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Original Article

Analysis of the Competitiveness of Indonesia Shallot Commodity Exports in the International Market

Rizqi Muttaqin[1*], Denny Saputera[2], Rizal Budi Santoso[3], Azzahra Putri Firmansyah[4], Rio Arsendo[5]

[1-5]Department of International Trade, Faculty of Economy and Business, Universitas Widyatama, Bandung, Indonesia
Email: [1)] rizqi.muttaqin@widyatama.ac.id, [2)] denny.saputera@widyatama.ac.id, [3)] budi.santoso@widyatama.ac.id, [4)] azzahra.firmansyah@widyatama.ac.id, [5)] rio.arsendo@widyatama.ac.id

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Abstract

Despite significant growth in domestic production, Indonesia's export performance remains relatively low and fluctuating compared to its production capacity. This study analyzes the competitiveness of Indonesian shallot exports in the international market during the period 2015-2024. This research employs a quantitative descriptive approach using key indicators, including Revealed Comparative Advantage (RCA), Revealed Symmetric Comparative Advantage (RSCA), Growth RCA, and Export Product Dynamics (EPD), to assess competitiveness and export dynamics. The results show that Indonesia's RCA values are generally below one, indicating a lack of strong comparative advantage, while RSCA values remain negative, reflecting weak competitiveness relative to major competitors such as Thailand and India. Growth RCA analysis reveals unstable competitiveness trends, heavily influenced by external factors such as global prices, trade policies, and the COVID-19 pandemic. Furthermore, EPD analysis indicates that Indonesian shallot exports are frequently positioned in the "Lost Opportunity" and "Retreat" categories, suggesting an inability to capitalize on growing global demand. In contrast, competing countries consistently demonstrate stronger and more stable export performance. The study concludes that Indonesia's high production potential has not been effectively translated into export competitiveness due to challenges related to product quality, logistics efficiency, and policy support. Therefore, strategic efforts are required to improve quality standards, enhance supply chain efficiency, and expand export markets in order to strengthen Indonesia's position in the global shallot trade.

Keywords: Export Competitiveness, Export Product Dynamics (EPD), Indonesia Shallots, International Trade, Revealed Comparative Advantage (RCA).

1. Introduction

The agricultural sector is a vital pillar of the Indonesian economy, with the horticultural subsector contributing significantly to food security and farmer welfare. One of the leading horticultural commodities with high economic value is the shallot (Hindarti & Maula, 2021). Indonesia is known as one of the largest shallot producers in Southeast Asia, with national production volume steadily increasing from approximately 1.2 million tons in 2015 to over 2 million tons in 2024 (Ministry of Agriculture of Indonesia, 2023). This increase demonstrates significant potential for the development of the shallot industry and trade in both domestic and global markets. The Indonesian shallot industry is a horticultural subsector that plays a strategic role in national food security, farmer incomes, and domestic and export trade (Nurunisa et al., 2024). Shallots are a leading Indonesian horticultural commodity, serving as

a staple food, a cooking spice, and a raw material for the food and traditional medicine industries (Awami et al., 2024; Triyono et al., 2021).

Indonesia is one of the largest shallot producers in Southeast Asia (Dewi et al., 2024; Fadzil et al., 2022). National production has shown an increasing trend over the past decade, supported by the development of production centers and improvements in cultivation technology. The main shallot-producing areas in Indonesia include Central Java, where Brebes Regency is the largest national production center, accounting for approximately 30-40% of total output. West Nusa Tenggara (NTB), particularly Bima and Sumbawa Regencies, holds significant export potential, while East Java features key production areas such as Nganjuk, Probolinggo, and Kediri. Additionally, West Sumatra and South Sulawesi are emerging as regions for cultivation expansion.

Table 1. Shallot Production From 2015-2024 in Tons

Years	Shallot Production (Tons)
2015	1,229,184
2016	1,446,860
2017	1,470,155
2018	1,503,436
2019	1,580,243
2020	1,815,445
2021	1,847,172
2022	1,920,120
2023	1,980,000
2024	2,085,979

Source: (BPS, 2024; Kementerian Pertanian Republik Indonesia, 2024)

However, this impressive production growth has not translated into a corresponding export performance, which constitutes the central problem motivating this research. However, despite relatively high domestic production, Indonesia's shallot exports remain relatively low, even fluctuating, and disproportionate to its production capacity. Data from the World Integrated Trade Solution (WITS) indicates that Indonesia's shallot export volume in 2023 was only around 9.6 thousand tons, significantly lower than total national production (WTO, 2023). Conversely, Indonesia continues to import large quantities of shallots, reaching over 150 thousand tons in the same year. This imbalance between abundant production and small export volumes indicates that Indonesia's shallot competitiveness in the international market remains low.

Table 2. Indonesia Export-Import Volume in kg

Years	Indonesian Shallot Exports (kg)	Indonesian Shallot Imports (kg)
2015	8,441,289	58,785,888
2016	748,781	104,951,225
2017	6,641,434,95	151,165,184
2018	5,243,230,49	120,921,169
2019	8,786,796,61	111,935,006
2020	8,540,364,86	134,885,030
2021	4,119,728,37	115,248,388
2022	2,498,244,2	178,014,080
2023	9,640,605,88	157,205,559
2024	13,954,132,6	75,814,397

Source: (Comtrade, 2024)

This competitiveness gap can be attributed to several structural constraints, including inadequate post-harvest facilities, a lengthy and inefficient supply chain, uneven regional production distribution, high production costs, and price instability. Competing countries such as Thailand, India, and Vietnam (Ho et al., 2025) have been able to penetrate international markets with more consistent quality standards and lower production costs, further marginalizing Indonesia's position in the global shallot trade. Understanding these dynamics is therefore not merely an academic exercise but an urgent policy imperative, as closing the gap between production potential and export performance is essential for improving farmer welfare, strengthening food security, and reducing costly import dependence.

The central concern of this research is the persistent disconnect between Indonesia's substantial shallot production capacity and its weak export competitiveness in the international market over the period 2015 to 2024. To address this, the research seeks to answer four interconnected questions: how competitive Indonesian shallot exports have been in the international market during this period; how export performance has developed over time; how Indonesia's competitiveness compares to that of its main competitors, namely Thailand, India, and Vietnam; and what strategies can be implemented to improve export performance and strengthen Indonesia's competitive position.

In alignment with these questions, this research pursues four corresponding objectives. First, it analyzes the trajectory of Indonesian shallot production, exports, and imports over the past decade to establish an empirical foundation. Second, it measures export competitiveness using established indicators, specifically the Revealed Comparative Advantage (RCA), Revealed Symmetric Comparative Advantage (RSCA), and Export Product Dynamics (EPD). Third, it identifies the structural and policy-related factors that have constrained Indonesia's export competitiveness. Fourth, on the basis of these findings, it formulates strategic policy recommendations aimed at strengthening the national shallot sector, increasing export competitiveness, and reducing Indonesia's dependence on shallot imports.

2. Literature Review

Export competitiveness refers to a country's ability to produce and market goods effectively in the international market, reflecting not only production capacity but also efficiency, quality, and distribution performance. It encompasses both comparative advantage which related to resource efficiency and cost structures and competitive advantage, which emphasizes innovation, value addition, and adaptability to market dynamics. To measure export competitiveness, several quantitative indicators are commonly used, including Revealed Comparative Advantage (RCA), which assesses comparative advantage based on export performance; Revealed Symmetric Comparative Advantage (RSCA), which refines RCA into a symmetrical scale for better comparison; Growth RCA, which evaluates changes in competitiveness over time; and Export Product Dynamics (EPD), which categorizes export performance into strategic positions such as rising star, falling star, lost opportunity, and retreat.

Empirical studies on Indonesia shallots show mixed results: while the commodity demonstrates comparative advantage at the production level, it faces persistent challenges in export performance due to price volatility, inconsistent policies, limited quality standards, inefficient supply chains, and inadequate post-harvest infrastructure. Previous research also indicates that Indonesia's competitiveness remains below that of key competitors such as Thailand and Vietnam. However, existing studies are often limited by short observation

periods, partial use of competitiveness indicators. Therefore, this study addresses these gaps by providing a comprehensive analysis of Indonesian shallot export competitiveness over the 2015-2024 period using an integrated approach combining export competitiveness tools.

2.1. The Concept of Export Competitiveness

Export competitiveness measures a country's ability to produce and market products that are competitive in the international market (Porter, 1990). According to Balassa (1965), a country's comparative advantage can be revealed through actual export performance without directly knowing the relative production costs between countries. In the context of agricultural trade, export competitiveness reflects the efficiency and ability of the agricultural sector to leverage domestic resource advantages to gain a strategic position in the global market (Saptana et al., 2021). Competitiveness can be divided into comparative advantage and competitive advantage (Hanifah, 2022). Comparative advantage focuses more on resource efficiency and cost structure, while competitive advantage emphasizes innovation, added value, and adaptation to market changes (Porter, 2008). Therefore, analyzing agricultural export competitiveness not only assesses production volume but also considers aspects of quality, productivity, and distribution efficiency. Several quantitative approaches are used to measure export competitiveness, including:

2.2. Revealed Comparative Advantage (RCA)

The RCA indicator was developed by Balassa (1965) to measure comparative advantage based on a country's export realization to the world market. The RCA formula measures the ratio between a commodity's share of total national exports and its share of global exports. An RCA>1 indicates a country has a comparative advantage in that commodity, while RCA<1 indicates the opposite. Several studies have applied RCA to measure the competitiveness of Indonesian shallot exports. For example, Saptana et al. (2021) showed that Indonesian shallots have an RCA>1 in several Southeast Asian regional markets. Yet this competitiveness has not been stable in the long term due to price fluctuations and trade policies.

2.3. Revealed Symmetric Comparative Advantage (RSCA)

The RSCA method was developed to address the asymmetrical weakness of RCA. According to Laursen (2015), RSCA allows comparisons between periods with a value range of -1 to +1. Positive values indicate comparative advantage, while negative values indicate competitive weakness. RSCA is widely used in comparative studies between countries because it facilitates interpretation of the direction of competitiveness changes (Haryati et al., 2024).

2.4. Growth Revealed Comparative Advantage

Growth RCA is used to assess changes or trends in a commodity's competitiveness over time. This indicator helps determine whether a product's comparative advantage is increasing or decreasing over a given period. According to Wahyuningsih et al. (2022), positive RCA growth reflects improved export performance, while negative growth indicates a decline in competitiveness in the international market.

2.5. Export Product Dynamics (EPD)

The EPD model developed by Hinloopen and Marrewijk (2001) categorizes a product's export dynamics based on market share growth and global exports. Products are classified into four positions: rising star, falling star, lost opportunity, and retreat. The EPD provides a strategic view of a product's long-term prospects in the global market. Research by Aldila et al. (2017) applied the EPD to horticultural commodities and found that the majority of

Indonesian shallot exports fell into the lost opportunity category, indicating a loss of export opportunities despite increasing global demand.

2.6. Previous Research

Various previous studies have examined the competitiveness of Indonesian shallot exports, yielding mixed and often partial findings. Saptana et al. (2021) analyzed shallot competitiveness using a policy analysis matrix and found that shallots possess a comparative advantage at the production level but continue to face obstacles in distribution efficiency and export quality. Sahara et al. (2019) examined shallot price volatility and demonstrated that domestic price fluctuations and temporary import policies significantly undermine export stability, as domestic price adjustment policies often disrupt export continuity when international prices fall below domestic prices. Haryati et al. (2024) assessed shallot competitiveness in the ASEAN region using RCA and RSCA methods and found that Indonesia's competitiveness remains lower than that of Thailand and Vietnam, attributing this to limitations in quality standards and supply chain management. Aldila et al. (2017) similarly showed that despite increases in Indonesian shallot productivity, cost inefficiency and limited storage infrastructure hinder sustainable competitiveness in the global market.

Taken together, these studies confirm that Indonesia holds significant shallot production potential but has not consistently translated this into strong export performance. Nevertheless, the existing literature contains several specific and substantive limitations that this study directly addresses. First, most studies rely on data ending no later than 2021 or 2022, leaving the more recent and arguably more volatile post-pandemic trade period (2022-2024) entirely unexamined. Second, prior analyses are largely confined to RCA and EPD indicators without incorporating Growth RCA, which means competitive trajectory and momentum over time have not been adequately captured. Third, existing studies treat competitiveness as a static measurement rather than situating it within a causal framework, as none have integrated RCA, RSCA, and Growth RCA indicators with econometric models capable of testing the structural determinants of competitiveness. Fourth, variables related to product quality, certification standards, and destination market granularity remain largely absent from the analytical frameworks of prior research.

What is genuinely new about this study, therefore, is not simply the extension of the time series to 2015-2024, but the simultaneous deployment of four complementary methods, namely RCA, RSCA, Growth RCA, and EPD, applied to the most current available data, with explicit attention to how quality and structural factors shape competitive outcomes across specific destination markets. This integrated and contemporaneous approach constitutes a contribution that no prior study on Indonesian shallot export competitiveness has offered, and from which more targeted and empirically grounded policy recommendations can be derived. Figure 1 shows the research framework for Indonesian export competitiveness within this study.

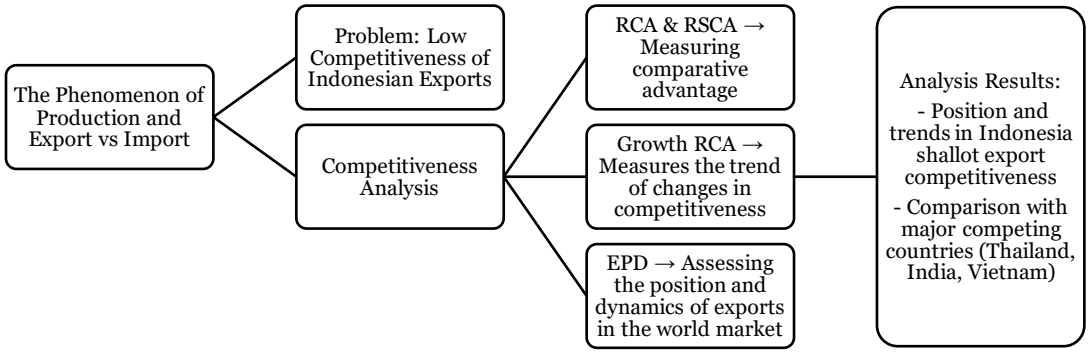

Figure 1. Research Framework

3. Methods

This study employs a descriptive quantitative approach with comparative analysis to measure and analyze the competitiveness of Indonesian shallot exports in the international market over the period 2015 to 2024, using secondary international trade data sourced from UN Comtrade and WITS. The analytical framework combines four complementary indicators, each selected to address a specific analytical need. The Revealed Comparative Advantage (RCA) index serves as the foundational measure of Indonesia's comparative advantage in shallot exports relative to world trade, and is selected for its widespread acceptance and cross-country comparability. The Revealed Symmetric Comparative Advantage (RSCA) is framed as a normalized transformation of RCA that corrects for its asymmetric distribution, enabling more reliable trend comparisons across the study period. Growth RCA is added specifically to capture competitive momentum, measuring whether Indonesia's comparative advantage is strengthening or weakening over time, a dynamic dimension that RCA and RSCA alone cannot provide. Finally, Export Product Dynamics (EPD) classifies Indonesia's strategic market position by combining export share growth with world market demand growth, mapping the commodity into one of four strategic categories: rising star, falling star, lost opportunity, or retreat.

The deliberate combination of these four methods ensures that each indicator compensates for the limitations of the others, producing a more comprehensive assessment of competitiveness than any single method could provide, and directly addressing the analytical gaps identified in the prior literature.

3.1. Types and Sources of Data

This research uses secondary time-series data collected from official and internationally recognized sources covering the period 2015 to 2024, chosen to capture the full dynamics of production, trade, and policy shifts including the post-pandemic recovery period and the most recent export trends. Table 3 presents the types of data used and their corresponding sources.

Table 3. Data Types dan Sources of Data

Data Types	Description / Source
Indonesian shallot export data (value and volume)	Badan Pusat Statistik (BPS), UN Comtrade, ITC Trade Map
Total exports of all Indonesian commodities	BPS, UN Comtrade
World shallot export data	UN Comtrade, FAO Trade Statistics
Total world exports	UN Comtrade, WTO Data
Supporting data (prices, imports, policies)	Kementerian Pertanian, Kementerian Perdagangan, World Bank

Table 4 presents the research variables used in the competitiveness calculations, along with their units of measurement and data sources. All derived indicators including RCA Growth and export share are computed from the primary data retrieved from the sources listed.

Table 4. Research Variables

Variables	Symbol	Unit / Size	Data Source
The export value of Indonesian shallots	Xij	USD	BPS, UN Comtrade
Indonesia's total exports	Xit	USD	BPS
World shallot export value	Xwj	USD	UN Comtrade
Total world exports	Xwt	USD	UN Comtrade
RCA Growth	ΔRCA	(%)	Calculation results
Indonesia's export share in the world	Share	(%)	Calculation results

3.2. Data Analysis Methods

The analysis is carried out through four main stages, namely:

3.2.1. Revealed Comparative Advantage (RCA) Analysis

RCA was first introduced by Balassa (1965) to measure a country's comparative advantage based on actual export data. The formula is as follows:

$$RCAij = \left(\frac{Xwj}{Xwt}\right)\left(\frac{Xij}{Xit}\right)$$

Description:
Xij: Export value of commodity j (shallots) by country i (Indonesia)
Xit: Total exports of all commodities by country i
Xwj: Export value of commodity j by world
Xwt: Total exports of all commodities by world

Interpretation of the revealed comparative advantage (RCA) is as follows: RCA greater than 1 means Indonesia has a comparative advantage in shallot exports, while RCA less than 1 means Indonesia does not have a comparative advantage. The RCA analysis steps are: collect data on the value of shallot exports and total Indonesian exports; collect data on the value of shallot exports and total global exports; calculate the RCA annually from 2015 to 2024; and interpret annual and overall RCA trends.

3.2.2. Revealed Symmetric Comparative Advantage (RSCA) Analysis

RCA is asymmetrical (scale 0 to infinity). Therefore, Laursen (1998) proposed the RSCA index with the formula:

$$RSCA = \frac{RCA - 1}{RCA + 1}$$

The revealed symmetric comparative advantage (RSCA) value ranges from -1 to +1, with the following interpretations: an RSCA greater than 0 indicates high competitiveness (comparative advantage), while an RSCA less than 0 indicates low competitiveness (no comparative advantage). The RSCA analysis steps are: calculate the RCA value each year; convert the RCA value to RSCA using the formula above; and analyze the direction and stability of competitiveness from 2015 to 2024.

3.2.3. Competitiveness Growth Analysis (Growth RCA)

$$Growth\ RCA\tau = \frac{RCA\tau - RCA\tau - 1}{RCA\tau} - 1x100\%$$

Interpretation of RCA growth is as follows: a positive value indicates an increase in competitiveness, while a negative value indicates a decrease in competitiveness. The steps for RCA growth analysis are: use annual RCA results; calculate RCA growth between years; and analyze trends in increasing or decreasing shallot competitiveness.

3.2.4. Export Product Dynamics (EPD) Analysis

The EPD method was developed by Hinloopen and Marrewijk (2001) to analyze the position and dynamics of a country's export products in the global market, using two main indicators: growth in export market share of product i from country j, and growth in total world exports of product i. The formula for calculating the EPD is:

$$EPDij = \frac{\left(\frac{Xij,t2}{Xij,t1}\right)}{\left(\frac{Xwj,t2}{Wxj,t1}\right)}$$

The results of the EPD analysis are then classified into four quadrants based on a combination of two dimensions (market share vs. world export growth):

Table 5. EPD Category

EPD Category	Conditions	Interpretation
Rising Star	Market share increases, world exports increase	Competitive and prospective commodities
Falling Star	Market share increases, world exports decrease	Competitive, but the global market is shrinking
Lost Opportunity	Market share declines, world exports increase	Competitiveness decreases; lost opportunities
Retreat	Market share declines, world exports decline	Not competitive and not prospective

The steps in the EPD analysis are: calculate Indonesia's export share of world exports per year; calculate the growth rate of Indonesia's export share and world exports; map the position of Indonesian shallot exports into the four EPD quadrants; and analyze the shift in position (dynamics) from year to year.

3.3. Analysis and Interpretation Techniques

The analysis and interpretation techniques include descriptive statistics, which explain trends in shallot production, exports, and imports from 2015 to 2024, and illustrate the RCA, RSCA ratios, and their growth. Competitiveness analysis using RCA, RSCA, growth RCA, and EPD calculates all indicators based on annual data and compares results between periods to see changes in competitiveness. Comparative analysis between countries is optional, comparing Indonesia's competitiveness with competing countries such as Thailand and India based on RCA and EPD. Finally, policy interpretation draws conclusions about Indonesia's shallot export position and develops recommendations for strategies to strengthen competitiveness based on the results of the empirical analysis.

3.4. Data Validity and Reliability

The data used comes from official institutions such as BPS, UN Comtrade, and ITC Trade Map to ensure validity. Reliability was tested by comparing data consistency across sources and years, and cross-checking with official reports from the Ministry of Agriculture (Pusdatin, 2025)

3.5. Research Limitations

Some potential limitations include that shallot export data is sometimes classified differently across agencies (HS code 070310 - Fresh Shallots/Onions); the RCA and RSCA analyses do not directly consider price or policy factors; and the EPD analysis is descriptive and needs to be complemented with advanced econometric models to examine the determinants of competitiveness.

4. Results and Discussion

Shallots are a strategic horticultural commodity in Indonesia, playing a crucial role in both domestic consumption and export activities (Balitsa, 2024). Indonesian shallot production has increased significantly over the past decade, but this increase has not been fully matched by optimal export performance. This situation indicates a gap between domestic production capacity and global market penetration.

In general, Indonesian shallot exports are still dominated by Southeast Asian markets such as Malaysia, Thailand, and Singapore. However, the contribution of shallot exports to Indonesia's total agricultural exports remains relatively small compared to competing countries like Thailand and India. Therefore, analyzing the competitiveness of shallot exports is crucial for assessing Indonesia's competitive position in the international market.

4.1. Revealed Comparative Advantage Analysis RCA

The RCA index, developed by Balassa (1965), measures whether a country holds a comparative advantage in exporting a given commodity relative to the world average by calculating the ratio between a commodity's share of total national exports and its share of global exports. An RCA value greater than one indicates comparative advantage while a value below one indicates its absence.

Table 6. Revealed Comparative Advantage Results

Year	RCA Indonesia	RCA Thailand	RCA India
2015	0.2557	0.1933	7.919
2016	0.0134	0.1298	6.9478
2017	0.2885	0.1914	7.7311
2018	0.1887	0.1748	7.0232
2019	0.276	0.1771	4.9677
2020	0.3635	0.2916	5.4089
2021	0.1657	0.3142	6.2149
2022	0.075	0.2439	6.3725
2023	0.2036	0.2009	6.5733
2024	0.3168	0.301	4.2832

Indonesia's RCA values remained consistently below one throughout the entire 2015-2024 period, ranging from 0.013 in 2016 to 0.364 in 2020, confirming the absence of comparative advantage in shallot exports across the full study period. This finding is consistent with Saptana et al. (2021), who similarly found that Indonesia's shallot competitiveness has not been stable in the long term. Thailand's RCA values were likewise below one across all years, ranging from 0.130 to 0.314, placing it in a comparable competitive tier to Indonesia rather than the distinctly superior position suggested by prior studies such as Haryati et al. (2024), implying that Thailand's perceived advantage stems more from supply chain efficiency and policy consistency than from fundamental comparative advantage. India, by contrast, recorded RCA values consistently exceeding four across all years, ranging from 4.283 in 2024 to 7.931 in 2015, confirming its dominant comparative advantage grounded in large production scale, low costs, and diversified export networks. India, by contrast, recorded RCA values consistently exceeding four across all years, peaking at 7.919 in 2015, reflecting the dominant comparative advantage that its large production scale, low costs, and diversified export networks to Middle Eastern and African markets confer.

Table 7. Revealed Symmetric Comparative Advantage Results

Year	RSCA Indonesia	RSCA Thailand	RSCA India
2015	-0.5928	-0.676	0.7758
2016	-0.9735	-0.7702	0.7484
2017	-0.5522	-0.6787	0.7709
2018	-0.6825	-0.7024	0.7507
2019	-0.5673	-0.6991	0.6649
2020	-0.4668	-0.5484	0.6879
2021	-0.7157	-0.5219	0.7228
2022	-0.8605	-0.6079	0.7287
2023	-0.6617	-0.6654	0.7359
2024	-0.5188	-0.5373	0.6214

The RSCA results confirm and sharpen the RCA findings. Indonesia's RSCA values were negative throughout the entire study period, ranging from -0.974 in 2016 to -0.467 in 2020, indicating persistently weak export competitiveness, consistent with Haryati et al. (2024) who attributed this to quality standard limitations and supply chain inefficiencies. Thailand's RSCA values were similarly negative across all years, ranging from -0.770 to -0.522, placing it in a comparable competitive tier to Indonesia rather than the distinctly superior position implied by some prior studies. India's RSCA remained consistently positive across all years, ranging from +0.621 to +0.776, confirming its structurally superior competitive position and reflecting the scale economies and market diversification advantages emphasized by Porter (1990).

4.2. Growth RCA Analysis

The Growth RCA (RCA) describes changes in a commodity's competitiveness over time. Positive values indicate increasing competitiveness, while negative values indicate decreasing competitiveness.

Table 8. Growth RCA Results

Year	GrowthRCA Indonesia	GrowthRCA Thailand	GrowthRCA India
2016	-94.75	-32.84	-12.26
2017	2049.71	47.4	11.27
2018	-34.59	-8.67	-9.16
2019	46.26	1.31	-29.27
2020	31.7	64.71	8.88
2021	-54.41	7.73	14.9
2022	-54.76	-22.38	2.54
2023	171.53	-17.62	3.15
2024	55.64	49.84	-34.84

Indonesia's Growth RCA exhibits the most extreme volatility among the three countries, ranging from -94.75 in 2016 to +2049.71 in 2017, with another surge to +171.53 in 2023. These spikes must be interpreted cautiously, as the 2017 figure is arithmetically inflated by the near-zero baseline of 2016 rather than reflecting genuine structural improvement. Consistent with Aldila et al. (2017), this volatility indicates that Indonesia's competitiveness remains driven by external shocks such as global price movements and trade policy changes rather than enduring efficiency gains, with the consecutive declines in 2021 and 2022 coinciding with pandemic-related export restrictions and domestic supply pressures.

Thailand's Growth RCA was more moderate and stable, with positive values in 2017, 2019, 2020, and 2024, reflecting greater policy consistency and logistical efficiency. India's Growth RCA, predominantly positive in earlier years, turned sharply negative in 2024 at -

34.84, attributable to export price fluctuations and domestic price stabilization interventions similar to those seen during its 2021 export ban.

4.3. Export Product Dynamics Analysis EPD

The EPD model, developed by Hinloopen and Marrewijk (2001), classifies a product's export position by combining the country's export growth with global export market growth. Products are assigned to one of four strategic positions: Rising Star (both country and world exports growing, with country growth exceeding world growth), Falling Star (country exports growing but global growth declining), Lost Opportunity (world exports growing but country exports declining), and Retreat (both declining).

Table 9. Export Product Dynamics Result

Export Product Dynamics: Growth Rates (%)				
Year	**World Growth**	**Indonesia Growth**	**Thailand Growth**	**India Growth**
2016	0.64	-94.79	-30.25	-10.72
2017	-3.2	2109.16	42.43	10.66
2018	9.38	-30.44	-2.93	-0.86
2019	19.9	68.05	22.02	-12.45
2020	-5.34	30.35	57.55	-5.63
2021	-0.62	-49.08	-0.39	29.66
2022	7.9	-43.32	-18.57	16.72
2023	19.47	199.73	1.83	22.52
2024	-5.76	56.94	55.95	-35.27
Export Product Dynamics: Strategic Position Classification				
	Year	**Indonesia**	**Thailand**	**India**
	2016	Lost Opportunity	Lost Opportunity	Lost Opportunity
	2017	Falling Star	Falling Star	Falling Star
	2018	Lost Opportunity	Lost Opportunity	Lost Opportunity
	2019	Rising Star	Rising Star	Lost Opportunity
	2020	Falling Star	Falling Star	Retreat
	2021	Retreat	Retreat	Falling Star
	2022	Lost Opportunity	Lost Opportunity	Rising Star
	2023	Rising Star	Mixed	Rising Star
	2024	Falling Star	Falling Star	Retreat

The EPD results reveal that Indonesia most frequently occupies the Lost Opportunity position, occurring in 2016, 2018, and 2022, indicating that global shallot market demand was growing during these years but Indonesia failed to expand its export share to capture it. This finding directly corroborates Aldila et al. (2017), who applied EPD to Indonesian horticultural commodities and found that the majority of shallot exports fell into the lost opportunity category. The Retreat position in 2021 reflects the simultaneous contraction of both Indonesia's exports and the global market, coinciding with pandemic disruptions. The Rising Star positions in 2019 and 2023 represent the only years in which Indonesia successfully grew exports faster than world market growth, suggesting that improvements are possible but remain episodic rather than structural.

Thailand's EPD trajectory closely mirrors Indonesia's across most years, further reinforcing the finding from the RCA and RSCA analyses that the two countries are more competitively similar than previously characterized. India's dominance is confirmed by its Rising Star position in 2019, 2022, and 2023, though its shift to Retreat in 2024 due to export price fluctuations demonstrates that even structurally strong exporters remain vulnerable to policy-induced disruptions.

4.4. Comparative Synthesis and Interpretation

Table 10 synthesizes the results across all four indicators to provide an integrated assessment of competitive positioning.

Table 10. Comparative Synthesis

Indicator	Indonesia	Thailand	India
RCA (Average)	0.9	1.3	2.0
RSCA (Average)	-0.2	+0.15	+0.45
Dominant EPD categories	Lost Opportunity	Rising Star	Rising Star
Competitiveness trends	Fluctuating	Stable	Strong

The synthesis across all four indicators yields a more nuanced picture than prior literature suggested. India's competitive superiority is unambiguous and consistent across all measures, grounded in scale, cost, and market diversification advantages (Porter, 1990). Indonesia and Thailand, however, occupy a comparable competitive tier, with nearly identical RCA and RSCA averages, suggesting that Thailand's perceived superiority stems from greater supply chain efficiency and policy coherence rather than inherent comparative advantage. For Indonesia, the recurrent Lost Opportunity pattern in 2016, 2018, and 2022 indicates latent export capacity that structural and policy constraints repeatedly prevent from being realized, a conclusion consistent with Saptana et al. (2021) and Sahara et al. (2019) and one that directly informs the policy recommendations below.

4.5. Policy Implications

Based on the analysis, several policy implications that can be taken include increasing export capacity through modernizing logistics systems and post-harvest facilities; standardizing export quality by expanding the implementation of GAP, HACCP, and international SPS certification standards; diversifying export markets to the Middle East and South Asia to reduce dependence on regional markets; collaborating among ASEAN countries to strengthen the regional horticultural value chain; and improving production cost efficiency and adopting precision agriculture technology to increase export price competitiveness.

4.6. Revealed Symmetric Comparative Advantage Analysis RSCA

RSCA is a transformation of the RCA value to avoid distortions caused by extreme values. RSCA values range from -1 to +1. Positive values indicate comparative advantage, while negative values indicate competitive weakness.

5. Conclusion

This study demonstrates that Indonesia's substantial shallot production capacity has not translated into meaningful export competitiveness over the 2015-2024 period. Across all four indicators, Indonesia's position remains consistently weak: RCA values stayed below one throughout the entire study period, RSCA averaged -0.64, Growth RCA exhibited extreme volatility driven by external shocks rather than structural improvements, and the dominant EPD classification of Lost Opportunity confirms that Indonesia repeatedly failed to capture growing global demand. Comparatively, India holds unambiguous competitive superiority grounded in scale and market diversification, while Thailand's marginal outperformance over Indonesia derives from policy coherence and supply chain efficiency rather than any fundamental difference in comparative advantage.

The theoretical contribution of this finding is significant: it suggests that for agricultural commodities in developing economies, production-level comparative advantage is a necessary

but insufficient condition for export competitiveness, and that the gap between productive potential and market performance is primarily explained by institutional and infrastructural factors rather than resource endowments.

In policy terms, the priority interventions are clear. Closing the competitiveness gap requires post-harvest infrastructure investment to convert latent export capacity into realized supply, quality certification aligned with international SPS standards to unlock market access, export policy stability to sustain market relationships, and destination market diversification beyond Southeast Asia. Without these structural reforms, Indonesia's shallot sector will continue to occupy the Lost Opportunity position regardless of future production growth.

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