falling Star
	Belgium	0.44	0.00	Lost Opportunity	-2.01	0.04	Falling Star
	Malaysia	-1.05	-0.07	Retreat	-0.49	-0.01	Retreat
	Japan	-0.32	-0.13	Retreat	0.25	0.21	Rising Star
	Egypt	-0.44	-0.11	Retreat	-0.26	0.01	Falling Star
Period IV (2020 - 2025)	United States	-0.19	0.02	Falling Star	0.10	0.37	Rising Star
	Belgium	0.55	0.01	Rising Star	-1.64	0.04	Falling Star
	Malaysia	1.52	-0.06	Lost Opportunity	2.08	0.06	Rising Star
	Japan	-0.09	0.11	Falling Star	1.88	0.15	Rising Star
	Egypt	-1.36	0.06	Falling Star	0.69	0.00	Rising Star

Source: Processed data (2025)

Furthermore, Table 2 shows that Vietnam generally exhibits progressive market dynamics. In period I, Vietnam successfully occupied the Rising Star position in all major markets, namely the United States, Belgium, Malaysia, Japan, and Egypt. In period II, Vietnam still maintained its Rising Star position in most markets, although it began to experience Falling Star in Malaysia and Egypt. In period III, Vietnam's performance weakened with the dominance of Falling Star and Retreat positions in the United States, Belgium, Malaysia, and Egypt, while Japan still showed Rising Star. However, in period IV, Vietnam again showed significant strengthening with Rising Star positions in the United States, Malaysia, Japan, and Egypt, although Belgium remained in Falling Star. Tuyen et al. (2025) compared the market shares of major exporting countries and found that Vietnam's market share, along with Brazil's, were the two dominant players in coffee exports. Vietnam maintained a stable second position in market share. Then in 2021, its market share peaked at 22.4%, driven by strong demand for Robusta coffee in the European and Middle Eastern markets. Vietnam's main strengths include being the world's largest exporter of Robusta, offering competitive prices, stable production, and dominance in the low-cost coffee market. However, Vietnam is still heavily dependent on low-cost coffee and lacks premium products (Suryana et al., 2024; Tuyen et al., 2025).

Analysis of the Impact of Non-Tariff Barriers

To measure and quantify the impact of these invisible trade barriers, the concept of Ad Valorem Equivalent (AVE) is an essential analytical tool. AVE is defined as a hypothetical (implicit) import tariff that is equivalent to or would have the same impact on imports of a product as the applicable non-tariff barriers. In other words, AVE converts compliance costs (certification, testing, product modification, and administrative delays) incurred by exporters to meet SPS and TBT requirements. Through AVE estimates, it is possible to present the magnitude of non-tariff barriers that have been equated with tariffs in order to continue analyzing the impact of non-tariff barriers on the competitiveness of Indonesian and Vietnamese coffee exports.

Overall, as shown in Table 3, the AVE values of SPS and TBT non-tariff barriers indicate that export destination countries apply asymmetrical and varying regulatory patterns among exporters. Kurniasih & Panennungi (2021) add that AVE describes the amount of compliance costs that exporters must bear due to the SPS or TBT regulations of the destination country. The higher the AVE, the higher the non-tariff barriers felt by Indonesian and Vietnamese coffee exporters.

Table 3. AVE values of non-tariff barriers to Indonesian coffee and major coffee exporting countries for the period 2005-2024

Importer/Exporter	Indonesia		Vietnam	
	AVE SPS (%)	AVE TBT (%)	AVE SPS (%)	AVE TBT (%)
United States	28.71	42.96	88.01	33.30
Belgium	94.95	4.31	46.72	78.28
Malaysia	39.71	67.38	65.41	73.59
Japan	73.01	17.46	88.35	3.45
Egypt	21.64	33.07	92.49	89.56

Source: Processed data (2025)

Based on Table 3, it can be seen that Belgium and Japan have very high AVE values for SPS barriers, which shows their priority on food safety and quality standards. High SPS values indicate that countries with very strict health standards produce large SPS AVEs, thereby creating significant implicit tariffs for Indonesian coffee exports (Kee et al., 2009; Mao et al., 2023). Meanwhile, the United States and Malaysia display a balanced combination of SPS and TBT, while Egypt applies barriers selectively depending on the country of origin. These findings reinforce that high AVE values do not solely reflect trade protection, but also indicate differences in the capacity and readiness of exporters to comply with non-tariff regulations in their respective destination markets.

The discussion of the AVE value of SPS and TBT barriers in each export destination country shows that non-tariff regulations are applied with varying intensity and patterns across markets. Therefore, the next section will focus on the impact of non-tariff barriers on the competitiveness of exporting countries, in order to understand the extent to which SPS and TBT serve as instruments of protection as well as structural challenges in international trade. The estimated impact of SPS and TBT barriers is presented in Table 4.

Based on Table 4, the estimation results for Indonesia show that the GDP of exporters variable has a positive coefficient of 0.09637 but is not significant. Similarly, the GDP of importers has a positive coefficient of 0.56429 but is not significant. In addition, economic distance has a negative coefficient of -0.23457 and is not

significant. Conversely, export prices have a negative and significant effect with a coefficient of -0.00303 at a significance level below 1% (p-value 0.0050), which means that every increase in export prices reduces the competitiveness of Indonesian coffee. These results can be linked to the theory of demand, which states that when prices increase, demand tends to decrease (Paryanto, 2025). If the price of Indonesian coffee increases and becomes less competitive than that of its competitor Vietnam, demand will shift to countries that offer lower prices.

Table 4. Estimated impact of non-tariff barriers on Indonesia and major coffee exporting countries for the period 2005-2024

Independent Variable	Indonesia	Vietnam
C	-15.91735***	6.17780***
	(0.0065)	(0,0000)
GDP Exporter	0.09637	0.63003**
	(0.4360)	(0.0140)
GDP Importer	0.56429	0.01456
	(0.1780)	(0.4500)
Economic Distance	-0.23457	-0.19418***
	(0.1690)	(0.0015)
Export Price	-0.00303***	-0.00375
	(0.0050)	(0.3200)
Ad-Valorem SPS	-25.23688***	-0.96656***
	(0.0000)	(0.0030)
Ad-Valorem TBT	-11.43998***	-0.39530**
	(0.0000)	(0.0415)
R-Squared	0.9335	0.7127
Adjusted R-Squared	0.9169	
F-Statistic	56.19	16.12
Prob (F-Statistic)	0.0000	0.0000

Note: *** significant at the 1% level ** significant at the 5% level
Source: processed data (2025)

Furthermore, non-tariff barriers show the strongest impact, namely ad-valorem SPS with a coefficient of -25.23688 with a significance level of 0.0000 and ad-valorem TBT with a coefficient of -11.43998 with a significance level of 0.0000. These values indicate that stricter SPS and TBT regulations will reduce the competitiveness of Indonesian coffee, indicating structural limitations in meeting quality standards, food safety, and product traceability. These results are in line with Darhyati et al. (2017) Research shows that SPS has a negative effect on exports. Variations in policy between countries and increasingly strict SPS policies imposed by importing countries pose a major challenge to exporting countries. It is therefore necessary to coordinate standards through effective international cooperation. Meanwhile, the findings of the TBT barrier estimates are consistent with research conducted by Dung et al. (2024) on Vietnamese coffee exports, which states that TBT has a negative impact on Vietnamese coffee exports. These results show that technical regulations related to export products can affect the export performance of coffee from developing countries, including Indonesia.

For Vietnam, the GDP of exporters has a positive coefficient value of 0.63003 and is significant at the 5% level (p-value 0.0140), indicating that domestic economic growth significantly drives the increase in the competitiveness of Vietnamese coffee exports. Conversely, the GDP of importers is not significant with a coefficient of 0.01456 (p-value 0.4500), indicating that increased demand in destination markets has not been a determinant of the competitiveness of Vietnamese coffee exports. In addition, export prices have a negative coefficient value of -0.00375 and are not significant. International Coffee Organization (2022) explains that Vietnam's position as the world's leading supplier of robusta coffee results in relatively low price elasticity because Vietnamese coffee serves as an input for the industry (blending and instant coffee) with stable demand. Meanwhile, economic distance has a negative effect with a coefficient of -0.19418 and is highly significant (p-value 0.0015), indicating that distance barriers remain relevant. Then, for ad-valorem SPS and TBT, each has a negative and significant effect with coefficients of -0.96656 (p-value 0.0030) and -0.39530 (p-value 0.0415). This shows that increased strictness of non-tariff barrier regulations reduces the competitiveness of Vietnamese coffee exports. Crivelli & Groeschl (2016) shows that developing countries specializing in primary products tend to experience a

decline in exports when SPS and TBT standards are tightened, due to limited compliance capacity and high adjustment costs.

Overall, these results confirm that Indonesian and Vietnamese coffee exports remain highly vulnerable to increased SPS and TBT barriers, as stricter non-tariff regulations will reduce the competitiveness of coffee exports in both countries. Crivelli & Groeschl (2016) shows that non-tariff barriers such as SPS and TBT generally have a negative impact on exports from developing countries that are still oriented towards price-based markets. Differences in the direction and significance of export price coefficients also reinforce the fact that Indonesia is still in a price-based market.

Conclusion

This study examines the impact of non-tariff barriers on the competitiveness of Indonesia and Vietnamese coffee exports in major destination markets. The results indicate that Indonesian coffee exports face relatively high levels of non-tariff barriers, particularly in the form of Sanitary and Phytosanitary (SPS) and Technical Barriers to Trade (TBT). The FR and CR values show that SPS barriers (a total of 17 incident codes) are more frequently applied, with a value range of 60-90%. In the comparative competitiveness analysis, the RCA and RSCA calculations show that Indonesian coffee still has a comparative advantage. However, these values are still lower and less stable than those of Vietnam. EPD analysis shows that Indonesian coffee exports are mostly positioned in the lost opportunity, retreat, and falling star quadrants, while Vietnam consistently maintains a more dynamic market position. In addition, the estimation results show that SPS and TBT barriers, measured using the Ad Valorem Equivalent (AVE), have a negative and significant impact on the competitiveness of coffee exports from both countries.

Acknowledgments
The author would like to thank to all parties who has supported this research.

Author Contributions
Conceptualization, writing—original draft, N.A.H.N. and S.; methodology, N.; software, formal analysis, writing—revision and editing, visualization, project administration, N.A.H.N.; data curation, N.A.H.N. and N.; supervision, S. and N.; funding acquisition, S. All authors have read and approved the final version of this manuscript.

Funding
This research received no external funding.

Conflicts of Interest
The authors declare no conflict of interest.

References

Adnan, A., Teniro, A., & Zainudin, Z. (2022). Competitiveness of the Commodity Indonesian Coffee Beans the International Market. *Jurnal Manajemen*, *13*(3), 329. https://doi.org/10.32832/jm-uika.v13i3.7104

Amanda, S., & Rosiana, N. (2023). Analisis Daya Saing Kopi Indonesia dalam Menghadapi Perdagangan Kopi Dunia. *Forum Agribisnis*, *13*(1), 1–11. https://doi.org/doi.org/10.29244/fagb.13.1.1-11

Astuti, E. P., Nurmalina, R., & Rifin, A. (2023). Pengaruh Hambatan Tarif dan SPS pada Perdagangan Pertanian Indonesia dengan Negara G-20. *Buletin Ilmiah Litbang Perdagangan*, *17*(1), 43–68. https://doi.org/10.55981/bilp.2023.12

Azis, A. M., & Irjayanti, M. (2023). How Does the Coffee Supply Chain Work in Indonesia? *Journal of Optimization in Industrial Engineering*, *16*(2), 87–97. https://doi.org/10.22094/JOIE.2023.1986337.2068

Chanthavong, S. (2024). Quantifying the Impact of Trade Liberalization on Lao Imports (Evidence from Product-Level Data). *International Journal of Economic Policy Studies*, *18*(2), 455–474. https://doi.org/10.1007/s42495-024-00136-0

Crivelli, P., & Groeschl, J. (2016). The Impact of Sanitary and Phytosanitary Measures on Market Entry and Trade Flows. *World Economy*, *39*(3), 444–473. https://doi.org/10.1111/twec.12283

Darhyati, A. T., Suharno, S., & Rifin, A. (2017). Impact of Non Tariff Measure on Indonesian Cacao Exports. *International Journal of Agriculture System*, *5*(2), 175. https://doi.org/10.20956/ijas.v5i2.1191

Darmanto, E. B., & Riau, D. P. (2023). Determinants of Coffee Commodity Exports as An Effort of Post-Pandemic Economic Recovery COVID-19 in Indonesia. *Proceeding of The International Seminar on Business, Economics, Social Science and Technology (ISBEST)*, *3*(1), 99–104. https://doi.org/10.33830/isbest.v3i1.1322

Destiningsih, R., Sugiharti, R. R., Laut, L. T., Safiah, S. N., & Achsa, A. (2020). Competitiveness Identification of Fisheries Export in Indonesia. *IOP Conference Series: Earth and Environmental Science*, *530*(1). https://doi.org/10.1088/1755-1315/530/1/012017

Dung, V. T., Laike, Y., & Manh, D. T. (2024). Determinants Influencing Vietnam Coffee Exports. *Cogent Business & Management*, *11*(1). https://doi.org/10.1080/23311975.2024.2337961

Esterhuizen, D. (2006). *Measuring and Analysing Competitiveness in The Agribusiness Sector: Methodological and Analytical Framework*. University of Pretoria.

Ghodsi, M. M. (2018). Determinants of Specific Trade Concerns Raised on Technical Barriers to Trade EU

Versus Non-EU. *Empirica*, *45*, 83–128. https://doi.org/doi.org/10.1007/s10663-016-9347-1

Gordeev, R. (2020). Comparative Advantages of Russian Forest Products on the Global Market. *Forest Policy and Economics*, *119*, 102286. https://doi.org/10.1016/j.forpol.2020.102286

Grunert, K. G., Hieke, S., & Wills, J. (2014). Sustainability Labels on Food Products: Consumer Motivation, Understanding and Use. *Food Policy*, *44*, 177–189. https://doi.org/10.1016/j.foodpol.2013.12.001

Gumelar, S. A., Affandi, M. I., & Situmorang, S. (2020). Pengaruh Hambatan Nontarif di Pasar Uni Eropa Terhadap Ekspor Komoditas CPO Indonesia. *Jurnal Ilmu-Ilmu Agribisnis*, *8*(1), 86. https://doi.org/10.23960/jiia.v8i1.4347

Hwang, C. W., & Lim, S. S. (2017). Effect of Non-Tariff Measures on International Tea Trades. *Journal of Korea Trade*, *21*(4), 309–323. https://doi.org/10.1108/JKT-05-2017-0054

Hyun, H.-J., & Jang, Y. J. (2019). New Trade Restrictive Measures and Exports: Evidence from South Korea. *Seoul Journal of Economics*, *32*(2), 137–162. Retrieved from https://www.sje.ac.kr/xml/26567/26567.pdf

Immanuel, I., Suharno, S., & Rifin, A. (2019). The Progressive Export Tax and Indonesia'S Palm Oil Product Export Competitiveness. *Buletin Ilmiah Litbang Perdagangan*, *13*(2), 211–232. https://doi.org/10.30908/bilp.v13i2.417

International Coffee Organization. (2022). *Coffee Market Report*. Retrieved from https://ico.org/

Kee, H. L., Nicita, A., & Olarreaga, M. (2009). Estimating Trade Restrictiveness Indices. *Economic Journal*, *119*(534), 172–199. https://doi.org/10.1111/j.1468-0297.2008.02209.x

Kementerian Pertanian. (2023). *Statistik Kopi Indonesia 2023*. Jakarta: Badan Pusat Statistik. Retrieved from https://www.bps.go.id/id/publication/2024/11/29/d748d9bf594118fe112fc51e/statistik-kopi-indonesia-2023.html

Kumar, C., & Bharti, N. (2020). Post-SAFTA NTMs for Agricultural Trade: Revelations from the India–South Asia Approach. *Sage Journals*, *56*(1). https://doi.org/10.1177/0015732520961309

Kurniasih, T., & Panennungi, M. A. (2021). Estimating Ad Valorem Equivalents (AVES) of Non-Tariff Measures: The Case of the Sanitary and Phytosanitary (SPS) and Technical Barrier to Trade (TBT) in Indonesian Bilateral Trade with 20 Main Trade Partners. *Proceedings of the Asia-Pacific Research in Social Sciences and Humanities Universitas Indonesia Conference (APRISH 2019)*, *558*(Aprish 2019), 485–495. https://doi.org/10.2991/assehr.k.210531.062

Laursen, K. (2015). Revealed Comparative Advantage and the Alternatives as Measures of International Specialization. *Eurasian Bus Rev*, *5*, 99–115. https://doi.org/10.1007/s40821-015-0017-1

Manalu, D. S. T., Harianto, H., Suharno, S., & Hartoyo, S. (2019). Posisi Daya Saing dan Kinerja Ekspor Kopi Indonesia di Pasar Global. *Jurnal Ekonomi Pertanian dan Agribisnis*, *3*(4), 830–839. https://doi.org/10.21776/ub.jepa.2019.003.04.18

Mao, R., Liu, Y., & Wangi, X. (2023). Economic and Environmental Impacts of Agricultural Non-Tariff Measures: Evidence Based on Ad Valorem Equivalent Estimates. *International Food and Agribusiness* Management *Review*, *26*(3), 379–396. https://doi.org/10.22434/IFAMR2022.0094

Marchini, A., Riganelli, C., Diotallevi, F., & Polenzani, B. (2021). Label Information and Consumer Behaviour: Evidence on Drinking Milk Sector. *Agricultural and Food Economics*, *9*(1). https://doi.org/10.1186/s40100-021-00177-5

Marette, S., Disdier, A.-C., Bodnar, A., & Beghin, J. (2022). New Plant Engineering Techniques, R & D Investment and International Trade. *Journal of Agricultural Economics*, *74*(2), 349–368. https://doi.org/10.1111/1477-9552.12516

Mashayekhi, M. (2019). Services Trade, Structural Transformation and the SDG 2030 Agenda. *The Handbook of Global Trade Policy*, 79–117. https://doi.org/10.1002/9781119167402.ch4

Matondang, K., Dachi, I., Azmi, N., & Halomoan, Y. B. (2025). Dampak Perdagangan Internasional Terhadap Pertumbuhan Ekonomi Indonesia 2010 - 2021. *Ekopedia: Jurnal Ilmiah Ekonomi*, *18*(2), 485–499. https://doi.org/10.63822/y2v7bg44

Meliany, B. S., Syaukat, Y., & Hastuti, H. (2021). Struktur Pasar dan Daya Saing Karet Alam Indonesia di Amerika Serikat. *Buletin Ilmiah Litbang Perdagangan*, *15*(2), 235–256. https://doi.org/10.30908/bilp.v15i2.623

Nurhayati, E., Hartoyo, S., & Mulatsih, S. (2019). Analisis Pengembangan Ekspor Pala, Lawang, dan Kapulaga Indonesia. *Jurnal Ekonomi dan Pembangunan Indonesia*, *19*(2), 173–190. https://doi.org/10.21002/jepi.2019.11

Paryanto, E. (2025). Permintaan Kopi Indonesia: Faktor Penentu dan Implikasinya Terhadap Industri Kopi. *IJEBEF*, *5*(1), 145–155. https://doi.org/10.53067/ijebef.v5i1.228

Pedersen, S., Benson, T., Tsalis, G., Futtrup, R., Dean, M., & Aschemann-Witzel, J. (2023). What Consumers Want in a Sustainability Food Label: Results from Online Co-Creation Workshops in the United Kingdom, Ireland and Denmark. *Frontiers in Sustainability*, *4*, 1–15. https://doi.org/10.3389/frsus.2023.1342215

Pratama, A. P., Darwanto, D. H., & Masyhuri, M. (2020).

Indonesian Clove Competitiveness and Competitor Countries in International Market Article Information. *Economics Development Analysis Journal*, *9*(1), 39–54. Retrieved from http://journal.unnes.ac.id/sju/index.php/edaj

Priya, K. M., & Alur, S. (2023). Analyzing Consumer Behaviour Towards Food and Nutrition Labeling: A Comprehensive Review. *Heliyon*, *9*(9), e19401. https://doi.org/10.1016/j.heliyon.2023.e19401

Rindayati, W., & Kristriana, O. W. (2018). Impact Analysis of Non-Tariff Measures (NTM) on Indonesian Tuna Exports to Major Destination Countries. *Jurnal Manajemen dan Agribisnis*, *15*(2), 172–185. https://doi.org/10.17358/jma.15.2.172

Santoso, S. I., Pos, L. S. P., & Nurfadillah, S. (2022). Competitiveness Analysis of Indonesian Cinnamon Exports in the World Market. *Agrisocionomics*, *6*(2), 402–421. https://doi.org/10.14710/agrisocionomics.v6i2.15797

Siahaan, N. S., & Affandi, R. A. (2023). A Comparative Study of the Indonesian and Brazilian Coffee Industry: A Porter's Diamond Approach. *7th North American International Conference on Industrial Engineering and Operations Management*, 1954–1964. https://doi.org/10.46254/na07.20220444

Sulistiyo, D., Kusnaman, D., & Wijayanti, I. K. E. (2023). Analisis Daya Saing Ekspor Kopi Indonesia di Pasar Dunia. *Mimbar Agribisnis*, *9*(1), 1177–1185. http://dx.doi.org/10.25157/ma.v9i1.9315

Sumarwan, U., Simanjuntak, M., & Yuliati, L. N. (2017). Meta-Analysis Study: Reading Behavior of Food Products Label. *Journal of Consumer Sciences*, *2*(2), 26–40. https://doi.org/10.29244/jcs.2.2.26-40

Suryana, A. T., Harianto, H., Syaukat, Y., & Harmini, H. (2023). Geographic Scope of the Global Value Chain for Indonesian Coffee. *Coffee Science*, *18*(e182169). https://doi.org/10.25186/.v18i.2169

Suryana, A. T., Saleh, Y., Dewi, T. G., & Rahayu, H. S. P. (2024). Global Competitiveness of Coffee Products: A Comparative Study of Indonesia and Vietnam. *Coffee Science*, *19*(e192237). https://doi.org/10.25186/.v19i.2237

Tampubolon, J., Ginting, A., Nainggolan, H. L., & Tarigan, J. R. (2023). Indonesian Coffee Development Path: Production and International Trade. *Asian Journal of Agricultural Extension, Economics & Sociology*, *41*(12), 316–328. https://doi.org/10.9734/ajaees/2023/v41i122335

Thuong, N. T. T. (2018). The Effect of Sanitary and Phytosanitary Measures on Vietnam's Rice Exports. *EconomiA*, *19*(2), 251–265. https://doi.org/10.1016/j.econ.2017.12.001

TradeMap. (2025). *List of Importing Markets for a Product Exported by Indonesia; Brazil; Vietnam; Colombia; Germany, Product 0901 Coffee*. Retrieved from https://www.trademap.org/tradestatistics/

Tuyen, H. T., Samarasinghe, B. K. D. J. R., Phommarad, A., & Zhang, X. (2025). Vietnam' s Coffee Exports in the Global Coffee Market: An Analysis of Competitiveness, Constraints, and Strategic Reforms. *Sustainable Agriculture and Genetic Resources*, *3079*(7993). https://doi.org/10.71317/SAGR.002.01.0442

UNCTAD. (2010). *Non- Tariff Measures: Evidence from Selected Developing Countries and Future Research Agenda*. Retrieved from https://unctad.org/system/files/official-document/ditctab20093_en.pdf

UNCTAD. (2019). *International Classification of Non-Tariff Measures: 2019 Version*. Retrieved from https://unctad.org/system/files/official-document/ditctab2019d5_en.pdf

Wickrama, S. P., Kandangama, N. B., Wickramaarachchi, T., & Weerahewa, J. (2024). Assessing the Impact of Non-Tariff Measures on Sri Lankan Mango Exports: Insights, Challenges, and Recommendations. *Frontiers in Sustainable Food Systems*, *8*, 1–13. https://doi.org/10.3389/fsufs.2024.1293263

Wood, J., Wu, J., Li, Y., & Kim, J. (2019). The Impact of TBT and SPS Measures on Japanese and Korean Exports to China. *Sustainability (Switzerland)*, *11*(21), 1–23. https://doi.org/10.3390/su11216141

Yunita, P. (2021). Struktur Tata Kelola Global Value Chains Produk Kopi dalam Perdagangan Kopi Global: Studi Komparatif Kopi Indonesia dan Kopi Vietnam. *Jurnal Indonesia Sosial Sains*, *2*(5), 821–826. https://doi.org/10.36418/jiss.v2i5.299