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AN ANALYSIS OF THE COMPARATIVE ADVANTAGE OF VIETNAM'S AGRI-PRODUCT EXPORTS TO EU

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This paper aims to assess the comparative advantage of Vietnam's exported agricultural products to the EU market and analyze the stability and trend of comparative advantage in the period 2003-2018. The results show that: (i) Vietnam has comparative advantage and specialization in the agri-product exports with HS codes in tax systems, which includes: Coffee, tea, mate and spices (HS09); Edible fruit and nuts; peel of citrus fruit or melons (HS08); Fish and meat products (HS03, HS16); (ii) Agricultural products with comparative advantage but without specialization for exporting are Products of the milling industry; malt; starches; inulin; wheat gluten (HS11); Preparations of cereals, flour, starch or milk; pastrycooks' products (HS19); Miscellaneous edible preparations (HS21); (iii) Specialized agricultural products for export without comparative advantage are mainly vegetables and products from vegetables, fruits, seeds and grains; (iv) Agricultural products without comparative advantage or specialization in exporting are mainly processed foods. Moreover, Vietnam's agricultural products exported to the EU have the comparative advantage convergence pattern over the period, and those with weak comparative advantage increases in the beginning while those with strong comparative advantage decreases at first. From the results of quantitative analysis, the study has policy implications to promote the comparative advantage and the export strategies for each group of Vietnam's agricultural products.

Keywords: *comparative advantage, agricultural products, export, Vietnam.*

1. Introduction

The theory of comparative advantage is one of David Ricardo's oldest theories of international trade (1772-1823), which clarifies: the driving force behind international trade is not an absolute advantage but comparative advantage. Even if a country has an absolute advantage in all goods (that is, it can produce all goods more efficiently than others), it can still benefit from international trade through enhancing specialization in goods with comparative advantage. The economist Paul Samuelson, who was awarded the 1970 Nobel Prize in economics, wrote that: Despite its limitations, the theory of comparative advantage remains one of the most profound truths of all branches of economics. Countries that do not care about comparative advantage will pay a very high price for their standard of living and economic growth.

Currently, Vietnam is still an agricultural country with nearly 40% of the workforce working in this sector. In 2018, Vietnam's agriculture, forestry, and fishery sector grew 3.76%, contributing 8.7% to the overall growth. Additionally, Vietnam's agricultural products have met the demand for domestic con-

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sumption and have been ranked 15th in the list of top agri-product exporting countries with the export turnover reaching 40.02 billion USD.

The European Union (EU) is one of the major trading partners of Vietnam. In 2018, Vietnam ranked 13th (2.1 percent) in the EU's agri-commodities import markets, corresponding to 2494 million euros (according to statistics from Eurostat). The Vietnam - EU free trade agreement officially approved by the European Parliament in early 2020 expectantly takes the number of opportunities for Vietnam's agricultural products exported to the EU - a difficult but potential market. To take advantage of this chance, Vietnam needs to identify the comparative advantage of agricultural exports and raises agri-export turnover, thereby building appropriate export plans and strategies.

The main aims of this study are to investigate the comparative advantage of Vietnamese agricultural products exported to the EU through several indicators and to analyze the stability and trend of these indicators over the period 2003-2018. Research results are the basis for managers and policymakers in monitoring export performance and supporting decision-making in agricultural value chain design, development policy, and export strategy for each agri-export commodities with comparative advantage and export specialization to different degrees.

2. Overview

2.1. Measure of Comparative Advantage

The concept of Comparative Advantage is first known in Ricardo's work "Principles of Political Economy and Taxation" (1817), which indicates the possibility that a country can produce one certain goods at a lower cost than other countries. The law of comparative advantage that Ricardo drew is: each country should export the products with comparative advantage and also import those without comparative advantage. This law has inspired many researchers to develop indicators measuring comparative advantage over products or industries in the country or region exported to a target market.

Revealed comparative advantage (RCA)

Revealed comparative advantage was first introduced by Liesner (1958) and was developed by Balassa to measure comparative advantage (Balassa, 1965).

Revealed comparative advantage (RCA) is defined as the ratio of one good's export turnover of a country to its share of the world's total export turnover (or another country's total):

$$RCA_{ij} = \left(X_{ij} / X_i \right) / \left(X_{wj} / X_w \right)$$

Where, RCA_{ij} is the index of revealed comparative advantage of country i in export product j (to market Y);

X_{ij} is the export value of product j of country i (to market Y);

X_i is the total export value of country i (to market Y);

X_{wj} is the export value of product j of the world (to market Y);

X_w is the total export value of the world (to market Y).

The value of the RCA changes in the interval (0, + ∞). The RCA close to 0 indicates that the country has no exports in that industry. If $RCA_{ij}>1$, country i's share of exports for product j is greater than the share of that product's exports in the world exports, and country i also has a comparative advantage in product j. The larger this index is, the stronger comparative advantage is. If $RCA_{ij}<1$, country i has no comparative advantage in exporting product j.

The index of revealed comparative advantage (RCA) has been widely used in empirical studies, although there are many criticisms, for instance, (i) it serves as an index of export specialization; (ii) it is static and does not exhibit the dynamics of comparative advantage over time; (iii) it does not include the importing party; (iv) the distribution of the index is asymmetric and non-standard distribution; (v) it takes a value from 0 to ∞, so it is difficult to explain and compare; (vi) an indicator shows export success in the market, however, it

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may demonstrate competitiveness rather than comparative advantage (Vollrath, 1991; Proudman & Redding, 2000; Benedictis & Tamberi, 2004; Ferto, 2003).

To solve the limitations of the RCA index, the researchers have built some additional indicators to measure comparative advantage according to different criteria.

The revealed symmetric comparative advantage (RSCA) is determined as follows:

RSCA=(RCA-1)/(RCA+1)

The value of the RSCA is in the interval [-1; 1] and avoids the problem of zero value taking the logarithm (an arbitrary constant is not added to the RCA). The index has the economic advantage when attributing changes below uniformity with the same weight to changes above uniformity, furthermore, it is the best option discussed with standard calculation.

Revealed trade advantage (RTA)

Besides the revealed comparative advantage (RCA) index, we can use the index of revealed import advantage (RMA) and evaluate revealed trade advantage (RTA) (Ferto and Hubbard, 2003).

$$RMA_{ij} = \left(M_{ij}/M_i\right) / \left(M_{wj}/M_w\right)$$

$$RTA_{ij} = RCA_{ij} - RMA_{ij} = \left(X_{ij}/X_i\right) / \left(X_{wj}/X_w\right) - \left(M_{ij}/M_i\right) / \left(M_{wj}/M_w\right)$$

In which: X,M are export and import; i,j,w in country order; industry (product category) and the world (to market Y).

The value of RTA_{ij} is between -∞ and + ∞; $RTA_{ij}>0$ represents a good with comparative export advantage; $RTA_{ij}<0$ indicates a good has a lower export advantage over an import comparative advantage; In practice, trade patterns can be distorted by policies and interventions, which are especially true of the agricultural sector, the degree of import restrictions, export subsidies and policies, and other guards possibly falsifying the index of comparative advantage (Viet Van Hoang et al, 2017). Therefore, an additional indicator measuring the degree of product export specialization can be considered.

Net Export Index (NEI)

The net export index (NEI) is a common formula calculated by exports minus imports divided by total trade value by country and by category. This index examines the role of imports and exports in the balance of trade and assesses comparative advantage in a commodity (Banterle & Carraresi, 2007).

$$NEI_{ij} = \frac{X_{ij} - M_{ij}}{X_{ij} + M_{ij}}$$

The value of *NEI* is between -1 (when a country imports only product j) and 1 (when a country exports only product j), in case exports equals imports NEI is 0. If $NEI > 0$, country i has a net export of good j, or the net export of good j of country i is higher than the world average and therefore has a comparative advantage; on the other hand, if NEI < 0, the productivity of country i is lower than the world average and shows a comparative disadvantage.

Studies also use some other indicators to evaluate comparative advantage and export competitiveness such as the Lafay index (LFI); intra-industry trade index; normalized revealed comparative advantage index (NRCA). In this study, the author approaches four indicators RCA, RSCA, RTA, NEI to measure comparative advantage, and the ability to specialize in agri-export with the two-digit HS codes and exported to the EU market.

2.2. Analysis of Stability of the Indicators Over Time

According to Ferto (2003); Birol Erkan & Kazım Sarıcoban (2014) stability of the indicators is analyzed using the ordinary least squares method (OLS) based on the Galton regression model presented by Hart & Prais (1956) and first used by Cantwell (1989).

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The linear regression model estimating the stability of the Goodwill indices in this study is determined as follows:

$CA_{jt} = \alpha_j + \beta_j CA_{(j,t-1)} + \varepsilon_{ij}$ (1)

Where, CA is an index of comparative advantage studied including: RCA, RSCA, RTA, NEI; j is the product category studied, t indicates time in year;

α is constant, β is the regression coefficient, and ε_jt is the remainder with zero mean, constant variance, and normal distribution.

Explanation of the regression results as follows:

If β = 1, it corresponds to the comparative advantage of the product group that does not change over time (from year to year). If β > 1, showing that: the country tends to have more advantage over product groups with strong comparative advantage and less advantage in groups of products with weak comparative advantage. If 0 < β <1, industries with weak comparative advantage initially increase over time, while industries with strong comparative advantage decrease initially. If β = 0, then there is no relationship between comparative advantage over time. If β < 0, the relationship of comparative advantage of product categories is reversed, and the indicators at first below the average will rise higher than the average next year and vice versa.

2.3. Trend Analysis of the Indicators

In case the comparative advantage indices tend to distinctly follow the law over time, we can use the trend function to show the underlying trend of the phenomenon. Trend function method can be undertaken within a regression analysis expressed the fluctuation trend of the phenomenon over time and then estimate the parameters by the least-squares analysis. This model identifies trends in comparative advantage, loss, or maintenance over time.

The linear trend function has the following form:

$CA_{jt} = \alpha_j + \beta_{jt} + \varepsilon_{jt}$ (2)

Where, CA is an index of comparative advantage studied, including RCA, RSCA, RTA, NEI;

α_j is a constant; β_j is a regression coefficient showing the trend of comparative advantage; t is time index; and ε_{jt} is the remainder.

The interpretation of regression results is as follows:

If β_j>0 then product j tends to gain comparative advantage over time;

If β_j<0 then product j tends to lose its comparative advantage over time;

If β_j is close to 0 then the comparative advantage of product j is stable over time.

3. Data and Research Method

Data scope

The EU definition of agricultural commodities is consistent with the WTO definition in Appendix 1 to the Agreement on Agriculture, including (1) Basic agricultural products such as rice, flour, milk, living animals, coffee, pepper, cashew, tea, fresh fruits, and vegetables, etc. (2) Derivative products such as bread, butter, cooking oil, meat... (3) Processed products such as confectionery, dairy products, sausages, alcohol, cigarettes, cotton fibers, raw animal skins, etc. Accordingly, agri-products have a broad scope in the harmonized system with codes from HS01 to HS24 but excluding fishing and forestry.

This research approach is the analysis of agri-products with 24 codes from HS01 to HS24 in the harmonized system in 2017.

Data sources

The study uses import and export data of Vietnam and the EU for the year 2003-2018, from UN Comtrade Database. https://comtrade.un.org/data

In the article, the indexes of comparative advantage calculated are:

- Export index of revealed comparative advantage (RCA)
- Export index of revealed symmetric comparative advantage (RSCA)
- Revealed trade advantage (RTA)
- Net export index (NEI)

Those indexes are estimated through each year and then listed by the average of each product with codes from HS01 to HS24, during the period 2003-2018, and the other periods 2003-2007; 2008-2012; and 2013-2018, thus ranked the comparative advantage and export specialization of each product.

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The study using the OLS method to estimate linear regression models aims to consider the stability and the trend of comparative advantage in 2003-2018.

In the quantitative analysis, the author uses Excel and STATA.

4. Experimental Research Results

4.1. Comparative Advantage Index

Table 1: *Comparative advantage of Vietnam's agricultural products exported to the EU, 2018*

HS code	Product descriptions	RCA	RSCA	RTA	NEI
01	Live animals	2.18	0.37	1.49	-0.05
02	Meat and edible meat offal	0.09	-0.84	-4.35	-0.95
03	Fish and crustaceans, molluscs and other aquatic invertebrates	2.61	0.45	-4.23	0.73
04	Dairy produce; birds' eggs; natural honey; edible products of animal origin, not elsewhere specified or included	0.19	-0.68	-2.39	-0.95
05	Products of animal origin, not elsewhere specified or included	0.75	-0.14	-10.76	-0.58
06	Live trees and other plants; bulbs, roots and the like; cut flowers and ornamental foliage	0.21	-0.65	-4.15	-0.78
07	Edible vegetables and certain roots and tubers	0.17	-0.72	-0.11	0.53
08	Edible fruit and nuts; peel of citrus fruit or melons	2.78	0.47	1.90	0.97
09	Coffee, tea, mate and spices	9.99	0.82	9.56	0.99
10	Cereals	0.15	-0.74	-0.46	-0.03
11	Products of the milling industry; malt; starches; inulin; wheat gluten	1.97	0.33	-5.83	-0.87
12	Oil seeds and oleaginous fruits; miscellaneous grains, seeds and fruit; industrial or medicinal plants ; straw and fodder	0.07	-0.87	-1.50	-0.35
13	Lac; gums, resins and other vegetable saps and extracts	0.30	-0.53	-1.94	-0.46
14	Vegetable plaiting materials; vegetable products not elsewhere specified or included	0.32	-0.51	-0.63	0.87
15	Animal or vegetable fats and oils and their cleavage products; prepared edible fats; animal or vegetable waxes	0.09	-0.84	-0.35	0.10
16	Preparations of meat, of fish or of crustaceans, molluscs or other aquatic invertebrates	4.87	0.66	4.13	0.97
17	Sugars and sugar confectionery	0.24	-0.62	-0.73	-0.41
18	Cocoa and cocoa preparations	0.05	-0.91	-0.43	-0.39
19	Preparations of cereals, flour, starch or milk; pastrycooks' products	3.35	0.54	1.85	0.07
20	Preparations of vegetables, fruit, nuts or other parts of plants	0.50	-0.34	-0.16	0.43
21	Miscellaneous edible preparations	1.11	0.05	-0.83	-0.14
22	Beverages, spirits and vinegar	0.11	-0.80	-1.26	-0.89
23	Residues and waste from the food industries; prepared animal fodder	0.07	-0.86	-5.78	-0.85
24	Tobacco and manufactured tobacco substitutes	0.01	-0.98	-0.64	-0.94

Source: Authors' estimations from Comtrade data

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Comparative advantage of agricultural products with code HS01 - HS24 in 2018

The indexes measuring the comparative advantage of agri-products with code HS01 to HS24 in 2018 are presented in Table 1.

In 2018, Vietnam's agricultural products exported to the EU that had the leading comparative advantage was Coffee, tea, mate and spices (HS09), shown in the positive and highest four indexes, followed by HS16, and the third-ranking is products from Preparations of cereals, flour, starch or milk; pastrycooks' products (HS19). Some agricultural commodities also have export advantages such as product groups HS01 (Live animals), HS03 (Fish and crustaceans, molluscs and other aquatic invertebrates), HS08 (Edible fruit and nuts; peel of citrus fruit or melons).

In general, the remaining agricultural products did not have a comparative advantage when exported to the EU and many agricultural products tended to be imported from this market. In 2018, Vietnam imported agricultural products with low export advantages from the EU, such as Tobacco and manufactured tobacco substitutes (HS24); Beverages, spirits and vinegar (HS22); Meat and edible meat offal (HS2); Dairy produce; birds' eggs; natural honey; edible products of animal origin, not elsewhere specified or included (HS04), shown by low RCA and NEI close to -1.

Comparative advantage in the agricultural products with codes HS01 - HS24 over the periods

To further assess the comparative advantage in Vietnamese agricultural products exported to the EU, the study continues to calculate the average of the index of comparative advantage over the periods 2003-2007; 2008-2012; 2013-2018, and 2003-2018 (see table 2).

The group with high export advantage with RCA > 1, RSCA > 0, RTA > 0, NEI > 0 in all periods. Coffee, tea, mate and spices (HS09) is ranked first, followed by the products with code HS16 and HS08. During the period 2008-2012, those three categories were on the top three products. During the two periods of 2003-2007 and 2013-2018, the comparative advantage in these three agricultural groups decreased.

The agricultural products that did not have an export advantage and imported mainly from the EU in the 2003-2018 period were quite similar to the analysis of the year 2018, including Dairy produce; birds' eggs; natural honey; edible products of animal origin, not elsewhere specified or included (HS04); Beverages, spirits and vinegar (HS22); Tobacco and manufactured tobacco substitutes (HS24). This also expresses a part of the perception: Vietnam and the EU are not likely to be competitive trade relations over the periods from this study but complementary that is beneficial to both sides. Vietnam mainly exports agricultural products with a high comparative advantage to the EU and imports products with no comparative advantage to supplement the needs of the domestic market.

Classification of export agricultural products according to comparative advantage and export specialization

According to the significance of comparative advantage indices, this study classifies agricultural products into A, B, C, D with the following criteria: (i) having comparative advantage with RCA > 1 or RSCA > 0; and (ii) having export specialization with net exports NEI > 0.

From the results of comparative advantage estimation (Table 2) and classification criteria of agricultural products (table 3), agricultural products with codes from HS01 to HS24 are categorized into groups A, B, C, D over each period. The classification results in Table 4 show:

- Group A: Vietnamese agricultural commodities exported to the EU have comparative advantage and export specialization in all research periods, including HS09 (Coffee, tea, mate and spices); HS16 (Preparations of meat, of fish or of crustaceans, molluscs or other aquatic invertebrates); HS08 (Edible fruit and nuts; peel of citrus fruit or melons); HS01 (Live animals); HS03 (Fish and crustaceans, mollusks and other aquatic invertebrates).

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Table 2: *Average values of the indicators of comparative advantage of agricultural exports from Vietnam to the EU by period*

	Period 2003-2007				Period 2008-2012				Period 2013-2018				Period 2003-2018			
HS	*RCA*	*RSCA*	*RTA*	*NEI*	*RCA*	*RSCA*	*RTA*	*NEI*	*RCA*	*RSCA*	*RTA*	*NEI*	*RCA*	*RSCA*	*RTA*	*NEI*
1	2.70	0.42	1.81	0.57	4.28	0.60	3.68	0.48	2.00	0.30	1.10	-0.10	2.93	0.43	2.13	0.29
2	0.12	-0.78	-0.70	0.15	0.15	-0.74	-4.17	-0.88	0.09	-0.84	-2.80	-0.89	0.12	-0.79	-2.57	-0.56
3	8.38	0.72	5.10	0.95	14.98	0.86	1.46	0.84	3.49	0.51	-12.46	0.58	8.61	0.68	-2.62	0.78
4	0.92	-0.17	-4.99	-0.86	0.01	-0.97	-5.09	-1.00	0.16	-0.72	-2.91	-0.96	0.35	-0.63	-4.24	-0.94
5	0.32	-0.53	-5.56	-0.56	0.51	-0.33	-11.64	-0.70	0.47	-0.37	-11.84	-0.68	0.44	-0.41	-9.82	-0.65
6	0.14	-0.75	-0.83	-0.48	0.43	-0.40	-2.56	-0.54	0.20	-0.67	-4.46	-0.79	0.25	-0.61	-2.73	-0.62
7	0.68	-0.19	0.56	0.93	0.70	-0.18	0.58	0.90	0.25	-0.61	0.07	0.72	0.53	-0.35	0.38	0.84
8	2.65	0.43	2.52	0.99	4.45	0.62	4.27	0.99	2.47	0.42	2.03	0.98	3.14	0.49	2.88	0.99
9	34.16	0.94	33.95	1.00	32.59	0.94	31.90	1.00	12.69	0.84	11.97	0.99	25.62	0.90	25.07	1.00
10	0.79	-0.17	0.59	0.76	1.39	0.07	0.25	0.37	0.34	-0.54	-1.73	-0.22	0.81	-0.23	-0.39	0.27
11	2.23	0.33	-5.36	-0.93	3.46	0.55	-11.05	-0.94	1.73	0.26	-11.04	-0.92	2.43	0.37	-9.27	-0.93
12	0.06	-0.89	-2.37	-0.55	0.10	-0.81	-3.61	-0.39	0.06	-0.89	-1.50	-0.37	0.07	-0.87	-2.43	-0.43
13	0.14	-0.76	-2.12	-0.80	0.09	-0.85	-5.88	-0.93	0.10	-0.84	-3.15	-0.82	0.11	-0.82	-3.68	-0.85
14	2.73	0.45	2.53	0.98	0.99	-0.15	0.89	0.98	0.42	-0.41	0.09	0.96	1.32	-0.06	1.10	0.98
15	0.02	-0.97	-0.33	-0.71	0.03	-0.94	-0.48	-0.58	0.04	-0.93	-0.48	-0.39	0.03	-0.94	-0.43	-0.55
16	4.94	0.63	4.23	0.96	6.55	0.73	5.48	0.96	4.56	0.63	3.62	0.97	5.30	0.66	4.39	0.96
17	0.14	-0.76	-1.47	-0.67	0.37	-0.48	-1.46	-0.36	0.27	-0.60	-1.19	-0.26	0.26	-0.61	-1.36	-0.42
18	0.02	-0.96	-0.38	-0.72	0.05	-0.91	-0.59	-0.67	0.06	-0.89	-0.45	-0.32	0.04	-0.92	-0.47	-0.55
19	9.72	0.80	4.74	-0.08	10.70	0.82	4.94	-0.13	3.80	0.57	1.04	-0.13	7.80	0.72	3.41	-0.11
20	0.91	-0.06	0.61	0.81	1.24	0.06	0.78	0.73	0.47	-0.36	-0.09	0.54	0.85	-0.14	0.40	0.68
21	1.00	-0.03	-5.13	-0.77	1.08	-0.02	-5.89	-0.75	1.43	0.13	-1.37	-0.19	1.19	0.03	-3.96	-0.55
22	0.05	-0.91	-0.59	-0.91	0.16	-0.74	-1.56	-0.89	0.07	-0.86	-1.19	-0.92	0.09	-0.84	-1.12	-0.91
23	0.02	-0.96	-4.20	-0.83	0.09	-0.84	-9.47	-0.89	0.09	-0.84	-10.13	-0.87	0.07	-0.88	-8.07	-0.86
24	0.22	-0.65	-0.34	-0.28	0.30	-0.55	-0.57	-0.42	0.04	-0.93	-0.81	-0.88	0.17	-0.72	-0.59	-0.55

Source: The Authors's calculations from Comtrade data

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- Group B: Vietnamese agricultural commodities exported to the EU that have comparative advantage but are not specialized in export contain HS11 (Products of the milling industry; malt; starches; inulin; wheat gluten); HS19 (Preparations of cereals, flour, starch or milk; pastrycooks' products); HS21 (Miscellaneous edible preparations).

- Group C: Vietnamese agricultural products exported to the EU are specialized in export but have no comparative advantage, including HS07 (Edible vegetables and certain roots and tubers); HS10 (Cereals); HS14 (Vegetable plaiting materials; vegetable products not elsewhere specified or included); HS20 (Preparations of vegetables, fruit, nuts or other parts of plants). This result is consistent with the fact that the agri-products vegetables, tubers, and processed products from vegetables or cereals have an abundant supply in the domestic

Table 3: *Criteria for classifying comparative advantage*

Category	Explanation	RSCA	NEI
A	Has comparative advantage and export specialization	+	+
B	Has comparative advantage but no export specialization	+	-
C	Specializes in export but has no comparative advantage	-	+
D	There is no comparative advantage or export specialization	-	-

Source: The author's research results

Table 4: *Classification of agricultural products by comparative advantage in each period*

	2003-2007			2008-2012			2013-2018			2003-2018		
HS	RSCA	NEI	group	RSCA	NEI	group	RSCA	NEI	group	RSCA	NEI	group
01	+	+	A	+	+	A	+	+	A	+	+	A
02	-	+	C	-	-	D	-	-	D	-	-	D
03	+	+	A	+	+	A	+	+	A	+	+	A
04	-	-	D	-	-	D	-	-	D	-	-	D
05	-	-	D	-	-	D	-	-	D	-	-	D
06	-	-	D	-	-	D	-	-	D	-	-	D
07	-	+	C	-	+	C	-	+	C	-	+	C
08	+	+	A	+	+	A	+	+	A	+	+	A
09	+	+	A	+	+	A	+	+	A	+	+	A
10	-	+	C	+	+	A	-	-	D	-	+	C
11	+	-	B	+	-	B	+	-	B	+	-	B
12	-	-	D	-	-	D	-	-	D	-	-	D
13	-	-	D	-	-	D	-	-	D	-	-	D
14	+	+	A	-	+	C	-	+	C	-	+	C
15	-	-	D	-	-	D	-	-	D	-	-	D
16	+	+	A	+	+	A	+	+	A	+	+	A
17	-	-	D	-	-	D	-	-	D	-	-	D
18	-	-	D	-	-	D	-	-	D	-	-	D
19	+	-	B	+	-	B	+	-	B	+	-	B
20	-	+	C	+	+	A	-	+	C	-	+	C
21	-	-	D	-	-	D	+	-	B	+	-	B
22	-	-	D	-	-	D	-	-	D	-	-	D
23	-	-	D	-	-	D	-	-	D	-	-	D
24	-	-	D	-	-	D	-	-	D	-	-	D

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market; however, when approaching the EU market, there will be several disadvantages, for example, distance, consumption culture of these agricultural products, high requirements on quality standards and origin of goods in the EU market as well.

- Group D: Vietnamese agricultural products exported to the EU that do not have comparative advantage or export specialization are concentrated in the group of foods and processed foods from fruits and seeds with code HS02; HS04; HS05; HS06; HS12; HS13; HS15; HS17; HS18; HS22; HS23; HS24.

4.2. Research Results of the Stability of Comparative Advantage Over the Period 2003-2018

Model (1) $CA_{jt} = \alpha_j + \beta_j CA_{(j,t-1)} + \varepsilon_{jt}$ is estimated using the least-squares method (OLS). The estimation results of the coefficient β and the probability value (P-value) in the hypothesis test β = 0 for each index of comparative advantage and by agri-products with codes from HS01 to HS24 in the period 2003-2018 are given in Table 5. This result indicates that:

Table 5: *Estimation results of the coefficient β in the regression model assessing the stability of the index of comparative advantage, 2003-2018*

Chỉ số	RCA		RSCA		RTA		NEI	
HS	β	P-value	β	P-value	β	P-value	β	P-value
HS1	0.686	0.003	0.642	0.006	0.686	0.004	0.824	0.000
HS2	0.625	0.015	0.645	0.011	0.633	0.008	0.742	0.000
HS3	0.862	0.000	0.864	0.000	0.879	0.000	0.887	0.000
HS4	0.543	0.032	0.769	0.000	0.143	0.614	0.484	0.043
HS5	0.233	0.444	0.207	0.462	0.358	0.146	0.379	0.130
HS6	0.823	0.000	0.819	0.000	0.839	0.000	0.599	0.001
HS7	0.947	0.000	0.996	0.000	0.893	0.000	0.929	0.001
HS8	0.621	0.008	0.595	0.005	0.671	0.005	0.617	0.048
HS9	0.910	0.000	0.968	0.000	0.910	0.000	0.835	0.000
HS10	0.500	0.065	0.722	0.005	0.107	0.702	0.586	0.018
HS11	0.620	0.009	0.579	0.013	0.689	0.004	0.502	0.075
HS12	0.714	0.003	0.706	0.003	0.161	0.567	0.626	0.008
HS13	-0.012	0.971	0.019	0.952	0.402	0.123	0.569	0.080
HS14	0.855	0.000	0.896	0.000	0.882	0.000	0.678	0.109
HS15	0.499	0.160	0.496	0.156	0.562	0.017	0.540	0.090
HS16	0.508	0.024	0.437	0.021	0.500	0.031	0.227	0.375
HS17	0.278	0.306	0.347	0.193	0.393	0.155	0.582	0.019
HS18	0.247	0.375	0.258	0.353	0.489	0.041	0.388	0.141
HS19	0.894	0.000	0.991	0.000	0.773	0.001	0.343	0.268
HS20	0.778	0.001	0.800	0.001	0.807	0.001	0.799	0.002
HS21	0.485	0.067	0.575	0.025	0.917	0.000	0.984	0.000
HS22	0.462	0.074	0.481	0.060	0.703	0.001	0.317	0.252
HS23	0.715	0.003	0.733	0.002	0.663	0.003	0.397	0.014
HS24	0.819	0.001	0.876	0.000	0.632	0.005	0.730	0.000

Source: Author's estimation results from Comtrade data

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The agricultural products are not stable in both export advantage and export specialization (coefficient β is not statistically significant, corresponding to P-value > 0.1 for all four indicators RCA, RSCA, RTA, NEI) in several products with HS codes 05, 13, 16, 17, 18.

Agricultural products have stability in both export advantage and export specialization (coefficient β is statistically significant, corresponding to P-value ≤ 0.1 for all four indicators RCA, RSCA, RTA, NEI) in some products with HS codes 01, 02, 03, 06, 07, 08, 09, 11, 20, 21, 23, 24.

Agricultural products having stability in export advantage but not in export specialization are those with HS code 14, 16, 19.

The agricultural products having no stability in export advantage but stability in export specialization are those with HS code 13, 15, 17.

(Explanation: β is the regression coefficient in the model $CA_{jt} = \alpha_j + \beta_j \ CA_{(j,t-1)} + \varepsilon_{jt}$ where CA is the index of comparative advantage including RCA, RSCA, RTA, NEI in the period 2003-2018).

The estimated coefficients β (with P-value ≤ 0.05) are valid in the range $0 < \beta < 1$, indicating that the agricultural products with weak comparative advantage initially increase over time, while products with strong comparative advantage are reduced initially. In other words, Vietnam loses its competitive advantage among the initially strong competitive agri-product, while gaining a competitive advantage among the initially weak competitive agri-products.

Results interpretation: Vietnam's agricultural export advantage model is based on natural resources with major agricultural products, so Vietnam increases production and exports of agricultural products with a strong competitive advantage to the use of higher opportunity cost resources. Therefore, the competitive advantage of these products has gradually decreased. On the other hand, agricultural products with weak competitive advantage still have abundant resources and lower opportunity costs, so their competitive advantages rise. This result is also consistent with the traditional economic theory which explains that a country tends to reduce its competitive advantage in products as it specializes and exports its products to the market.

4.3. Result Analysis of the trend of comparative advantage in the period 2003-2018

Model (2) $CA_{jt} = \alpha_j + \beta_j + \varepsilon_{jt}$ is estimated by least-squares method. The estimation results of the coefficient β and the probability value (P-value) in the hypothesis test β = 0 for each index of comparative advantage and by agri-products with codes from HS01 to HS24 in the period 2003-2018 are given in table 6.

(Explanation: β is the regression coefficient in the model $CA_{jt} = \alpha_j + \beta_j + \varepsilon_{jt}$ where CA is the comparative advantage index, including RCA, RSCA, RTA, NEI, over the period 2003-2018).

The results show that:

- Agri-products exported to the EU during the study period tended to gain comparative advantage (RCA and RSCA have β > 0 with P-value ≤ 0.05), including those with code HS05 (Products of animal origin, not elsewhere specified or included) and HS15 (Animal or vegetable fats and oils and their cleavage products; prepared edible fats; animal or vegetable waxes); HS18 (Cocoa and cocoa preparations).

- Agri-products exported to the EU tends to lose comparative advantage (RCS and RSCA have β < 0 with P-value ≤ 0.1), including those with HS codes 02, 04, 07, 09, 10, 14, 19, 20, 24.

- Agri-products exported to the EU tends to increase net exports (NEI has β > 0 with P-value ≤ 0.05), including those with HS codes 15, 17, 18, 21.

- Agri-products exported to the EU tends to decrease net exports (NEI has β > 0 with P-value ≤ 0.05), including those with HS codes 01, 02, 03, 06, 07, 08, 10, 20, 24.

5. Conclusions and Recommendations

Conclusions

The results of comparative advantage analysis including four indicators RCA, RSCA, RTA, and NEI in the agricultural products exported to the EU

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Table 6: *Estimation result of coefficients β on the trend of comparative advantage indices*

Indicator	RCA		RSCA		RTA		NEI	
HS	β	P-value	β	P-value	β	P-value	β	P-value
HS01	-0.081	0.291	-0.012	0.249	-0.085	0.297	-0.065	0.000
HS02	-0.004	0.099	-0.006	0.084	-0.154	0.231	-0.098	0.001
HS03	-0.517	0.131	-0.020	0.055	-1.517	0.003	-0.033	0.000
HS04	-0.069	0.024	-0.047	0.024	0.163	0.176	-0.009	0.059
HS05	0.015	0.063	0.015	0.051	-0.468	0.044	-0.010	0.178
HS06	0.002	0.782	0.004	0.694	-0.322	0.000	-0.032	0.000
HS07	-0.041	0.000	-0.041	0.000	-0.050	0.000	-0.023	0.000
HS08	-0.025	0.702	0.000	0.953	-0.061	0.355	-0.001	0.000
HS09	-2.024	0.002	-0.010	0.000	-2.062	0.002	0.000	0.000
HS10	-0.071	0.063	-0.051	0.006	-0.233	0.049	-0.092	0.001
HS11	-0.042	0.431	-0.005	0.628	-0.358	0.126	0.002	0.215
HS12	-0.001	0.689	-0.001	0.679	0.148	0.248	0.018	0.170
HS13	0.000	0.957	-0.001	0.949	0.008	0.959	0.005	0.617
HS14	-0.215	0.000	-0.081	0.000	-0.241	0.000	-0.004	0.072
HS15	0.003	0.024	0.005	0.024	-0.010	0.181	0.038	0.013
HS16	-0.034	0.699	0.001	0.862	-0.038	0.635	0.001	0.081
HS17	0.008	0.349	0.010	0.286	0.030	0.345	0.033	0.006
HS18	0.003	0.066	0.006	0.058	-0.004	0.572	0.037	0.011
HS19	-0.565	0.004	-0.022	0.000	-0.306	0.012	0.001	0.873
HS20	-0.047	0.041	-0.031	0.011	-0.071	0.009	-0.027	0.000
HS21	0.026	0.417	0.011	0.394	0.368	0.001	0.053	0.000
HS22	0.000	0.912	0.001	0.829	-0.051	0.040	-0.002	0.451
HS23	0.005	0.101	0.009	0.085	-0.416	0.082	-0.006	0.477
HS24	-0.020	0.002	-0.030	0.001	-0.039	0.039	-0.061	0.000

Source: Author's estimation results from Comtrade data

with codes from HS01 to HS24 over the period 2003-2018 show that: (i) those product codes with comparative advantage and export specialization are HS09 (Coffee, tea, mate and spices); HS16 (Preparations of meat, of fish or of crustaceans, molluscs or other aquatic invertebrates); HS01 (Live animals); HS03 (Fish and crustaceans, molluscs and other aquatic invertebrates); (ii) agricultural products with comparative advantage but without export specialization consist of HS11 (Products of the milling industry; malt; starches; inulin; wheat gluten); HS19 (Preparations of cereals, flour, starch or milk; pastrycooks' products); HS21 (Miscellaneous edible preparations); (iii) those having export specialization but without comparative advantage are mainly vegetables and products from vegetables, fruits, seeds and grains; additionally, most products from processed food do not have either comparative advantage or export specialization.

Analysis of the stability of comparative advantage shows that Vietnam's agricultural exports to the EU have comparative advantage convergence over time (coefficients $0 < \beta < 1$); additionally, agricultural products with weak comparative advantage ini-

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tially increase over time, while agricultural products with strong comparative advantage initially decrease.

Analysis of trends of comparative advantage shows that agricultural products exported to the EU tends to (i) gain comparative advantage over time, including HS05 (Products of animal origin, not elsewhere specified or included) and HS15 (Animal or vegetable fats and oils and their cleavage products; prepared edible fats; animal or vegetable waxes); HS18 (Cocoa and cocoa preparations); (ii) lose comparative advantage over time, including agricultural products with HS codes 02, 04, 07, 09, 10, 14, 19, 20, 24; (iii) decrease net exports. Only a few agricultural commodities tends to increase net exports, including HS codes 15, 17, 18, 21.

Recommendations from research results

- For agricultural products with comparative advantage and high export specialization: Vietnam needs to improve export efficiency and supplement resources such as investment capital; human capital to take advantage of and promote comparative advantage.

- For agricultural products with comparative advantage without export specialization: Vietnamese managers and policymakers need to develop policies to improve quality and output, promote export, and support enterprises to access and expand export markets.

- For those with export specialization without comparative advantage: it is necessary to invest in renovating production processes to improve quality and reduce production costs, and to increase product competitiveness to meet the needs of the domestic market and the foreign market. Moreoever, diversify export products and change from exporting raw products to exporting processed products.

- For those that do not have either comparative advantage or export specialization: it is necessary to take advantage of the available raw materials of the product; improve productivity and quality; and also invest in production and processing lines of agricultural products for meeting export standards to improve the comparative advantage.

- To take advantage of the comparative advantage and the stability and trend characteristics over time of agri-export advantage indices into both the EU market and the world market, Vietnam needs to develop policies in order to sustainably improve the productivity and quality of agricultural products based on a global value chain approach and focus on upgrading production technology, international quality standards, vertical and horizontal alignment, farm management, and market information systems. Vietnam also needs to transform models of comparative advantage from low value-added primary agricultural products to processed food industries and high value-added products.◆

References:

1. Balassa, B. (1965), *Trade liberalisation and "revealed" comparative advantage*, The Manchester School, Vol. 33, No. 2, pp. 99-123. DOI 10.1111/j.1467-9957.1965.tb00050.x.

2. Banterle, A. and Carraresi, L. (2007), *Competitive performance analysis and European Union trade: The case of the prepared swine meat sector*, Acta Agriculturae Scandinavica, Sec. C, Vol. 4, No. 3, pp. 159-172. ISSN 2164-828X/2164-8298. DOI 10.1080/16507540701597048.

3. Benedictis, L. D. and Tamberi, M. (2004), *Overall specialization empirics: techniques and applications,* Open economies review, Vol. 15, No. 4, pp. 323-346. ISSN 0923-7992/1573-708X.

4. Birol Erkan, Kazım Sarıcoban (2014), *Comparative Analysis of the Competitiveness in the Export of Science-Based Goods Regarding Turkey and the EU+13 Countries*, International Journal of Business and Social Science, Vol. 5, No. 8(1); July 2014

5. Cantwell, J. (1989), *Technological innovation and multinational corporations*, Cambridge: B. Blackwell

6. Ferto, I. and Hubbard, L. J. (2003), *Revealed comparative advantage and competitiveness in Hungarian agri-food sectors*, The World Economy,

ISSN 1859-3666

Vol. 26, No. 2, pp. 247-259. ISSN 1467-9701. DOI 10.1111/1467-9701.00520.

7. Hart, P. E. and Prais, S. J. (1956), *The analysis of business concentration: a statistical approach*, Journal of the Royal Statistical Society, Vol. 119, No. 2, pp. 150-191. DOI 10.2307/2342882.

8. Liesner, H. H. (1958), *The European common market and British industry*, The Economic Journal, Vol. 68, No. 270, pp. 302-316. ISSN 1468-0297. DOI 10.2307/2227597.

9. Proudman, J. and Redding, S. (2000), *Evolving patterns of international trade*, Review of international economics, Vo. 8, No.3, pp. 373-396. ISSN 1467-9396. DOI 10.1111/1467-9396.00229.

10. Ricardo, D. (1817), *On the principles of political economy and taxation*, London: John Murray.

11. Vollrath, T. (1991), *A theoretical evaluation of alternative trade intensity measures of revealed comparative advantage*, Review of World Economics, Vol. 127, No. 2, pp. 265-280. ISSN 1610-2878/1610-2886.

12. Viet Van Hoang, Khai Tien Tran, Binh Van Tu (2017), *Assessing the Agricultural Competitive Advantage by the RTA index: A Case Study in Vietnam*, Agris on-line Papers in Economics and Informatics, Number 3, 2017.

13. https://comtrade.un.org/data, accessed February 1, 2020.

14. https://ec.europa.eu/eurostat/data/database, accessed February 1, 2020

Summary

Bài viết này nhằm mục đích đánh giá lợi thế so sánh của nông sản Việt Nam xuất khẩu sang thị trường EU, đồng thời phân tích tính ổn định và tính xu thế của lợi thế so sánh trong giai đoạn 2003-2018. Kết quả cho thấy: (i) Việt Nam có lợi thế so sánh và chuyên môn hóa xuất khẩu trong nhóm nông sản theo mã HS trong hệ thống hài hòa thuế quan gồm: Cà phê, chè và gia vị (HS09); Trái cây và các loại hạt ăn được (HS08); Cá và các chế phẩm từ thịt, cá (HS03, HS16); (ii) Nhóm nông sản có lợi thế so sánh nhưng chưa chuyên môn hóa xuất khẩu gồm: Sản phẩm của ngành xay xát; mạch nha; tinh bột (HS11); Các chế phẩm từ ngũ cốc, bột, tinh bột (HS19); Các chế phẩm ăn được khác (HS21); (iii) Nhóm nông sản chuyên môn hóa xuất khẩu nhưng không có lợi thế so sánh chủ yếu thuộc nhóm rau và chế phẩm từ rau, quả, hạt, ngũ cốc; (iv) Nhóm nông sản không có lợi thế so sánh hoặc chuyên môn hóa xuất khẩu chủ yếu thuộc nhóm thực phẩm chế biến. Hơn nữa, nông sản xuất khẩu của Việt Nam sang EU có lợi thế so sánh hội tụ theo thời gian và các nhóm nông sản có lợi thế so sánh yếu ban đầu sẽ tăng lên theo thời gian, trong khi các nông sản có lợi thế so sánh mạnh ban đầu sẽ giảm theo thời gian. Từ các kết quả phân tích định lượng, nghiên cứu đề xuất các khuyến nghị mang hàm ý chính sách nhằm phát huy lợi thế so sánh, đồng thời xây dựng chiến lược xuất khẩu theo từng nhóm nông sản Việt Nam.

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