

JURNAL AGROEKOTEKNOLOGI TERAPAN

Applied Agroecotechnology Journal

Agroteknologi Universitas Sam Ratulangi

e_ISSN:2797-0647

Export Competitiveness of Indonesian and Thai Fresh Coconuts in China**Netania Br Ginting, Maya Hendrietta Montolalu*, Lyndon Reinhart Jacob Pangemanan**Agribusiness Study Program,
Department of Agricultural
Socioeconomics, Faculty of
Agriculture, Sam Ratulangi
University, Manado, Indonesia*Corresponding author:
mayahmr2000@gmail.comManuscript received: 15 July 2026
Revision accepted: 15 Sept 2026

Abstract. Fresh coconuts in the inner shell (HS 080112) are an agricultural export commodity supplied by Indonesia and Thailand to China. This study compared their revealed comparative advantage, annual changes in export-market share, and export unit values during 2015–2024. A descriptive analysis was conducted using the trade indicators and annual values reported from International Trade Centre Trade Map, with national coconut-production information from FAOSTAT providing contextual background. Revealed Comparative Advantage (RCA) was used to describe export specialization, Revealed Symmetric Comparative Advantage (RSCA) to express the same pattern on a symmetric scale, Export Competitiveness Index (ECI) to describe year-on-year market-share changes, and unit value to compare export value per tonne. Both countries recorded RCA values above one throughout the period. Indonesia's RCA declined from 58.10 in 2015 to 5.17 in 2023 before recovering to 8.89 in 2024; Thailand's RCA rose from 6.53 in 2015 to 37.95 in 2023 and was 34.80 in 2024. In 2024, Indonesia's ECI was 1.67, compared with Thailand's 0.82, while Indonesian export volume exceeded Thai volume. Indonesian unit values were consistently lower, reaching US\$298.22 per tonne versus US\$837.87 per tonne for Thailand in 2024. These findings identify different patterns of specialization, annual market-share change, and export unit value, but do not directly establish differences in product quality or production efficiency.

Keywords: agricultural exports; China; coconut; export competitiveness; unit value.

INTRODUCTION

Coconut is an important tropical agricultural commodity with multiple uses in food consumption and processing. The competitiveness of coconut exports depends not only on the scale of domestic production but also on the ability of exporters to participate in specific markets and product segments. Coconut value-chain research highlights the importance of coordination, marketing, processing, and product differentiation along the supply chain (Zainol *et al.*, 2023). For agricultural exports, a clear distinction is needed between observed trade specialization, annual changes in market

share, and price-related indicators (Mizik, 2021; Constantin *et al.*, 2023).

China is a relevant destination for fresh coconuts supplied by Indonesia and Thailand. The present study focuses on fresh coconuts in the inner shell, classified under the six-digit Harmonized System code HS 080112, rather than all coconuts or all coconut-based products. A narrowly defined product category is essential for ensuring that comparisons are based on the same reported commodity. Annual bilateral trade observations obtained from International Trade Centre (ITC) Trade Map provide the basis for the country comparison (International Trade Centre, 2025).



Indonesia and Thailand have distinct coconut production systems and marketing contexts. Indonesia has a comparatively large national coconut production base, whereas Thai agricultural marketing includes differentiated aromatic coconut products. Nevertheless, national production totals cover a broader range of coconut uses and should not be interpreted as the exportable supply of HS 080112. In addition, characteristics of a particular coconut cultivar cannot be assumed to describe every export transaction within the HS category (Food and Agriculture Organization of the United Nations, 2025; Steckley, 2026).

Previous studies of Indonesian coconut products have evaluated international competitiveness from broader or different commodity perspectives. Naufal and Suprehatin (2021) addressed coconut competitiveness in world markets; Tambunan *et al.* (2024) evaluated crude coconut oil exports, while Selina *et al.* (2024) considered desiccated coconut exports to China. These findings provide useful context, but different products and geographic market definitions limit direct comparability with the HS 080112 fresh-coconut market.

Trade competitiveness is multidimensional, and an individual index does not measure all aspects of market performance. Revealed Comparative Advantage (RCA) identifies relative export specialization using observed trade shares (Balassa, 1965). Revealed Symmetric Comparative Advantage (RSCA) rescales RCA onto a symmetric interval and should not be interpreted as an independent test of competitiveness (Dalum *et al.*, 1998; Laursen, 2015). Annual changes in market share and export unit value provide complementary, but conceptually different, perspectives (Mizik, 2021; Zdráhal *et al.*, 2023).

Interpreting differences in export unit values also requires caution. A value-to-quantity ratio represents an average

recorded value per unit, not a directly measured, quality-adjusted price. Research on agricultural trade shows that observed export prices may vary with product composition, transport costs, markups, market destinations, and quality, so differences in unit value alone cannot isolate product quality or production efficiency (Chen & Juvenal, 2022; Fiankor, 2023; Fiankor *et al.*, 2024). This distinction is especially important when comparing exporters serving potentially different segments of the same broad HS category.

The contribution of the present study is a destination-specific descriptive comparison of Indonesian and Thai exports of HS 080112 to China over 2015–2024, combining comparative-advantage indices, annual market-share changes, export volumes, and unit values. The objective is to compare the trajectories of revealed export specialization and market performance, while interpreting the economic limitations of the selected indicators. The study does not test causal effects of cultivar, quality, production conditions, or trade policy.

MATERIAL AND METHODS

Study Design, Period, and Data Sources

A descriptive quantitative approach was applied to annual observations for 2015–2024. The analysis used secondary trade information reported in the original manuscript as originating from ITC Trade Map, with supporting national production context from FAOSTAT. The destination market was China, the exporters were Indonesia and Thailand, and the commodity was fresh coconuts in the inner shell (HS 080112). The original manuscript identifies a March–May 2026 research period; this refers to study preparation rather than the 2015–2024 observation period. The database extraction date, original bilateral trade-value series, and exact reporter/partner conventions were not provided and



require confirmation against the source data before submission.

Variables and Analytical Framework

The underlying trade variables described in the original study were each exporting country's HS 080112 export value to China, its total export value to China, China's import value of HS 080112 from the world, China's total import value from the world, and country-specific export quantities to China. Export value and import value were expressed in current US dollars and quantities in tonnes for the unit-value calculation. No inferential statistical tests or causal models were reported for these annual trade series.

Revealed Comparative Advantage and RSCA

The destination-specific RCA applied in the original study compares the share of the focal product in an exporter's exports to China with the share of that product in China's total imports. The original analytical definitions are retained:

$$RCA_{it} = \frac{\left(\frac{X_{ijt}}{X_{int}}\right)}{\left(\frac{M_{jt}}{M_{nt}}\right)} \quad (1)$$

where X_{ijt} is exporter i 's value of HS 080112 exports to China in year t , X_{int} is exporter i 's total exports to China, M_{jt} is China's total HS 080112 imports from all origins, and M_{nt} is China's total imports of all commodities. RCA greater than 1 indicates an above-benchmark representation of the focal commodity in the exporter's China-bound export basket (Balassa, 1965). This bilateral, destination-specific formulation is not interchangeable with a conventional world-market RCA.

$$RSCA = \frac{(RCA - 1)}{(RCA + 1)} \quad (2)$$

RSCA ranges between -1 and $+1$, with positive values indicating RCA above 1. Because RSCA is

deterministically derived from RCA, it serves as a symmetric representation of the same specialization information (Dalum et al., 1998; Laursen, 2015).

Export Competitiveness Index and Unit Value

$$ECI = \frac{\left[\left(\frac{X_{ij}}{\bar{X}_{iw}}\right)t\right]}{\left[\left(\frac{X_{ij}}{\bar{X}_{iw}}\right)t - 1\right]} \quad (3)$$

The study's ECI is defined as the ratio of exporter's value-based share of China's HS 080112 imports in the current year to that share in the preceding year. Values above 1 show annual share growth; values below 1 show a decline. The definition describes growth in market share, not the absolute market share or a causal measure of competitiveness. A value for 2015 requires 2014 trade data, which were not documented in the manuscript; therefore, the 2015 point in the original ECI figure is retained only as a reported value pending verification.

$$\text{Unit Value}_{it} \left(\frac{\text{US\$}}{\text{tonne}} \right) = \frac{\text{Export Value}_{it} \left(\frac{\text{US\$}}{\text{tonne}} \right)}{\text{Export Quantity}_{it} (t)}$$

Unit value is treated as an aggregate export value per tonne. It does not by itself measure a quality-adjusted market price, operating cost, profit margin, or product standard. The limitations of such measures in agricultural trade have been discussed in Fiankor et al. (2021), Chen and Juvenal (2022), Valera et al. (2023), and Fiankor et al. (2024).

Data Presentation and Quality Considerations

The source manuscript provided complete annual RCA, RSCA, and unit-value tables and two figures for trade volume and ECI. Those reported values are preserved below. Some ECI observations are available only in the original graphical display or narrative rather than as a complete numeric table; values not explicitly tabulated or stated in the original source are not reconstructed or



invented. Numerical indicator outputs require final reconciliation with the underlying ITC Trade Map export and import series

RESULTS AND DISCUSSION

Export Volume and Market Dynamics

The original volume series shows a marked change in the relative position of the two exporters (Figure 1). In 2015, Indonesia exported 205,427 tonnes of the studied commodity to China, compared

with 11,202 tonnes for Thailand. By 2023, Thailand recorded 589,223 tonnes and Indonesia 363,534 tonnes. In 2024, Indonesian volume rose to 387,171 tonnes, while Thai volume fell to 340,972 tonnes. These observations demonstrate changes in the volume ranking of the two suppliers, but volume alone cannot determine comparative advantage, the annual growth of value-based market shares, or product quality. Figure 1 illustrates the reported annual export-volume trajectories of both countries.

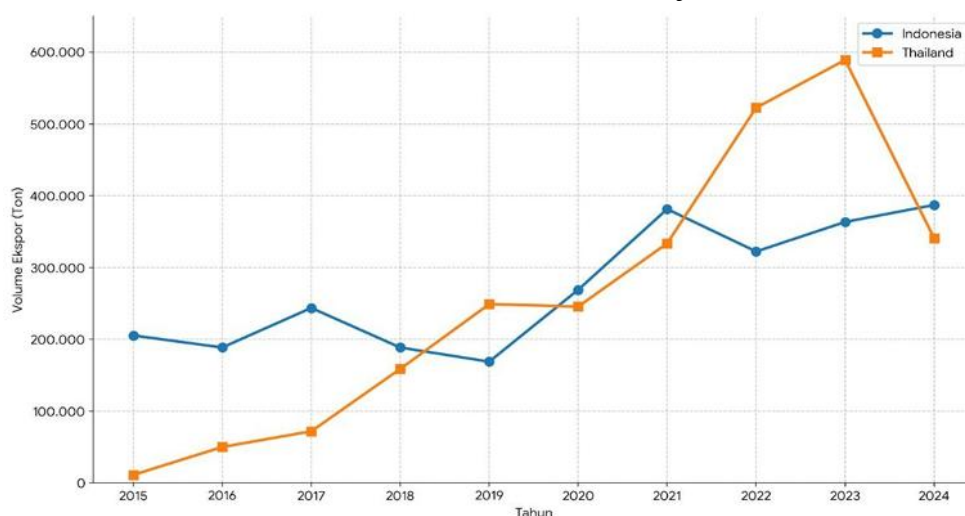


Figure 1. Export volume of fresh coconuts in the inner shell (HS 080112) from Indonesia and Thailand to China, 2015–2024.

The observed rise and fall in export volumes may coincide with changes in demand, supply, trade access, or product composition. However, the present data do not isolate which of these factors caused the change. Trade literature indicates that agricultural market performance can be influenced by standards and transaction costs, among other factors (Tchakounte & Fiankor, 2021; Fiankor et al., 2024).

Revealed Comparative Advantage and Symmetric Transformation

Table 1 summarizes the RCA and RSCA values reproduced from the original study using ITC Trade Map data. Both exporters recorded RCA values above 1 throughout the ten-year period, although the trajectories differed. Indonesia started with considerably greater destination-specific specialization in 2015, whereas Thailand had higher RCA values from 2018 through 2024.

Table 1. RCA and RSCA of HS 080112 exports to China, 2015–2024

Year	RCA Indonesia	RCA Thailand	RSCA Indonesia	RSCA Thailand
2015	58.10	6.53	0.966	0.734
2016	37.39	15.23	0.948	0.877
2017	37.46	16.44	0.948	0.885
2018	16.74	30.31	0.887	0.936
2019	7.09	32.20	0.753	0.940
2020	13.29	28.46	0.860	0.932
2021	10.90	27.31	0.832	0.929
2022	5.68	35.03	0.701	0.944
2023	5.17	37.95	0.676	0.949
2024	8.89	34.80	0.798	0.944

Indonesia's RCA decreased from 58.10 in 2015 to 5.17 in 2023 before increasing to 8.89 in 2024. By contrast, Thailand's RCA rose from 6.53 in 2015 to 37.95 in 2023, followed by a modest decline to 34.80 in 2024. RSCA illustrates the same trajectory on the symmetric scale: Indonesia fell from 0.966 to 0.676 between 2015 and 2023, while Thailand remained near 0.93–0.95 after 2018. The latter pattern supports a descriptive statement of relative stability in revealed specialization, not evidence of superior product quality.

These findings differ in scope from a global comparison of Indonesian coconut exports (Naufal & Suprehatin, 2021). Such differences should not be considered contradictory without checking the exact product codes, benchmark trade basket, and destination markets. As emphasized by Laursen (2015) and Mizik (2021), revealed

comparative advantage describes observed trade specialization and does not directly quantify technological efficiency or profitability.

Annual Changes in Export Market Share: ECI

The study calculated ECI as the ratio of consecutive annual value-based market shares. Figure 2 preserves the source manuscript's plot; the vertical scale represents the proportional change in market share, not the level of the share. The narrative reports that Indonesia's ECI was 0.50 in 2018 and 0.48 in 2019, before increasing to 2.09 in 2020. It later declined to 0.63 in 2022 and 0.93 in 2023, then rose to 1.67 in 2024. For Thailand, the reported values include 1.71 in 2018, 1.10 in 2019, 0.95 in 2020, 0.94 in 2021, 1.16 in 2022, 1.04 in 2023, and 0.82 in 2024. The originally presented ECI series is reproduced in Figure 2.

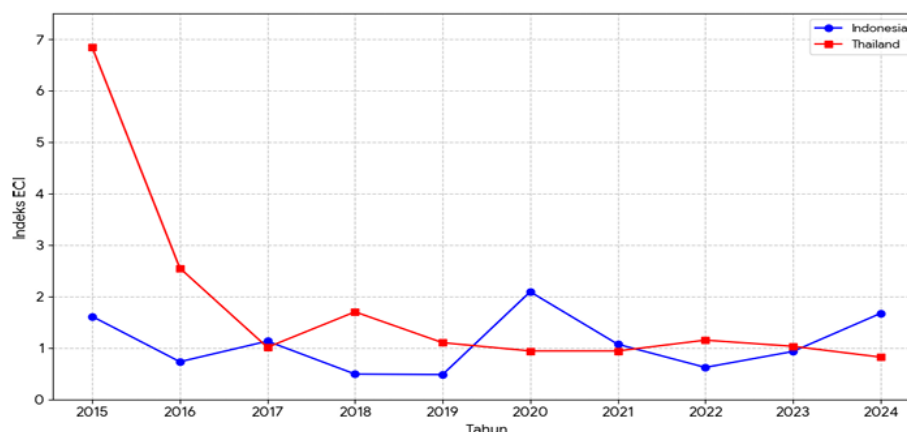


Figure 2. Reported Export Competitiveness Index for Indonesian and Thai fresh-coconut exports to China, 2015–2024.

Indonesia’s ECI of 1.67 in 2024 implies an increase in its reported value-based share relative to 2023, whereas Thailand’s ECI of 0.82 indicates a decrease. These changes do not by themselves show that Indonesia had a stronger comparative advantage in 2024: Table 1 shows RCA of 8.89 for Indonesia and 34.80 for Thailand. Likewise, a relatively high ECI can occur from a small initial market share. The complete, source-verified annual ECI values and their

underlying trade values should be supplied from the original calculation worksheets before final publication.

Export Unit Values

The original unit-value series is presented in Table 2. Indonesia had lower recorded export value per tonne than Thailand in every year observed. The reported gap was US\$998.04 per tonne in 2015, decreased over time, and was US\$539.65 per tonne in 2024.

Table 2. Export unit values of HS 080112 from Indonesia and Thailand to China (US\$/tonne)

Year	Indonesia	Thailand	Difference
2015	282.27	1,280.31	998.04
2016	287.34	935.64	648.30
2017	329.09	859.26	530.17
2018	257.52	813.19	555.67
2019	195.69	808.34	612.65
2020	256.04	773.62	517.58
2021	306.06	851.48	545.42
2022	286.99	796.94	509.95
2023	240.54	743.72	503.18
2024	298.22	837.87	539.65

For example, in 2023, Indonesia’s unit value was US\$240.54 per tonne and Thailand’s was US\$743.72 per tonne; in 2024, the corresponding values were US\$298.22 and US\$837.87 per tonne. These comparisons support a finding of lower average declared export value per tonne for Indonesia. They do not establish that Indonesian coconuts were cheaper at the same quality level, that Thai coconuts were uniformly superior, or that Indonesian exporters were more efficient. Unit values may reflect product mix, shipment characteristics, markups, and trade-related costs (Fiankor et al., 2021; Chen & Juvenal, 2022; Fiankor, 2023).

Differences in agricultural-product standards and product differentiation can matter for export trade, but these effects require separate quality and market-access data to be identified. The available evidence therefore supports a cautious policy implication: efforts to strengthen Indonesia’s position could consider improving consistency of grading,

postharvest handling, and market information, without implying that the observed unit-value gap alone demonstrates an existing quality deficit (Zainol et al., 2023; Fiankor et al., 2024).

Integrated Interpretation and Limitations

Taken together, the three indicator groups provide complementary information. RCA and RSCA describe specialization relative to a destination benchmark; ECI describes year-on-year changes in value-based import share; unit value summarizes export value per tonne. In 2024, Indonesia recorded an ECI above 1 and higher reported export volume than Thailand, while Thailand retained the higher RCA and export unit value. These findings are not mutually inconsistent because they refer to different economic dimensions (Mizik, 2021; Constantin et al., 2023; Wainaina & Gültekin, 2023).

Several limitations remain. First, the underlying export-value and China-import-value observations and complete



ECI numeric series were not supplied with the manuscript, which restricts independent recalculation. Second, verification of the first ECI year requires the 2014 baseline. Third, country-level production information does not represent HS 080112 export-ready volume. Finally, the study did not observe product grades, varieties by consignment, export contract terms, logistics costs, or quality-adjusted prices. Accordingly, possible influences of drought, pests, competition from Vietnam, product differentiation, and changes in Chinese demand are contextual hypotheses rather than established causal findings. Future work may link verified trade series to quality or shipment information where available.

CONCLUSION

The 2015–2024 comparison shows that both Indonesia and Thailand maintained revealed comparative advantage in HS 080112 exports to China, although the trajectories differed. Thailand had higher and relatively stable RCA and RSCA values after 2018, whereas Indonesia's specialization weakened relative to 2015 but partly recovered in 2024. Indonesia's reported ECI of 1.67 and higher export volume in 2024 indicate an improved year-on-year market-share position and a higher shipment volume for that year; neither result overturns Thailand's higher RCA in 2024. Indonesian export unit values remained lower throughout the study period. These descriptive observations can inform market monitoring and commodity-development decisions, but do not directly measure differences in product quality, production efficiency, or causal determinants of export performance. Confirmation of the underlying trade series, including the 2014 ECI baseline, is needed for full reproducibility.

REFERENCES

- Balassa, B. (1965). Trade liberalisation and “revealed” comparative advantage. *The Manchester School*, 33(2), 99–123. <https://doi.org/10.1111/j.1467-9957.1965.tb00050.x>
- Chen, N., & Juvenal, L. (2022). Markups, quality, and trade costs. *Journal of International Economics*, 137, 103627. <https://doi.org/10.1016/j.jinteco.2022.103627>
- Constantin, M., Sapena, J., Apetrei, A., & Pătărlăgeanu, S. R. (2023). Deliver smart, not more! Building economically sustainable competitiveness on the ground of high agri-food trade specialization in the EU. *Foods*, 12(2), 232. <https://doi.org/10.3390/foods12020232>
- Dalum, B., Laursen, K., & Villumsen, G. (1998). Structural change in OECD export specialisation patterns: De-specialisation and “stickiness”. *International Review of Applied Economics*, 12(3), 423–443. <https://doi.org/10.1080/02692179800000017>
- Fiankor, D.-D. D. (2023). Distance to destination and export price variation within agri-food firms. *European Review of Agricultural Economics*, 50(2), 563–590. <https://doi.org/10.1093/erae/jbac018>
- Fiankor, D.-D. D., Curzi, D., & Olper, A. (2021). Trade, price and quality upgrading effects of agri-food standards. *European Review of Agricultural Economics*, 48(4), 835–877. <https://doi.org/10.1093/erae/jbaa026>
- Fiankor, D.-D. D., Dalheimer, B., Curzi, D., Hoffmeister, O., & Brümmer, B. (2024). Does it matter how we ship the good apples out? On specific tariffs, transport modes, and agricultural export prices. *Agricultural Economics*, 55(3), 498–514. <https://doi.org/10.1111/agec.12829>
- Food and Agriculture Organization of the United Nations. (2025). FAOSTAT statistical database. <https://www.fao.org/faostat/en/>



- International Trade Centre. (2025). Trade Map: Trade statistics for international business development [Database]. <https://www.trademap.org/>
- Laursen, K. (2015). Revealed comparative advantage and the alternatives as measures of international specialization. *Eurasian Business Review*, 5(1), 99–115. <https://doi.org/10.1007/s40821-015-0017-1>
- Mizik, T. (2021). Agri-food trade competitiveness: A review of the literature. *Sustainability*, 13(20), 11235. <https://doi.org/10.3390/su132011235>
- Naufal, R., & Suprehatin, A. (2021). Daya saing produk kelapa Indonesia dan eksportir kelapa utama lainnya di pasar global. *Jurnal Agribisnis Indonesia*, 9(1), 1–14.
- Selina, A., Tain, A., & Bakhtiar, A. (2024). Analisis daya saing ekspor kelapa kering (desiccated coconut) di pasar China. *Jurnal Ekonomi Pertanian dan Agribisnis*, 8(1), 45–58.
- Steckley, M. (2026). Deepening the ecological agrarian question: How ecologies of production shape capital accumulation, subsumption and producer agency in the Thai Nam Hom coconut industry. *The Journal of Peasant Studies*, 53(2), 350–372. <https://doi.org/10.1080/03066150.2025.2519636>