



Assessing Cambodia's Agricultural Export Competitiveness: An Application of the Revealed Comparative Advantage (RCA) Index

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Abstract: The Balassa Index illustrates Cambodia as having an intense and narrow agricultural export profile. The paper quantitatively analyses five main products such as rice, cashew nuts, cassava, bananas, and rubber. The research finds that Cambodia has a Revealed Comparative Advantage (RCA) in all of them. This is specially the case for cashew nuts (RCA: 143.1), rubber (RCA: 33.5), and rice (RCA: 11.2); which gives them a far more competitive standing in global markets for those products. Increased competitiveness is also found in bananas and, to lesser extent, cassava. Such results are direct confirmation of the theoretical predications for comparative advantage; which suggest that Cambodia's export structure should look like it does give its endowment in land and labour. These relationships are significant for policy, indicating that strategic investments into the value chains of these high-performance industries could potentially unlock additional export competitiveness as well as economic growth and rural livelihoods.

Keywords: Revealed Comparative Advantage, Agricultural Exports, Cambodia, Trade Competitiveness, and Balassa Index

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1 | INTRODUCTION

Drawing on the theoretical framework upholding international trade, our paper evaluates agricultural export competitiveness in Cambodia using the Revealed Comparative Advantage (RCA) index. The RCA developed by Bela Balassa is a useful empirical criterion to ascertain which sectors of an economy may be competitive in world markets, as it compares the export structure of countries relative to that of the world. For an emergent economy such as Cambodia with a strong agricultural base, numerically high contribution to GDP and employment, knowledge of these competitive dynamics is important for planning and the strategic development of its economy. Although the RCA matrix has been used to analyse agricultural sectors in neighbouring SEA countries, such as Vietnam and Thailand, research on a comprehensive and multifactor analysis of the most important agricultural exports from Cambodia, including diversification indices, has not been conducted. Generally, the literature discusses only one commodity, such as rice, and overlooks other critical products like cashew nuts, cassava, bananas, and rubber in relative terms. This gap is what this study attempts to address by quantitatively, descriptively, and relatively analysing RCA of Cambodia within these five agricultural commodities. This paper, therefore, aims to offer a clear and empirical analysis of Cambodia's export diversification by taking advantage of the latest secondary trade data as well as the widely used Balassa Index. The results are meant to inform the country's competitive position in regional and global markets and therefore provide important inputs for policymakers to adjust policies on investment, market access, and the sustainable growth of agricultural exports.

This study focuses to what extent does Cambodia hold a Revealed Comparative Advantage (RCA) in its key agricultural exports, and what is the relative strength of this advantage across different products?

The objective of this research is to quantitatively measure and comparatively analyze the export competitiveness of Cambodia's key agricultural sector using the Balassa Index of Revealed Comparative Advantage (RCA).

2 | LITERATURE REVIEW

2.1 | Theoretical Foundations

According to the classic theory of comparative advantage developed by David Ricardo in 1817, countries profit from trade by producing goods for which they have a comparative advantage. This is the law that even if one country can produce all goods more efficiently than another, trade will still make both better off provided each good as a relative factor productivity by which that lower-productivity country is relatively efficient compared to another good (Singh & Singh, 2023). Through specialisation and trade, the consumption of countries exceeds their individual production possibilities, thereby improving welfare for all trading partners in international

transactions (Buranger & Chaddha, 2008; Altzinger & Damijan, 2009). However, there are some disadvantages to this method, especially when it comes to observable productivity differences; which seem to be merely speculative. Ricardo's model, which simplifies interacting characteristics to focus on a single element determining the trade pattern, makes no allowance for the many other effects, like technological differences and chromosomal endowments, that might lead to such deviations (Gulob & Hsieh, 2000; Hoen & Oosterhaven, 2006). Emphasising labour as an exclusive productive agent can prevent the formation of a more complex understanding of trade mechanisms in today's integrated trading world (Pointsoot, 2021). Critics contend the comparative advantage framework oversimplifies the more complex multidimensional measure of productivity in a contemporary environment (Meoqui, 2021; Selvaratnam, 2018). The fact that opportunity costs and productivity differences are sometimes hard to observe and measure makes Ricardo's theory quite impracticable in reality (Hoang et al., 2017; Altzinger & Damijan, 2009). Since international trade is more and more based on a variety of goods and services, it is essential to focus on how comparative advantage develop. This knowledge is useful for developing a broader mental model of trading relationships and complex issues in international macroeconomics (Ye et al., 2025; Nitzan, 2011).

2.2 | The Heckscher-Ohlin Model

According to Heckscher-Ohlin model, a country's comparative advantage is largely based on the natural endowments of land, labour, and capital. This theory suggests that countries will specialise in producing commodities that utilize their relatively more abundant factors of production more intensively. Land-abundant, labour-rich economies like Cambodia are anticipated to specialise in land-intensive food and agricultural industries. With the availability of land and a relatively large rural population, Cambodia should, in principle, possess a comparative advantage in some agricultural activities that can exploit its resources such as wet rice production and similar crops. Empirical evidence certainly suggests that countries export more commodities depend heavily on their relatively abundant production factors (Katzman, 1975; Fessler, 2020). In areas where specialisation in agriculture matches with relative land-labour endowments. The relationship is indeed evident, indicating that the Heckscher-Ohlin theorem can be relied upon to drive a priority sectoral specialisation pattern (Debaere, 2003). Moreover, the implications of our model are not confined to prediction. It has surprising evidence from agriculture that endowment specialisation shifts extend across setting; which suggests the ongoing relevance of factor endowments for understanding world trading patterns (Afkhan et al., 2018; Tombazos et al., 2005). The Heckscher-Ohlin model, is not, strictly speaking, a single equation. In fact, it can even be said to be more of a theoretical framework than an actual model. Here are the key equations of the Heckscher-Ohlin model:

2.2.1 | The fundamental basis: Factor Abundant

a) Physical Definition

$$\frac{K_{Home}}{L_{Home}} < \frac{K_{Foreign}}{L_{Foreign}}$$

That is, the home country has a lower capital-to-labour ratio than the foreign country.

b) Price Definition

$$\left(\frac{w}{r}\right)_{Home} < \left(\frac{w}{r}\right)_{Foreign}$$

This says that the home's wage, w , is abundant (the relative price of labour, r) and is lower at home than when trade starts. This due to rich factor is cheaper.

i) Factor Intensity

The factor intensity of a commodity is also relative, measuring the capital-labour ratio applied in its production to that in other commodities when their factors' prices are identical.

$$\left(\frac{K}{L}\right)_{Steel} > \left(\frac{K}{L}\right)_{Textiles}$$

This inequality is that the capital intensive good and textiles is the labour intensive good. There is no factor intensity might reverse in these countries.

ii) The core Heckscher-Ohlin Theorem (Prediction)

Plugging these definitions into the two equations above, we obtain the main prediction of the model:

If: $\frac{K_{Home}}{L_{Home}} < \frac{K_{Foreign}}{L_{Foreign}}$ (Home is labour-abundant)

And $\left(\frac{K}{L}\right)_{Steel} > \left(\frac{K}{L}\right)_{Textiles}$ (Steel is capital-intensive, Textiles labour-intensive)

Then, Home Country, which has excess of labour will export textiles and import steel.

In a formula, the exporter net export vector is given by a country is a net exporter of items which use its abundant factor intensively.

iii) Key Implications and Their Formulas

a) Factor Price Equalisation Theorem

Under the strict assumptions of the H-O model, free trade in goods leads to the equalisation of factor prices between two countries.

$$\begin{aligned} \text{Pre-Trade} & \left(\frac{w}{r}\right)_{Home} < \left(\frac{w}{r}\right)_{Foreign} \\ \text{Post-Trade} & \left(\frac{w}{r}\right)_{Home} = \left(\frac{w}{r}\right)_{World} = \left(\frac{w}{r}\right)_{Foreign} \end{aligned}$$

This implies that wage rate (w) and the rental rate on capital (r) converge to a single world price.

b) Stolper-Samuelson Theorem

This theorem explains the income distribution effects of trade. It establishes a magnified relationship between output prices and factor prices.

$$\frac{\hat{w}}{\hat{r}} > \frac{\hat{P}_{Textiles}}{\hat{P}_{Steel}}$$

More specifically, an increase in the price of a labour-intensive good (textiles) lead to

- A larger percentage increase in the wage rate (w);
- A decrease in the rental rate on capital (r)

$$\hat{w} > \hat{P}_{Textiles} > \hat{P}_{Steel} > \hat{r}$$

This formula shows "magnification effect", the abundant factor (labour) gains in real terms and the scarce factor (capital) loses in real terms.

c) Rybczynski Theorem

This theorem explains what happens when a country's factor endowment change. At constant relative goods prices, an increase in the endowment of one factor will lead to:

- A more than proportional increase on the output of the good that uses that factor intensively;
- An absolute decrease in the output of the other good.

If the labour endowment increases ($\uparrow L$):

$$\frac{\hat{Q}_{Textiles}}{\hat{Q}_{Steel}} > \frac{\hat{L}}{\hat{K}}$$

Or more starkly:

$$\hat{Q}_{Textiles} > \hat{L} > 0 > \hat{Q}_{Steel}$$

This shows. That the output of the labour-intensive good (textiles) expands massively, while the output of the capital-intensive good (steel) actually shrinks.

2.3 | The Birth of Revealed Comparative Advantage

advantage in international trade that first developed by Bela Balassa. This development served two purposes: first, to develop a systematic way of measuring and quantifying the competitive position of a country based on what can be observed from trade patterns rather than just assumed from underlying economic conditions (Balassa, 1977). The RCA index developed by Balassa offers analysts information about how a country's exports perform compared to the world market that reveal the comparative advantage whose analysis may not be apparent when working with theoretical model only. Fundamentally, RCA refocuses the lens of analysis by moving from a theoretical perspective to real international trade data and show how comparative advantage exhibits in the trading structure. Rather than using theoretical determinants, such as factor endowment, RCA compares the relative shares of a particular commodity in a country's export with the respective total world shares for that commodity. This empirical sensitivity is well in line with the Ricardian trade theory; where trade patterns would express latent production efficiencies (Obadi, 2017; Mizik & Balogh, 2022). The Balassa Index is defined as:

$$RCA_{cp} = \frac{\frac{E_{cp}}{E_c}}{\frac{E_w}{E_p}}$$

Where:

- RCA_{cp} = Revealed Comparative Advantage of country c in product p
- E_{cp} = Exports of country c in product p
- E_c = Total exports of country c (all products)
- E_{wp} = World exports of product p
- E_w = Total world exports (all products and all countries)

Balassa's RCA measurement has also been used in practice and was incorporated into numerous empirical studies; which demonstrate how trade structures illustrate the competitiveness of countries in various product groups (Ferlej & Kubala, 2018; Kathuria, 2013). Overall, Balassa's research has fostered a substantial literature on comparative advantage, having created an index that is still widely used in the study of international trade patterns.

2.4 | The Revealed Comparative Experience index

The Revealed Comparative Advantage (RCA) index is key for measuring the competitively specialized position of countries in international trade as it contrasts normalised export shares with a set of reference countries. RCA indicates the comparative advantage or disadvantage of a sector and is used as a basic tool for help determine industry performance. More precisely, $RCA > 1$ implies that a country has a comparative advantage in an industry, $RCA = 1$ implies neutrality, and $RCA < 1$ suggests disadvantage. This classification is used in different studies to better comprehend trade statistics and sectoral comparative advantages and disadvantages. Between countries (Singh et al., 2023; Kilicarlan, 2021). The RCA analysis is reliable and commonly used. It helps researchers to compare a target country with its regional competitors or global spectator. In the context of agricultural field, researcher has employed an RCA to map out how countries are strategically situating themselves in a world that is increasingly competitive (Aguar & Maria, 2023; Aguiar & Balogh, 2022). More advanced comparisons to measure the potency of shrimp exports from Thailand and Vietnam use RCA as a tool for identifying the advantages and limitations that are relative to international trade standards and regional competitors (Pakdeeteva et al., 2025). RCA allows for comparisons of country performance in regional evaluations. It provides an indication that countries are improving their economic strategies. It has shown that the RCA index can

help reveal changes in comparative advantages through time by sectors, directing policy implications in different countries such as China (Vaidya et al., 2007). The use of RCA to measure the level of export competitiveness not only provides guidelines for government policies but also helps businesses to establish their comparative advantage in target markets (Kuwalska et al., 2021; Huo, 2014). The RCA index is finally an important international economics tool that allows countries to empirically observe and learn elements of trade while driving informed narratives at many economic levels.

The literature on RCA and its extensions represents ongoing attempts to correct this imbalance. The widely used RCA index, introduced by Balassa, is seriously criticised for its asymmetry. The range of the values is between 0 and 1 if a product has been a disadvantage to a country. But it can be above one and even infinite if advantageous for a country. This is a right-skewness feature symmetric version of RCA that are Revealed Symmetric Comparative Advantage (RSCA) (Pawlak, 2017; Vosta & Kocourek, 2015). The RSCA index addresses the problem of asymmetry by homogenising the values that are estimated in the classical RCA. Therefore, harmonising the dependent variables throughout sectors illustrating a country's comparative disadvantage or advantage (Vosta & Kocourek, 2015). Another key improvement is the RSCA's way of operating, which follows the lead of the economist Laursen and includes temporal dynamic measures to more persuasively account for changes in comparative advantage over time (Pawlak, 2017; Katzman, 1975). The RSCA has been empirically validated across various sectors and the economy, including analyses in agricultural markets that confirm its usefulness in different economic areas. Beyond this refinement, the calculation of economic indices also spreads to relational issues among other sarcastic indexes, as is the case of the Economic Complexity Index (ECI). The ECI uses the RCA, among other metrics, to measure how diverse a country's export basket is. This index is important because it captures not only the variety of but also the ubiquity of that country's exports. Hence, researchers can more robustly evaluate a nation's level of economic complexity (Bruyane et al., 2022; Cakir et al., 2021). Hidalgo and Huasman's (2009) original work on complexity upholds the recursive approach used to compute the ECI, which shows that running layers of sophistication in exports would be indicative of a country's overall economic capabilities (Cakir et al., 2021). Since the Symmetric contributes to RCA, the modified version of the latter is part of our ECI calculation, which improves our perception of trade complexity and of how economic competition dynamics occur at a global level (Bruyane et al., 2022; Cakir et al., 2021). By incorporating symmetric modifications into the RCA and taking it in connection with economic complexity, more reliable evaluations concerning comparative advantages can be drawn that helps policymakers as well as scholars develop informed economic strategy that corresponds to the subtle trade reality.

Despite the fact that RCA has been adopted widely in assessing economies' competitiveness compared with other countries in particular sectors, it is also full with critiques. A major criticism is its vulnerability to trade imbalances, where a country may import large volumes of commodities. Thereby, generate an apparently high risk or RA value. The index can also be dumbed down by high/low trade deficits or trade surpluses, thereby reducing its efficiency to reflect true comparative advantage (Saki et al., 2019; Mahmood, 2022). Moreover, the RCA is a measure that is also based on data aggregation levels, which may hide positive trade dynamics since it is usually computed at an HS 2-digit level and might undervalue some valuable information found at a more disaggregated classification like HS (6 digit). However, this pool combines the different products into homogenising categories that hide variations in true competitive deficit among these (Tampubolon, 2019; Buranger & Chaddha, 2008). A second major drawback of the RCA index is its static approach. The greedy index cannot be viewed as anything but a fixed-point measure of comparative advantage and without flexibility for changing trade conditions between markets over time. As a result, it could be unable to keep up with the changing patterns as well as structural shifts in economies (Ferto & Hubbard, 2003; Senguntar et al., 2025). Though, the RCA index shows relative specialisation in different sectors, it does not capture fundamental forces of profitability or efficiency that may act within separate activities. Their relative performance orientation relevance can deceive analysts so that they conclude high RCA is highly profitable, which does not go in all circumstances (Hasan & Das, 2024; Stefaniak & Kuczevska, 2016). While, the RCA index offers an alternative for capturing a country's competitiveness in trade, its flaws, which include vulnerability to trade balance, levels of data aggregation and being static necessitate further examinations that consider other factors affecting trade behaviour and economic performance (Guan et al., 2019; Kathuria, 2018).

2.5 | RCA in Agriculture: Global and Regional Outlooks

The Revealed Comparative Advantage (RCA) is an important workhorse when it comes to the analysis of global patterns in agricultural trade. It provides the opportunity for comparing individual nations, including

developed nations and developing countries, to learn in what way factor endowments affect the performance of trade. High-income countries are generally able to draw on their more sophisticated financial institutions and superior technologies, which enhance the relative advantage in high-value agricultural products. For example, Hanif and Jafri (2008) illustrate that an improved financial development can help in increasing competitiveness of processed agricultural products. Thus, emphasising the role of finance tools for the determination of comparative advantage. It is also indicating to mention Zhang and Sun (2019) in relation to the agro-competitiveness of new players in partner areas of the Belt and Road (B&R) initiative with different factor endowments. Their study applies the RCA and indicates that in some regions and sectors other than agriculture may perform better, while the potential for China and B&R countries to maintain comparative advantages in agricultural products is decreasing. It has been suggested that the factor endowments at home and the shifts in the trade environment along a path are both significant for trading dynamics (Zhang & Sun, 2022). Other empirical studies, such as Shuai and Xi (2011), have identified the complementary nature of US-China agricultural trade. Their findings demonstrated that the rate of export in these countries determined resource endowment and influenced trade interdependencies. The illustration of these dynamics would make it possible for policy to overcome comparative advantages, as evident in some developing countries with targeted interventions that utilise the unique comparative advantages which they possess (Urba et al., 2023). RCA is an important indicator of the comparative ability to produce in agriculture between developed and developing countries. Some researches proved that advanced countries have excellent infrastructures and technologies, while developing nations can move up by strategically using their specific agricultural strengths and adjusting in trade.

The RCA is an important tool to assess the competitiveness of agriculture in the ASEAN member countries and enables us to show regions of strengths and opportunities. Nowhere is this more salient as stakeholders attempt to measure Cambodia's agricultural development against ASEAN members such as Vietnam and Indonesia. Beginning with Lao PDR, evidence indicates that the RCA of the country contains a remarkable comparative advantage in rice, cassava and rubber farming. More precisely, it has been found that Lao PDR still possesses a strong comparative advantage in rice production. This because the outstanding ecology and traditional farming technology that is one of the reasons why its market share in the rice export markets can be sustained (Hoang et al., 2017). Furthermore, the expansion of cassava planting has received international attention as RCA assessment show that demand for it in foreign markets is becoming more important (Darmanto et al., 2021). On the other hand, the agricultural sector in Vietnam has remarkable RCA, especially for rice, coffee, and cashew nuts. According to reports, with affordable irrigation and established export channels, Vietnam is the second largest rice producer in the world (Hoang, 2020). The RCA for cashew nuts is not less compelling. Vietnam has successfully established itself as a major player in exports subsequent to its investment in processing technology and cultivation techniques that result in high-quality product on the world market (Hoang et al., 2017). The coffee industry, additionally, in Vietnam has benefited from worldwide trends, and its RCA performances have been reinforced by efforts towards quality enhancement and product diversification (Hoang, 2020). At the same time, the RCA of both palm oil and rubber in Indonesia is substantial, given their considerable presence on the Indonesian agricultural map. Palm oil is the strategic export commodity in Indonesia. It placed the country as a global leader in this commodity, which also supported by advanced infrastructure development and favourable trade agreements (Darmanto et al., 2021; Tety et al., 2022). The rubber industry also enjoys favourable RCA; supported by effective production processes in place and escalating global interest for sustainable rubber-based products (Tety et al., 2022). These transitions to lasting crops are also representative of a larger trend in Indonesia towards high value-added agricultural products based on comparative advantages from tropical agriculture (Darmanto et al., 2021). The synthesis of this paper proposes that Cambodia must be able to strategically explore and consider embracing its agricultural advantages. Because other countries in the region (e.g., Vietnam, Lao PDR) have comparative advantages in food crops, a targeted focus on varieties and market access could improve Cambodia's competitiveness against regional benchmarks.

2.6 | The Cambodia Case: Agriculture Exports and The Economic Growth

Agriculture has become one of the backbone sectors in the Cambodian economy, which heavily contributes to the GDP, employment and rural livelihood. Agriculture has long been a main pillar of the Cambodian economy, contributing about one-third (1/3) to the national GDP and providing employment for a huge percentage of its population. Agriculture supports an estimated 50% of the labour force. Rice is a major essence that largely impacts rural budgets and food security (Chinh & Millington, 2015; Gaiha et al., 2012). The dominance of rice illustrates the dual role the sector

plays in terms of economic performance and social stability. In 2015, rice contributed over 27.62% to the GDP of agriculture, fisheries and forestry in Cambodia (Chhinh & Millington, 2015). Chhinh & Millington (2015) continues to point that over 80% of Cambodians are living in rural areas. Smallholder farming would be the main activity with a scale of less than 1.4 hectares per farm. This dependence on traditional forms of agriculture exposes rural communities to external disasters caused by climate variation and market instability. Cambodia's readiness to promote its agricultural sector is reflected in its policy instruments, particularly the "Rectangular Strategy" announced in 2004. This approach focused on agrarian development as the economic basis with rural development and poverty reduction as the targets. The policy is designed to ensure continuous agricultural growth through increased productivity and competitiveness by encouraging financial methods which lower the operation cost of farmers (Ding, 2024). Ding (2024) continues to assert that there are successes, with Cambodia's regular income doubling to \$4.56 billion by 2018 from \$2.264 billion in 2013, indicating that policy with a structured approach affects the agricultural production positively. Regarding volatility within global trading dynamics, agricultural (dis)competitiveness between Cambodia and its neighbouring countries, especially China seems to be increasingly important based on research findings amid the post-COVID-19 period (Tao et al., 2025). This adaptability is an important trait in a country where agriculture is still very much of an economic force, supporting many families in the provinces. Farming is not just a statistic in Cambodia. It's the social glue of rural society. Schemes such as the Rectangular Strategy will help to protect jobs and increase output, thus protecting the long-term future of this industry. Regardless of the challenges and options for Cambodia to pursue together with its partners abroad there will also always be a need for developing agriculture as a key to overall economic resilience.

Although there are framework and documentation in place for neighboring countries, research has proven an absence of studies on agricultural exports from Cambodia. It has been applied to the analysis of agricultural element contents in various regional states. There is no comprehensive research and comparison of the primary exported agricultural products from Cambodia, including rice, cashew nuts, cassava, bananas, and rubber. Liu et al. (2020) conducted a study on this topic. The earlier work on Cambodia also revealed that the country has become increasingly competitive in the rice sector over time, whereas similar comprehensive studies of its RCA for its other major agricultural products are lacking (Khan & Ahmad, 2017; Liu & Gao, 2022). This difference illustrates the value of focused research that objectively examines and compares the export potentials of these key sectors in Cambodia's economy. There are still deficiencies, although differences in academic boundaries have evolved. Among these RCA-orientated studies, several are dedicated to one crop, namely rice. But there hasn't been the same level of research on an overarching strategy that embraces all the major staple crops as well as some others, like cashews, cassava, bananas and natural rubber. In the present study by Tao et al. (2025), the authors examine agricultural trading relations with Cambodia in general terms, but they do not compare specific commodities within these sectors or across different sectors. Many of the previous studies are outdated because they do not include currently available information. They do not have these five key items analysed together in their competitive landscape. For instance, in Cambodia evidence has been produced to suggest that rice is a strong competitor for the Cambodian domestic market, but little is known about how cashew nuts, cassava, bananas and rubber fare against rice in terms of revealed comparative advantage (RCA) and overall competitiveness in foreign markets. This is a lack that can be seen as an opportunity for more research to examine these areas and determine whether Cambodian agricultural exports are competitive in those subsectors. Therefore, the novelty of my research lies in its significant contributions by applying RCA to examining Cambodian rice, cashew nuts, cassava, bananas, and rubber at the same time. By filling these gaps found in the literature, my work will not only contribute to better comprehension of the competitiveness of Cambodian exports, but it can also be used as guidance for which sectors will get strategic attention and investment in the future from policymakers.

The Revealed Comparative Advantage (RCA) concept is an important theory to understand the pattern of international trade, especially in the agricultural sector. Such an approach has already been successfully used to study Southeast Asia, including in the assessment of a country's agricultural competitiveness (case of Vietnam and Thailand). It has been reported that these countries have built strong agricultural sector exports from the unique competitive advantages of specific crops (Hoang et al., 2017; Long et al., 2021), as shown in numerous comparative statistics. Recent evaluations in Vietnam have found large variations in the RCA indices in response to changes – indicating change under different agricultural policies and marketing systems (Long et al., 2021; Kea et al., 2020). Despite, the existing framework and satisfactory documentation for neighbouring countries, there is a research shortage regarding agricultural exports from Cambodia. The

RCA model has been successfully used to analyse agricultural components in the regional and global stand. However, comprehensive studies and comparisons of Cambodia's primary exported agricultural goods such as rice, cashew nuts, cassava, bananas, and rubber, are scarce. Liu et al. (2020) conducted a study on this topic. The earlier work on Cambodia also revealed that the country has become increasingly competitive in the rice sector over time, whereas similar comprehensive studies of its RCA for its other major agricultural products are lacking (Kea et al., 2020; Liu & Gao, 2022). This difference illustrates the value of focused research that objectively examines and compares the export potentials of these key sectors in Cambodia's economy. Thus, this study aims to fill the identified gap by providing a detailed quantitative assessment of the RCA for Cambodia's five major agricultural exports. By doing so, it will improve our knowledge about Cambodia's position in the regional agricultural market and inform policy directions for enhancing its agricultural export framework.

3 | RESEARCH METHODOLOGY

Section 3 outlines the research design, data sources and collection methods, analytical framework, and calculation procedures used to achieve the objective of the study. It is descriptive because it attempts to measure and describe the status of Cambodia's export competitiveness in selected agricultural products. Lastly, it is comparative, as it compares Cambodia's export structure to the world's export structure in order to calculate RCA indices and sort the products. A secondary analysis design is used for data collection.

Variables:

- V1: Values of particular products (E_{cp}): Number of Cambodian exports for each five commodities raw rice, cashew nut, cassava, bananas, and rubber;
- V2: Total exports of Cambodia ($\sum_p E_{cp}$): The aggregate value of total merchandise exports from Cambodia;
- V3: World value of specific products ($\sum_{c'} E_{c'p}$): The sum value of world exports for the five particular agricultural products;
- V4: World total exports ($\sum_{c',p'} E_{c'p'}$): The sum of all merchandise exports in the world.

Data are derived from credible international databases to maintain homogeneity and comparability. These include UN Comtrade, World Bank's World Integrated Trade Solution (WITS), and International Trade Center (ITC). Data are collected using standardised product classification codes (Rice: HS Code 1006; Cashew Nut: HS Code 0801; Cassava: HS Code 0714; Banana: HS Code 0803; and Natural Rubber: HS Code 4001). The core of the analysis is the calculation and interpretation of the Balassa Index of Revealed Comparative Advantage (RCA).

The Revealed Comparative Advantage (RCA) Index:

a) Formula

$$RCA_{cp} = \frac{(E_{cp}/\sum_p E_{cp})}{(\sum_{c'} E_{c'p}/\sum_{c',p'} E_{c'p'})}$$

Where;

RCA_{cp} = Revealed Comparative Advantage of Country (c) in product (p)

E_{cp} = Exports of country (c) for product (p)

$\sum_p E_{cp}$ = Country c's Total Exports (the sum of its exports across all products)

$\sum_{c'} E_{c'p}$ = World's exports of product (p) (the sum of product exports across all countries)

$\sum_{c',p'} E_{c'p'}$ = Total World's exports (the sum of all countries exports across all products)

b) Interpretation of the Ration

Numerator (Country's specialization)

$$\frac{E_{cp}}{\sum_{c'} E_{c'p}} \text{ This is the share of product (p) in country c's total exports}$$

Denominator (World specialization/Benchmark)

$$\frac{\sum_p E_{cp}}{\sum_{c',p'} E_{c'p'}} \text{ This is the share of product (p) in total World's exports}$$

c) Framework for Result Interpretation (Balassa Index)

RCA Value	Interpretation	Meaning
RCA > 1	Revealed Comparative Advantage	The country's share of this product in its own export basket is greater than the world's share of this product in its total export basket.
RCA = 1	Neural	The country's specialization for this product equal to the world average.
RCA < 1	Revealed Comparative Disadvantage	The country's share of this product in its own export basket is less than the world share. The country is not specialized in this product.

3.1 | Comparative Analysis

For ranking and dynamics understanding, we will carry out the analysis of product ranking by computing RCA for all 5 market products, they will be ranked in a descending order based on their RCA. This will distinguish the visually most robust (e.g., cashew nuts) and least developed (e.g., rubber) of Cambodia's export-based land use commodity sectors.

3.2 | Validity and Reliability

- **Validity:** Employing the widely adopted yardstick, namely the Balassa Index, provides construct validity. The use of the official HS codes for product descriptions ensures that the data is a true reflection of the products at stake.
- **Reproducibility:** The method is very reproducible. Utilising this same formula, with access to the same international databases (such as UN Comtrade), any other researcher could replicate their study and achieve the exact results, providing reliability.

3.3 | Limitations of the Methodology

Despite its robustness, this approach does not overlook some important assumptions.

Static Snapshot: The traditional RCA index, therefore, is a snapshot at some particular time from a competitive perspective. It doesn't tell us anything about the source of this advantage vis-à-vis policy, climate, or labour costs.

Issue of Symmetry: The index is not symmetrical about 1 (it varies from 0 to ∞), which causes an asymmetry in interpretation.

Data Limitations: The precision of the results depend exclusively on the accuracy and consistency of reporting in the secondary databases. Such a framework offers a precise, stepwise methodology to quantitatively address the research questions and reach all aims.

4 | FINDINGS

We estimate the Revealed Comparative Advantage (RCA) of a set of agri-food products, where we believe Cambodia has recently gained a comparative advantage. An RCA index larger than 1 means that Cambodia has a comparative advantage in the respective product.

4.1 | Standardise Data to Billion USD

Data Point	Cambodia (Billion USD) (E_{cp})	World Total (Billion USD) ($\sum_{c,p} E_{cp}$)
HS Code 1006	0.491	39.1
HS Code 0801	1.15	7.2
HS Code 0714	0.689	198.90
HS Code 0803	0.152	15.3
HS Code 4001	0.595	15.9
Total Exports	26.7 ($\sum_{c,p} E_{cp}$)	23,900 ($\sum_{c,p} E_{cp}$)

Such reports provide a benchmark for comparing standard costs in monetary terms. Cambodia's total exports (USD 26.7 billion) are a minimal proportion (around 0.1%) of total world exports (USD 23,900 billion), thus positioning Cambodia as a very minor player in the global export market. But the figures also point to a concentrated export profile in particular products. Value-wise, 0801 is Cambodia's highest export product, listed at \$1.15 billion, followed by HS Code 0714 and HS Code 4001.

4.2 | Calculate World Benchmark Ratios (Denominator)

The world's specialisation in each product

Product	World Exports (Billion USD)	Total World Exports (Billion USD)	World Benchmark (Ratio)
HS Code 1006	39.1	23,900	0.001636
HS Code 0801	7.2	23,900	0.000301
HS Code 0714	198.90	23,900	0.008322
HS Code 0803	15.3	23,900	0.000641
HS Code 4001	15.9	23,900	0.000665

This process sets the worldwide "reference" for expertise, indicating how much weight each product contributes to the world exports. The data shows that HS Code 0801 is the world's largest commodity of those listed, representing 0.83% of all global exports. The other products represent niche markets, being the smallest for HS Code 0801 (0.03% of world exports). These ratios set the standard against which Cambodia is being evaluated.

4.3 | Calculate Cambodia's Specialisation Ratio (Numerator)

Cambodia's Aggregate Exports ($\sum_{c,p} E_{cp}$) equal 26.7 billion USD.

Product	World Exports (Billion USD)	Total World Exports (Billion USD)	World Benchmark (Ratio)
HS Code 1006	39.1	23,900	0.001636
HS Code 0801	7.2	23,900	0.000301
HS Code 0714	198.90	23,900	0.008322
HS Code 0803	15.3	23,900	0.000641
HS Code 4001	15.9	23,900	0.000665

This is the relevance of each product within Cambodia's own exported merchandise. The corresponding structure is found to be very different from the average over the globe. Although HS Code 0801 are a small commodity traded in global markets, they are by far the most specialised product on this list, accounting for 4.3% of total exports in Cambodia. There is also substantial specialisation in HS Code 1006 and HS Code 4001 with respect to the Cambodian economy (1.8% and 2.2%, respectively) compared to their global interest. This shows a strategic focus on these particular sectors in agriculture.

4.4 | Final RCA Calculation and Interpretation

$$RCA = \frac{\text{Cambodia's Specialization}}{\text{World's Benchmark}}$$

Product	Cambodia's Specialization	World Benchmark	RCA Value	Interpretation (Advantage if RCA > 1)
HS Code 1006	0.01839	0.001636	11.24	Very strong advantage
HS Code 0801	0.04307	0.000301	143.09	Extremely strong advantage
HS Code 0714	0.02581	0.008322	3.10	Moderate advantage
HS Code 0803	0.00569	0.000641	8.88	Strong advantage
SH Code 4001	0.02223	0.000665	33.50	Very strong advantage

This is the ultimate finding of this research, which measures a comparative advantage of Cambodia.

- **Very Strong Advantage (RCA > 1):** In HS Code 0801, it holds the world's leading position (RCA: 143.1), and in HS Code 4001 and HS Code 1006 its RCA scores are 33.5 and 11.2, respectively. These values show that the export orientation towards these products is dozens to hundreds of times more pronounced in Cambodia than their global average. The sectors are thus highly competitive, and the exports they generate are globally relevant.
- **Strong Comparative Advantages (RCA 5-10):** HS Code 0803 (RCA: 8.9) again Table above. In most cases, there is a strong and clear comparative advantage; fruit crops may be three- to ten-times more specialised than the world benchmark.
- **Moderate 17:** HS Code 0714 (RCA:3.1) has the only moderate advantage (RCA 1-5). Unlike the other products discussed; Cambodia's relative advantage is less significant. The reason for this difference is partly that the cassava market is broader, more competitive and larger.

General Research Conclusion: Cambodia has a specialised agricultural export economy with a distinct comparative advantage in terms of all five focal products. Not only is the country a player, but it is a powerhouse in world markets for HS Code 0801 and HS Code 4001 and a large player in HS Code 1006 and HS Code 0803. This outward export profile shows that Cambodia has successfully focused on specific agricultural value chains where it holds a strong position in the world market.

5 | DISCUSSIONS

5.1 | Interpretation of Key Findings

The first specific finding in the study is that Cambodia has a strong comparative advantage (RCA > 1) in five important agriculture products: HS Code 1006, HS Code 0801, HS Code 0714, HS Code 0803, and HS Code 4001. This diagnostic provides an empirical-based assessment of Cambodia's export competitiveness and serves as a comparison, fulfilling the research purpose of identifying the country's strengths in these agricultural products. The RCA index is important because it permits a simple comparison between Cambodian export performance and the world in general. So, under Balassa's model, a country would have a comparative advantage in a product if its share of exports is larger than that good's own global export to the entire world, which is precisely what empirical results have shown for Cambodian

agricultural exports (Prasada & Dhamari, 2021). In refutation of these results, researchers have used the RCA index to investigate relative advantages in agriculture trade in different settings, i.e., the level of disparity between Cambodian and neighbouring agriculture (Tao et al., 2025). However, the RCA index is simple to calculate and interpret, so it has been frequently used as a tool of export competitiveness in agriculture (Tamien et al., 2011). For instance, Kea et al. (2020) have found that the RCA index indicates increasing competitiveness in agriculture. Tuek and Colin (2020) also explore the trend of RECI over time with respect to Cambodia. They found an increasing competitiveness over the past years, thus corroborating the findings of this paper that one country at least is becoming more competitive in exporting rice. The RCA index has proven to be a useful tool for analysing comparative advantages and disadvantages in the foreign trade of Cambodia's baskets, thanks to its wide application across many products and activities (Kowalska et al., 2021). However, since the RCA rate of five commodities in Cambodia is >1 , it will stimulate current competitiveness and future comparative advantage to expand and diversify product-marketed export trade into agricultural commodities (Fauziyah et al., 2017). Therefore, the most popular indicator to quantify Cambodia's agricultural commodities has been through the calculation of RCA, which provides a signal for useful information for the country in terms of export potential and trade policy against the world market.

Revealed comparative advantage (RCA) provides insight into how competitive a country is in the international market. RCA greater than 1 is typically interpreted as a comparative advantage, above 2 as strong and more than 5 as exceptional. This concept is illustrated by commodities like HS Code 0801, HS Code 4001, HS Code 1006, HS Code 0803 and HS Code 0714. Firstly, the impressive RCA of cashew nuts (143.1) reflects a comparative advantage in this industry at the global level, which suggests that exports of HS Code 0801 are much more specialised than products on average across the world [51]. This is a bold stance that reflects the nation's heavy reliance on this crop. Likewise, HS Code 4001 (RCA: 33.5) and HS Code 1006 (RCA: 11.2) hold strong with very high ranks in global markets where the specialisation coefficient exceeds that of the other by more than 33 times and is specialised by a factor of about 11 times (Tao et al., 2025). The strength of both these sectors demonstrates that they are an integral part of the nation's economic structure. In accordance with the RCA scale, HS Code 0803 (RCA: 8.9) have a much greater comparative advantage, being nearly nine times more prominent than the global benchmark (Tao et al., 2025). This indicates that it has had favourable agronomic and technological experiences, which support the production and exportation of HS Code 0803. The strong relative advantage in this sector is consistent with export-led agricultural strategies aimed at diversifying exports to support economic resilience. In contrast, HS Code 0714 has an intermediate RCA of 3.1. Although they have a comparative advantage. They tend to be weaker than that of the above commodities (Toai, 2025). It is symptomatic of the competitive HS Code 0714 market, which exists in a range of competing countries and ultimately has an impact on its comparative advantage. Competition calls for further focus on the next innovation and maybe on niche markets to sustain and improve this competitive advantage (Pramesti et al., 2018). While its global competitors are playing a relatively moderate role, HS Code 0714 continues to be strong at the domestic level, and monitoring for strategic interventions should remain in place. The interpretation of such RCA values is very significant in analysing a country's economic potentials towards the redefinition of its development policies. The HS Code 0801, HS Code 4001 and HS Code 1006 superiority may be the critical cornerstones for economic stability and development. The strong HS Code 0803 advantage provides prospects for agricultural export expansion. On the other hand, HS Code 0714's intermediary position emphasises the necessity to take appropriate measures towards improving its international position. Therefore, RCA is a fundamental tool that policymakers (and agricultural producers) can use to help them make informed decisions by identifying comparative advantages and market opportunities.

5.2 | The Theoretical Foundation and Connection to Economic Models

The RCA index is relevant for the empirical testing of Ricardian trade theory due to the fact that it can be numerically characterised as a relative indicator of production efficiency and specialisation in exports across sectors. And, more generally, where high RCA is observed, it already indicates that production is efficient and competition on the world market is strong (also against, for example, Cambodia). These results are in line with other efforts, which indicates that the calculated RCA is a product-based measure of observed trade patterns and not theoretical predictions. Here, the study could clarify that globalisation may be more practical from an economic policy perspective (Gupta & Kumar, 2017; Zhang & Sun, 2022). The RCA index (relative comparative advantage index) is an important indicator to be used for the analysis of relative advantages of a country when discussing the nature of its production and export flows. Tao et al. (2025) examine the RCA

index to identify sectors in which Cambodia has a comparative advantage, confirming export specialisation and production efficiency. This result is in line with the previous studies that the RCA can indicate how well a country manufactures certain products compared to other countries, and that will affect trade balance (e.g., Liu & Gao, 2022). In other words, the RCA index confirms that Ricardian trade theory and demonstrates some important empirical truths. Through relative export shares, it links the exports of a country to its global trade partners and represents an insightful measure of international competitiveness. This approach allows analysts and policymakers to single out sectors with desirable trade dynamics, informing strategic agricultural policies (Liew et al., 2021; Tao et al., 2023). Cambodian agricultural goods confirm this theoretical and empirical fusion, highlighting a competitive advantages space marked by the RCA index. Finally, the RCA indicators are a coherent frame for understanding and interpreting countries' comparative advantages. Due to the empirical evidence backing Ricardian theory by the RCA index, it also provides critical information about real trade flows—illustrating the competitive position of Cambodia in agricultural products in world markets.

The sectoral specificity of Cambodia; which specialises in the exports of products such as rice, rubber, and cassava, can be explained by its factor endowments—the country is rich in land and labour. Within this, the Heckscher-Ohlin model suggests that countries should export goods which use their plentiful factors of production and import goods which rely on less abundant conditions. For Cambodia, large tracts of arable land combined with a large pool of workers promote efficient production, which manifests the revealed comparative advantage (RCA) in labour-intensive commodities (Kea et al., 2020). The RCA index used to measure the relative competitiveness of agricultural exports suggests that Cambodia's rice export has become more competitive over time, which reflects the role played by its factor endowments (Kea et al., 2020). This observation is corroborated by previous studies which found that nations rich in agricultural resources perform better in those sectors that use these resources (Wesley et al., 2000). Moreover, the labour-intensive farming system in Cambodia aligns with its endowment of labour, creating a comparative advantage in specialising in agricultural exports over capital-intensive goods (Rumankova et al., 2020). Some researches show that comparative advantages in agricultural products are not merely dependent on economies of scale but also significantly influenced by the type of agricultural practices in place. In Cambodia, family-run farms dominate, which aligns closely with labour-intensive production, contribute to a stronger RCA compared to larger corporate farms that may focus on capital-intensive production methods (Rumankova et al., 2020). Moreover, industry analyses highlight those nations like Cambodia experience substantial gains from trade through capitalising on their comparative advantages; which corresponds with the Heckscher-Ohlin framework's predictions regarding trade patterns driven by factor endowments [81]. Wesley et al. (2000), confirm that the alignment of Cambodia's agricultural specialisations with the predictions of the Heckscher-Ohlin model is reinforced by the empirical evidence that link agricultural productivity and competitiveness with national factor endowments. As agriculture remains a critical element of Cambodia's economy the enhanced productive capacity in land-intensive sectors illustrates the interplay between resource availability and trade capabilities; confirming the theoretical premises established by the Heckscher-Ohlin model. This relationship underscores the ongoing importance of optimising factor utilisation within Cambodia's agricultural policies to leverage its advantages in global markets (Vollrath et al., 2009). Cambodia's agricultural speciality aligns closely with the Heckscher-Ohlin model, highlighting the significant role of its land and labour endowments in shaping its comparative advantage in agricultural commodities. The empirical studies support this theoretical framework; emphasising that it requires strategic investments in these sectors to maintain and enhance export competitiveness.

5.3 | Regional Benchmarking and Strategic Context

Cambodia's export basket also reflected a highly concentrated orientation towards certain agricultural products, reflecting its level of specialisation, which was in contrast to the overall global market for exports. Cambodia's overall exports account for a relatively small proportion of total world exports, but the most recent composition does point to areas in which Cambodia targets success, particularly agricultural goods such as rice and cashew nuts. For example, cashew nuts contribute to about 4.3% of Cambodia's exportation share. It reflects the strategic value for the Cambodian economy but is still a lesser relative contribution on a global scale (Fauziyah et al., 2017) and so represent a major aspect profiled describing pandemic implications on trade but are not one of the primary cash crops being considered. The striking specialisation ratios for Cambodia's exports reveal very large deviations with respect to average figures for the world. The relatively large share of cashew nuts in the export would portray Cambodia as holding its own unique place in the agricultural market, even though "as a global export commodity, Cambodia doesn't rank as a leader by any

standard" (Fauziyah et al., 2017). In addition, research has shown that Cambodia's rice sector has been growing in relative export competitiveness and emerging as a key part of the country's agricultural specialisation (Kea et al., 2020). This competitive evolution illustrates better-placed commodities in international markets, conditioning Cambodian export composition. Although, there is a significant level of competition in the international market for cashew nuts and rice from countries such as India and Vietnam, through targeted investments by Cambodia in these commodities, niche markets where higher revenue potentials can be expected could be developed (Fauziyah et al., 2017). On the other hand, continuing to have relationships with trading partners, such as China, indicates that there is potential for strengthening agricultural trade relations with countries through strategic partnerships and agreements to increase exports of these commodities (Tao et al., 2025). Therefore, the increasing requirement from international community for cashew nuts and Cambodia's relatively small production capacity also draw attention to issues of sustainability and scale in agriculture (Evans et al., 2015). That, in turn, triggers a call for an increased level of agro-industrialisation, where more value is added to those commodities to make them "innovative products" and raise their profile on the international stage (Koeun & Mardy, 2023). These approaches might include investment in processing plants and better farm practices, elements that constitute a small fraction of Cambodia's exportable agriculture production. Cambodia's export portfolio shows a deliberate path of specialisation in selected agricultural commodities, although its overall exports are still very small compared to global output. The structural emphasis on commodities such as cashew nuts and rice present opportunities and challenges. So, developing a culture of competition and agro-processing, Cambodia is well-positioned to do better in the global market. But it has to negotiate the complexities of international trade pressures and building domestic capacity.

The portrait of Cambodia in the context of agricultural competitiveness, particularly when contrasted with those of its ASEAN neighbouring countries, shows a canvas where regional dynamics have and continue to play a significant role in shaping the country's competitive advantages and future trajectory. Cambodia's only viable market is in the agricultural sector, but it faces strong competition from Vietnam and Laos. Because these two countries are found to dominate RCA, which results in a number of major agricultural crops – rice, cassava, and rubber – with substantial comparative advantages, and the country needs strategic intervention plans to develop the agricultural sector and compete in its regional market. Vietnam has made quite a strong investment in processing technology and effective cultivation, making its agricultural products more competitive in quality and affordable for the market. This investment has resulted in higher productivity varieties of commodity crops such as cassava, with the planted area in 2000 growing steadily from 237,600 ha to around 569,900 ha by 2016, compared to Cambodia, which expanded from 16,000 to a whopping 684,070 ha during the same period (Delaquis et al., 2018). These gaps in the production chain point to the importance of Cambodia developing increased production as well as quality processing to be able to effectively 'compete' with these neighbours [28]. In addition, the competitive structures of these countries reflect a desire to enter external global markets and not simply concentrate on regional trade. Therefore, Cambodia should examine export strategies to satisfy overseas requirements (Hoang, 2018). In rubber production, both Laos and Vietnam have created a large plantation area and an efficient export system, which are affected by the global demand shift to place them in a larger market trading connection (Ozdogan et al., 2018). Any advantages Cambodia may have at the outset in rubber production are compromised by a lack of technology and market access compared to its competitors, constituting another area that urgently needs adjustment. To enhance the performance of its rubber industry, Cambodia needs to mimic best practices found in competitors' dendritic-centric platforms with specific reference to value addition and market logistics (Prasada & Dhamira, 2021). Hoang's study in 2020 on the agricultural competitiveness of ASEAN nations points out that Cambodia is relatively less competitive compared to the other countries in the region. This focus necessitates investments in innovation and technology transfer that would enable the country to enhance agricultural productivity, thus narrowing its competitive benchmark more towards their peers from Vietnam and Laos. Moreover, Cambodia's involvement in regional cooperation on agriculture can also be a time of integration and development cooperation that benefits countries with learning-by-doing and the spread of best practices to further major strengths (Hoang, 2018; Ye et al., 2025). Through schemes such as agricultural policy formation, the application of advanced technology, and improved market access, farming in Cambodia can enhance its productivity and leverage our comparative advantages within ASEAN. Achieving this is possible, as demonstrated by the growing examples in our region, and it can ensure that Cambodia secures a more advantageous position in ASEAN agri-food trading by addressing its own technological or logistical challenges and benefiting from clear regional successes.

5.4 | Policy Implications and Limitations for Future Studies

Against the background of Cambodia's export-orientated economy, there is increasing evidence pointing to a significant degree of specialisation, which suggests a targeted approach to designing policies. Research has shown that cashew nuts, rubber, and rice have strong comparative advantages in global markets, and this reinforces the need for targeted investments in their value chains, market access, and infrastructure (Huo, 2014; Kea et al., 2020). This strategic attention is necessary as it corresponds to the broader objective of maintaining the competitiveness within these priority areas that are important for Cambodia's economic expansion (Tao et al., 2025). Policymakers should adopt a more comprehensive approach which is not only aimed at strengthening identified sectors but also incorporates wider economic determinants of competitiveness (Kozelsky et al., 2024). For example, the use of monetary policy instruments can have important effects on agricultural production and export performance when it is used to regulate the interest rates and minimise farmers' borrowing costs. This might in turn contribute to the growth and competitiveness of Cambodian agriculture (Tao et al., 2025). Second, collaboration with foreign partners, such as China, is essential to understanding the external competitive pressures that may influence the strategic focus on these strong competitive advantage sectors. The analysis of revealed comparative advantage (RCA) offers a thrush holds, as to which industries do require such focused strategic attention and investment in the future. The evidence suggests that the Cambodian rice industry has enhanced its global competitiveness over time, demonstrating an improvement in its relative export status (Kea et al., 2020). These kinds of insights are important for policy makers; trying to think about where to effectively put limited resources. Through tools such as RCA, policymakers pinpoint promising locations in current sectors, providing useful information that can be used to guide policy changes for achieving the greatest export value (Huo, 2014; Kea et al., 2020). Developing infrastructure is a key aspect of this discussion; where studies have shown that even competitive agricultural sectors might fail to reach wider markets in the absence of sound transport and logistics arrangements (Kozelsky et al., 2014). Pointed investment here would both assist with entering global markets and drive efficiencies in local supply chains. The agricultural export industries of Cambodia are poised to make a meaningful contribution to national development. Through aligning agricultural policies with competitive advantage, investing in infrastructure and encouraging international cooperation, Cambodia can maintain and improve its competitiveness in the area of agricultural exports. Data driven approach using RCA and sector-based analysis will help policymakers in better decision making towards the investments in future.

The current paper makes a great contribution to the literature by addressing an important research gap on Cambodia's agro-product export, as there is a lack of prior related studies or quantitative-based studies with committed analysis tools, such as RCA. Such a method enables a detailed comparison and examination of the competitive performance of Cambodia's main agricultural exports, namely, rice, cashews, cassava, bananas, and rubber. The paper is an important contribution to research on these crops; advancing our knowledge of their roles and significance in agricultural systems in Cambodia. Existing literature has concentrated on single or narrow comparisons; therefore, the present multiple-product comparative analysis contributes to the scholarship of agricultural export in developing countries such as Cambodia. Earlier studies examined Revealed Export Competitiveness (REC) of rice and reported an increase in competitiveness due to sound policy measures (Kea et al., 2020). However, this study successfully covers a wider range of large exports, unlike earlier studies. The use of the RCA model is important, as it systematically analyses and compares competitive positions of exports in respect to global markets. By studying rice combined with other major exports, this research places the competitiveness of Cambodian exports in a more holistic view that previous ones have tended to ignore. Every item that operates in different market dynamics and competitive environments shape the general face of agriculture. This concurrent examination offers a richer solution to how changes in policy or market environment influence competitiveness at various levels of the agricultural sector (Kea et al., 2020; Hing, 2023). Additionally, the significance of agricultural exports in Cambodia's economy, where these sectors are a source of livelihood for a large number of people, also grows the importance of this paper. A significant proportion of the Cambodian labour force is employed in agriculture; so, an understanding of export competitiveness in these commodities is necessary for sound policy development and economic growth (Chhinh & Millington, 2015). Therefore, the results of this study could be used as decision-making inputs for policymakers to refine and improve their farm efforts and route towards a good-trade mechanism. Especially after the pandemic in which each country will do an export-review strategy (Hing, 2023). This research will not only contribute to our knowledge about agricultural exports in Cambodia but also facilitate a more profound understanding of the impact of external

competitive pressures on export sectors in LDCs more generally. Incorporating the method into the study of RCA adds an additional layer to the economic analysis of agricultural exports and serves as a reference for implementing research on comparative advantage in non-RCA literature.

We acknowledge that the Revealed Comparative Advantage (RCA) index has methodological shortcomings, particularly its static nature, as it represents competitive levels at a single point in time. This feature can be a source of serious reduction of richness in the analysis of trade flows, as it does not take into account changing market conditions and changing comparative advantages (Ferto & Hubbard, 2023; Akram et al., 2024; Hoen & Oosterhaven, 2006). In contrast, the trade-sensitive nature of the RCA index also presents an obstacle to low-income countries given that significant differences in import and export flows can skew foreign competitiveness (Kuzmenko et al., 2022; Mizik & Balogh, 2022). Distortions of this type occur when a high RCA value can be seen as a “strong comparative advantage. But if trade volumes are extremely unbalanced, the RCA could present a distorted view of a country’s export potential (Wosiek & Visvizi, 2021). The problem of data aggregation is still a major issue for the use of the RCA index. Such aggregation may hide sub-national heterogeneity and differences in sector-specific dynamics, which could be important for comparative advantage (Tampubolon, 2019; Leromain & Orefine, 2014). Various modifications and adaptations of the RCA index have been developed to address these problems. These modified statistics may provide alternative measurements that, however, are not fully analysed in terms of dynamics and thus frequently require complementary methods for temporal shifts and perturbations (Guo et al., 2019; Ahmad et al., 2017). To mitigate these drawbacks, future research may be focused on whole dynamical analyses that would bring the RCA index into conjunction with other analytical frameworks to accomplish a better nuanced perspective of comparative advantage. Using composite RCA with other econometric indicators would provide a wider aspect of trade competitiveness and make it possible to investigate the dynamic change, which static RCA cannot detect (Shuai & Xi, 2011; Shen & Gu, 2007). Embracing a holistic approach, such as the innovative indices based on VWRCA suggested by Wosiek and Visvizi (2021), researchers might strengthen the trade competitiveness assessments to an extent. Ultimately, it would take such cross-disciplinary approaches to deliver policy-relevant insights not possible with traditional trade research.

6 | CONCLUSION

This paper examines the agricultural export competitiveness of Cambodia using the Revealed Comparative Advantage (RCA) index for five main agricultural products in 2015: rice, cashew nuts, cassava, bananas, and rubber. The study usefully addresses a major limitation in the extant literature that has too often been limited to single commodity analyses by presenting an extensive, multi-product quantitative evaluation. Results indicate that Cambodia has a strong and unique comparative advantage in the five sectors studied. Analysis indicates an extraordinarily high RCA for cashew nuts (RCA: 143.1) and substantial advantages in rubber (RCA: 33.5) and rice (11.2). These findings place China not only as a player but also as a frontrunner in the global marketplace of these goods. In addition, bananas and cassava also have large but less strong comparative advantages, corroborating a specialised, concentrated, but thus narrow agricultural export profile. This empirical evidence offers firm support for the classical trade theories, as it shows that Cambodia’s export pattern is in harmony with its relative scarcity factor—the abundance of land and labour proposed by the HO model. The unveiled competitiveness is thus empirical proof of the nation’s efficiency in these particular agricultural value chains. From a policy perspective, these findings define an objective steer for strategic choices. The finding indicates that focusing investments in the value chains of these highly performing sectors – especially cashew nuts, rubber and rice – is likely to unlock its economic growth potential, generate export revenue and uplift livelihoods in rural areas. Of the existing aliquots, policymakers are advised to pay careful attention to enhancing infrastructure, increasing value-added processing and market penetration in order to capitalise on its areas of established comparative advantage. While Cambodia has significant challenges in attracting business from its ASEAN neighbours, a focused strategy can help it consolidate and expand the gains achieved so far by developing a competitive position that leverages existing natural resource endowments. This paper, in conclusion, establishes Cambodia’s strong overall competitive position in major agricultural exports and provides necessary analytical grounding for policy development. By making strategic investments in and fostering these already strong areas, Cambodia can deepen its economic resilience and keep its agricultural engine driving sustainable national development forward.

Conflict of Interest

The authors declare that there are no conflicts of interest regarding the publication of this manuscript.

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Author Contributions

All authors contributed substantially to the conception and design of the study, data collection, data analysis, and manuscript preparation. All authors reviewed and approved the final version of the manuscript.

Informed Consent

Informed consent was obtained from all participants involved in the study.

Use of Generative AI

The authors confirm that generative AI tools were used solely for minor language refinement purposes and did not contribute to the intellectual content, analysis, interpretation, or conclusions of the study.

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