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COMPARATIVE ADVANTAGES OF VIETNAM'S SEAFOOD EXPORTED TO THE JAPANESE MARKET

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This research aims to study the comparative advantage of seafood exported from Vietnam to the Japanese market. During the research process, the authors analyzed the comparative advantage of Vietnamese seafood exported to the Japanese market through comparative advantage indexes including RCA, and regional orientation RO index for the period 2011-2020. Through research, groups of goods with codes HS0304, HS0306, and HS1605 have a high comparative advantage. Other commodity groups in Vietnam are gradually losing their comparative advantage. In addition, the authors chose China and Norway to compare, which are two major exporters of seafood to Japan. From the research results, the authors propose solutions to improve comparative advantage for groups of seafood with high comparative advantage and those with low or no comparative advantage and develop the supply chain of seafood for export.

Keywords: *Comparative advantage, RCA, Vietnamese seafood, exports, Japan.*

JEL Classifications: *F10, F12*

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1. Introduction

Seafood is considered one of the main export items of Vietnam. According to statistics from the General Department of Vietnam Customs, in the 10 groups of goods with the largest export value in 2021, seafood ranked 9th with an export value of 8.89 billion USD. Japan is one of the three main seafood export markets of Vietnam. Specifically, in 2021, the Japanese market ranked second, accounting for 14.9% of Vietnam's total seafood export turnover, reaching over 1.33 billion USD, behind the United States with 2.05 billion USD. According to data from the Import-Export Department (Ministry of Industry and Trade), citing statistics from the Japanese Customs Agency every month, Vietnam is always in the top 5 largest seafood supply markets for Japan along with other markets such as China, Norway, Chile, and Thailand. In general, to supply seafood to foreign markets, Vietnam does it through the stages of farming or catching, processing, packaging, preserving, and exporting (Figure 1). Vietnam also applies this model to supply seafood to the Japanese market.

In the period 2011-2020, the value of Vietnam's seafood exported to the Japanese market did not change much. In recent years, the value of Vietnamese seafood exported to Japan is relatively high, affirming the position and prestige of Vietnamese seafood. In the context that Vietnam is increasingly opening up, and signing trade agreements, seafood exporters have more favorable conditions with the incentives from the Japanese mar-

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Figure 1: *Supply chain of seafood exports from Vietnam to foreign markets*

ket. Although tariff barriers are removed, Japan has instead applied stricter standards, requiring businesses to constantly improve the quality of exported seafood. Therefore, it is necessary to study the comparative advantage of seafood products exported to the Japanese market for the purpose of classifying and selecting key products (those with high comparative advantage), and at the same time determine which stage businesses need to focus on in the process of supplying seafood to the Japanese market. From there, the authors propose some solutions to improve the comparative advantage of Vietnam's seafood exports and develop the domestic seafood supply chain for the Japanese market.

2. Literature review and Methods

2.1. Literature review

2.1.1. Research on comparative advantage

Comparative advantage is an economic term that refers to an economy's ability to produce goods and services at a lower opportunity cost than its trading partners. The theory of comparative advantage was first developed by the British economist David Ricardo in 1817 and mentioned in his work "On the Principles of Political Economy and Taxation". D. Ricardo drew on the law of comparative advantage: each country should specialize in the production and export of goods in which it has a comparative advantage and import goods in which it has little advantage. As a result, the total output of each product in the world will increase and all countries will benefit. D. Ricardo's theory of comparative advantage is put forward on the based ones, which create fundamental limitations when omitting factors: land, capital, technology, and substitute products; market demand; source of costs or cost factors reduced by economies of scale.

To overcome the limitations of comparative advantage theory, Gottfried Haberler developed the theory of comparative advantage over opportunity cost in 1930. Haberler's theory has overcome the limitation of D. Ricardo relate it assumes that there is only one factor of production, labor and that the relative price is determined by opportunity cost. The opportunity cost of one product is measured by the amount of another product that must be given up to devote to producing that product.

From another point of view, the Heckscher - Ohlin (H-O) model has been justified theory of Eli Hechsher (1919) by Bertil in the work "Interregional and International Trade". The H-O model deals with two factors: intensity and redundancy. In particular, the intensive factor is understood to produce a product, it is necessary to use more factors of production than other products. Factor redundancy is understood as resources to produce excess products while resources to produce other products are less (scarce resources). According to the H-O model, a country has a comparative advantage in the production, exports of factor-intensive products that are relatively abundant, and imports of factor-intensive products for which it is relatively abundant countries are relatively scarce (Ohlin, 1993).

Later, more economists researched and developed theories of comparative advantage. Specifically, Samuelson extended the H-O model to the H-O-S (Heckscher-Ohlin-Samuelson) model: "Differences in the prices of factors of production between countries give rise to international trade, and through International trade will gradually reduce price differences leading to relative and absolute equilibrium in the prices of factors of production between countries" (Samuelson, 1954). In addition, the H-S-O model (Heckscher-Ohlin-Vanek) was created when Vanek (1968) added conditions to the equilibrium factor price and production technology level.

2.1.2. Research on the comparative advantage of exported seafood products

Around the world, there have been a number of studies on the comparative advantage of seafood exported. Some articles study the general comparative advantage of seafood exported, while others specifically study the comparative advantage of one or several groups of exported seafood products.

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Analysis of comparative advantage of the export seafood, Saricoban and Kaya (2017) used the Revealed Comparative advantage method to determine the seafood export competitiveness. They found that Vietnam, Denmark, and Chile had a lower share of global seafood export but had specialization and comparative advantages in exporting seafood. By contrast, the USA which had a higher share didn't have competitive advantages. In other the article *Revealed Comparative Advantage of selected ASEAN countries' crustacean export to Japan* (2020), the author studied the factors influencing the revealed comparative advantage of six ASEAN countries' Japanese crustacean import partners (Vietnam, Indonesia, Thailand, Myanmar, the Philippines, and Malaysia), with a particular interest in the effect of Acute Hepatopancreatic Necrosis Disease (AHPND). The result shows that the RCA of crustancean was affected by AHPND and the exchange rate of selected ASEAN exporters to Japan.

In addition, there are studies evaluating the comparative advantage of one or several groups of exported seafood. In the article *"The export competitiveness of the tuna industry in Thailand",* Kuldilok et al. (2013) pointed out that Thailand had a comparative advantage in all major export markets. These prices have remained stable in the United States, the Middle East, Japan and Canada but have decreased significantly in Australia. For the US market, Nisar et all (2020) found that India has a strong comparative advantage in exporting crustaceans, molluscs, and frozen fish to the USA market from 2000 to 2017. In another study, Ramli et al (2020) studied the competitiveness and analyzed the determinants of Indonesia's tuna exports to importing countries (Japan, the United States, and Thailand) from 2001 to 2016. Research results show that the RTA index of Indonesia's tuna products has a great comparative advantage in all three main markets: Japan, the United States, and Thailand.

Through the research overview, it can be seen that the studies have analyzed and evaluated the comparative advantages of seafood exports in some countries. The main tool for assessment is the RCA index. However, studies have not specifically studied the comparative advantage of seafood exported to a particular market.

2.2. Methods

2.2.1. Data collection

To study comparative advantage, the authors collect secondary data on the export value of seafood products from Vietnam, China, Norway, the whole world and the value of seafood imports from Japan with the 4-digit HS code from the updated database on the trade situation of countries established by the International Trade Center, Trade statistics for international business development (TRADE MAP). In addition, secondary data is obtained from other reliable sources such as the Vietnam Association of Seafood Exporters and Producers (VASEP), the General Department of Vietnam Customs, the export seafood reports of the Ministry of Industry and Trade of the socialist republic of Vietnam, Vietnam Trade Office in Japan etc.

2.2.2. Data processing

After collecting data, the authors used the comparative advantage evaluation index including the Revealed Comparative Advantage RCA, and the Regional Orientation RO to measure the comparative advantage of Vietnam's seafood exports to the Japanese market.

a. Revealed Comparative Advantage (RCA)

The Revealed Comparative Advantage (RCA) index (Balassa, 1965) shows a country's relative advantage or disadvantage for a certain product by comparing the share of this product in a country's total exports with its share of the world's total exports.

Formula:

$$RCA = \frac{X_{ij}/X_i}{X_{wj}/X_w}$$

In there:

RCA is the Revealed Comparative Advantage shown in the exports of country i for product j;

X_{ij} is the export value of product j of country i;

X_i is the total export turnover of country i;

X_{wj} is the export value of product j worldwide;

X_w is total world exports.

Significance: If RCA > 1, country i has a comparative advantage over product j. If RCA < 1 then country i have no comparative advantage over product j. To specifically assess the level of comparative advantage, Hinloopen (2001) divided RCA into 4 groups:

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- Group 1: 0 < RCA ≤ 1: No comparative advantage;
- Group 2: 1 < RCA ≤ 2: Low comparative advantage;
- Group 3: 2 < RCA ≤ 4: Mean comparative advantage;
- Group 4: 4 ≤ RCA: High comparative advantage.

RCA is an index to evaluate a country's comparative advantage in a product or industry. The higher the RCA, the more the country has a comparative advantage in the production of the product or industry. Conversely, a low RCA indicates that the country has a low or no comparative advantage in terms of products or industries. With this in mind, the RCA can be used as a basis for international trade policy-making and export production orientation for the country.

b. Regional orientation RO index

Although the RCA is commonly used to assess a country's comparative advantage. However, RCA only reflects the comparative advantage of the product in the world market in general, not in any specific market. Therefore, assessing the comparative advantage of a product in a particular market should be based on the Regional Orientation (RO) index. According to research by Yeats (1998) and Yamazawa (1970), the goods of a country are often concentrated in consumption in one or a number of certain market areas. Therefore, when determining the comparative advantage in each specific market, RO will measure the importance of intra-regional exports compared to exports outside the region.

Formula:

$$RO_{kij} = \frac{X_{kij} / X_{ki}}{X_{ki-j} / X_{i-j}}$$

In there:

X_{kij}: the export turnover of product k of country i to region j;

X_{ki} : the total export turnover of product k of country i;

X_{ki-j}: the export turnover of product k of country i to foreign countries j;

X_{i-j} : the export turnover of country i to the region outside j.

Meaning: If RO > 1, then intra-regional exports are higher than non-regional exports; RO < 1, the intra-regional export is lower than the foreign-regional export.

3. Results and discussion

3.1. Reality of seafood exports from Vietnam to Japan

3.1.1. Seafood import demand in the Japanese market

Japan is one of the markets that have a high demand for seafood imports in the world. The value of seafood consumption per capita in Japan in 2019 was 70.6 USD, a slight increase compared to 2016 was 69.6 USD. Japanese consumers are considered to be one of the most demanding customers regarding the quality and freshness of seafood products. Even the Japanese are willing to pay relatively high prices to buy seafood products of high quality and freshness. Therefore, enterprises that have entered the Japanese market will have the opportunity to achieve high profits if they meet customer requirements well.

In addition, Japanese consumers are very conscious of keeping their health, they will choose foods with high nutrients and good for health. And seafood is the product consumed by Japanese people every day. Therefore, it can be confirmed that the demand for seafood in Japan is high, leading to high import demand.

Besides, due to the change due to urbanization, and the COVID-19 pandemic, the way Japanese people consume seafood also changed. They tend to consume convenience products (boneless, easy-to-cook or pre-packaged fish). Instead of eating at a restaurant, the Japanese have the habit of processing and cooking at home. The change in market demand requires businesses to promptly capture and export products according to consumer trends and always ensure quality.

3.1.2. The reality of Vietnam's seafood exports to the Japanese market

a. Export turnover

In general, according to the chart, the export turnover of Vietnamese seafood to the Japanese market has not changed much, mainly with an increasing trend. However, in 2015, seafood export turnover to the Japanese market had a clear

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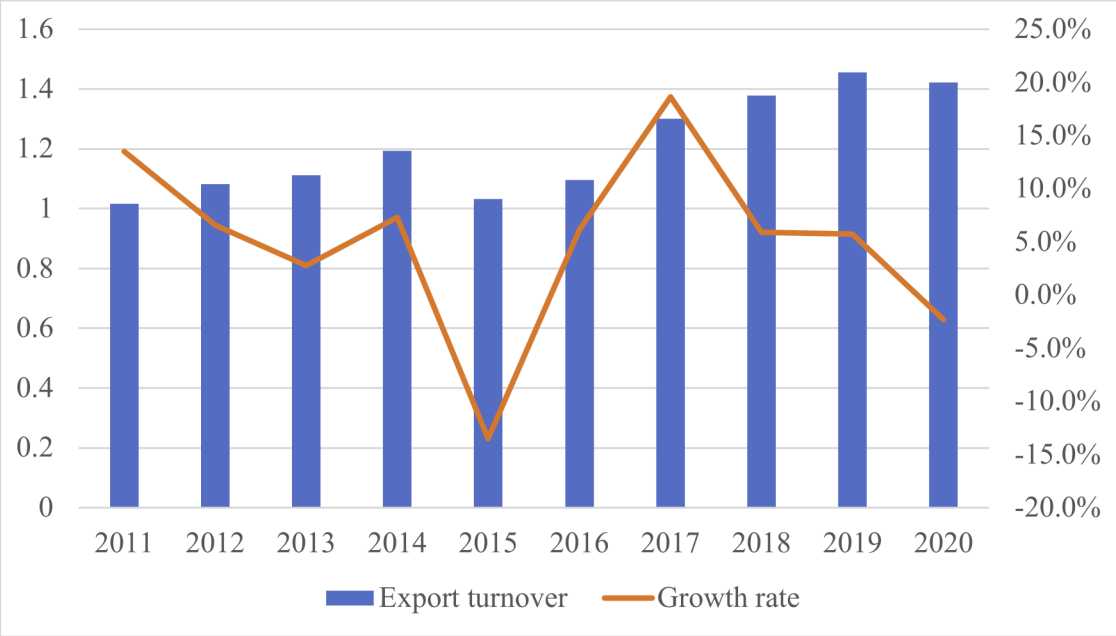

Source: Author calculated from Trademap.org data

Chart 1: *Vietnam's seafood exports turnover to Japan in the period 2011-2020 (billion USD)*

decrease, reaching only 1.03 billion USD, down 13.5% over the previous year. The main reason for such a sharp decline in 2015 is that Japan is increasingly applying more stringent standards on food safety and hygiene. Mr. Truong Dinh Hoe, General Secretary of the Vietnam Association of Seafood Exporters and Producers (VASEP) emphasized: "Vietnam's seafood products are weaker in quality and price compared to other seafood export markets. Even for the two nearest countries, Indonesia and Malaysia, we are still more disadvantaged because these two countries have more incentives when exporting to Japan. This proves that Vietnamese seafood exporters to Japan face stiff competition from countries such as India, Indonesia, and Malaysia, where the seafood price is cheaper.

In the 2016-2020 period, facing challenges from 2015, Vietnamese seafood has proven its product quality to the Japanese market. Therefore, seafood export turnover to the Japanese market has increased over the years. In particular, 2017 saw a leap when the growth rate compared to the previous year reached 18.6%, the highest in the 2011-2020 period. At this time, the US and EU reduced their purchases of Vietnamese seafood. Specifically, according to the analysis of VASEP, anti-dumping tax and increase in raw shrimp prices are the main reasons leading to a sharp decrease in shrimp sales to the US. Besides, in the EU market, seafood export turnover also decreased due to a sharp decrease in pangasius exports to the EU. In addition, the yen appreciated, so seafood businesses, especially shrimp businesses, switched to exploiting this market strongly. Therefore, in 2017, Vietnam's seafood export turnover to Japan increased sharply (about 0.3 billion USD). After 2017, Vietnam's seafood export turnover to Japan increased steadily, nearly 6% over the previous year. However, in 2020, there is a slight decrease in seafood export turnover. The main cause of the decline is countries and businesses that are negatively impacted by the COVID-19 pandemic. The COVID-19 epidemic has reduced the ability of aquaculture in the world, including in Vietnam.

In general, the export turnover of Vietnamese seafood to the Japanese market is relatively stable, contributing to Vietnam's economic growth.

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b. Export structure

Table 1: *Description of seafood export products by HS code*

HS Code	Product label
0301	Live fish
0302	Fish, fresh or chilled (excluding fish fillets and other fish meat of heading 0304)
0303	Frozen fish (excluding fish fillets and other fish meat of heading 0304)
0304	Fish fillets and other fish meat, whether or not minced, fresh, chilled or frozen
0305	Fish, fit for human consumption, dried, salted or in brine; smoked fish, fit for human consumption, whether or not cooked before or during the smoking process; flours, meals and pellets of fish, fit for human consumption
0306	Crustaceans, whether in shell or not, live, fresh, chilled, frozen, dried, salted or in brine, even smoked, incl. crustaceans in shell cooked by steaming or by boiling in water; flours, meals and pellets of crustaceans, fit for human consumption
0307	Molluscs, fit for human consumption, even smoked, whether in shell or not, live, fresh, chilled, frozen, dried, salted or in brine; flours, meals and pellets of molluscs, fit for human consumption
0308	Aquatic invertebrates other than crustaceans and molluscs, live, fresh, chilled, frozen, dried, salted or in brine, even smoked; flours, meals and pellets of aquatic invertebrates other than crustaceans and molluscs, fit for human consumption
1504	Fats and oils and their fractions of fish or marine mammals, whether or not refined (excluding chemically modified)
1603	Extracts and juices of meat, fish or crustaceans, molluscs and other aquatic invertebrates
1604	Prepared or preserved fish; caviar and caviar substitutes prepared from fish eggs
1605	Crustaceans, molluscs and other aquatic invertebrates, prepared or preserved (excluding smoked)

Products marked with HS codes are part of the World Customs Organization's Harmonized Commodity Description and Coding System, using both four-digit codes (HS4). With a four-digit code level, it is possible to see the fluctuations in the seafood trade between Vietnam and countries around the world.

The Japanese market is one of the three most difficult markets to import Vietnamese seafood. In terms of product structure, it can be seen that products belonging to HS code groups 0304, 0306, 1604 and 1605 are the main product groups imported from Vietnam by Japan. Specifically, the structure of seafood products exported from Vietnam to the Japanese market in 2015, and 2020 is shown in chart 2 and chart 3 below.

Over time, the structure of Vietnamese seafood exports to Japan has changed.

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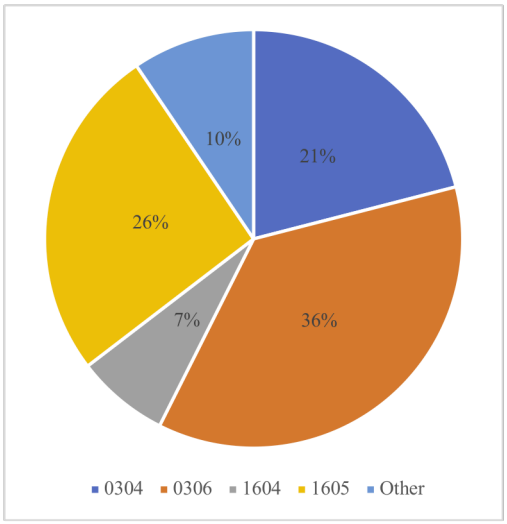
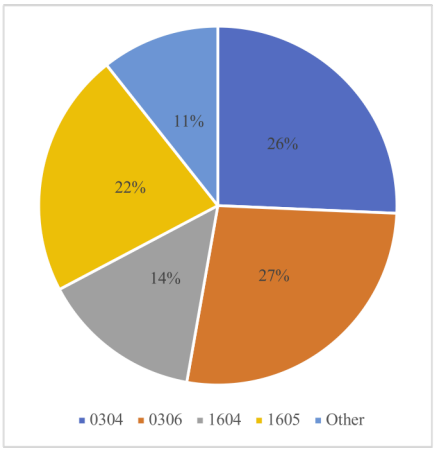
Code HS0306

The product group with the HS0306 code is more dominant than the rest, but the percentage has changed (in 2020, the structure of HS0306 products has decreased by 9%, from 36% to 27% in 2015). In this group, shrimp accounts for a large number of export items. Vietnam has exported several shrimp products including frozen powder coated shrimp, frozen steamed black tiger shrimp, frozen steamed black tiger shrimp, frozen boiled white shrimp with tail, and frozen steamed shrimp with head and tail removed. Although we have focused on promoting shrimp exports to the Japanese market, in 2020 the COVID-19 pandemic has caused many difficulties for farming households as well as purchasing businesses due to prolonged blockade and isolation orders. According to data from Vietnam Customs, Vietnam's shrimp exports have not recorded growth recently. In 2020, according to statistics from the Vietnam General Department of Customs, shrimp exports reached 613 million USD, down 0.9% compared to 2019. In 2021, shrimp exports reached 578 million USD, down 6% compared to 2020.



Source: Author calculated from Trademap.org data

Chart 2: *Structure of Vietnam's seafood exports to Japan in 2015 (HS code)*



Source: Author calculated from Trademap.org data

Chart 3: *Structure of Vietnam's seafood exports to Japan in 2020 (HS code)*

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Code HS1605

Besides the product HS0306, the product with the code HS1605 occupies the second position. This product group includes processed products such as squid, octopus, etc. The export of Vietnamese squid and octopus to Japan has not been stable growth. Up to now, Japan is the second largest import market of Vietnam's squid and octopus, after South Korea, accounting for 22% of Vietnam's total export value of squid and octopus. However, in 2020, the amount of octopus and squid exported decreased. This makes the export structure of the HS1605 product group in 2020 decrease compared to 2015. The most exported products include frozen octopus, frozen processed octopus, frozen blanched processed octopus, frozen cleaned squid, frozen breaded octopus, frozen cuttlefish, frozen sliced squid, frozen processed squid fillet, frozen boiled cut octopus… The average export price of Vietnamese squid is about 9.2 - 10.8 USD/kg while the average export price of Vietnamese octopus is in the range of 8.1 - 9.2 USD/kg.

Code HS0304

In addition to processed products, fish fillets and other fish meat products have had a clear structural change. In 2015, the HS0304 accounted for only 21%, and by 2020, the proportion will increase to 26%. The increase in proportion is due to the trend of changing consumer demand of customers, including Japanese customers. The COVID-19 pandemic has made consumers more aware of the benefits of seafood, so the demand for seafood has increased, especially those that are lightly processed. In particular, Vietnam has promoted the export of tuna fish fillets and tuna meat to the Japanese market. However, in the first period of 2010-2015, tuna exports still faced many difficulties because there were many suppliers from countries around the world. By 2020, Vietnam's tuna export value has increased for more than the first half of the year, but due to the impact of the COVID-19 pandemic, consumers' habits have changed, causing sales of tuna to decrease. In addition, the increase in share is due to other fish and meat fillet products.

Code HS1604

The HS1604 group of products includes caviar, processed fish, etc. As can be seen from the two charts above, the structure of products with the HS1604 code has increased sharply (2 times in 2020 compared to 2015). This shows that consumer demand has changed. Before, when there was no COVID-19 pandemic, Japanese customers tended to go out to eat more than to buy back. Therefore, the countries that supply seafood to Japan tend to supply fresh, pre-processed, or preserved products. This is also the reason why the product group HS1604 accounted for a small proportion in 2015. However, by 2020, consumers tend to consume seafood products at home instead of going to a restaurant. Therefore, Vietnam has changed export products to processed tuna products, frozen steamed tuna loins, etc., causing the proportion of HS1604 products to increase in 2020.

3.2. Results of the assessment of comparative advantages of Vietnamese seafood products exported to the Japanese market

3.2.1. Results according to RCA

The authors have calculated the RCA of seafood products according to the HS4 code. Calculation results are shown in Table 2. Through RCA results, it can be seen that in the period 2011 - 2020, our country has high comparative advantages in product groups 0304, 0306, and 1605; commodity groups 0305, 0307, and 1604 have the average comparative advantage; the group 1504 has low comparative advantage and the other groups have no comparative advantage.

In 2020, the products with code HS1504 with RCA = 1,114 represents a group of goods with low comparative advantage. However, by 2021, the RCA of this group is 0.995 < 1, proving that Vietnam no longer has a comparative advantage over this group.

Commodity groups 0305, 0307, and 1604 are products that Vietnam has an average comparative advantage with when considering RCA in 2020. But Vietnam has also gradually lost its comparative advantage with this product group, instead of having a comparative advantage. On average, the comparative advantage will be low in 2021. Specifically, the RCA comparative index in 2021 of items 0305, 0307, and 1604 are 1,783, 1,987, and 1,660 respectively.

Of the three groups of Vietnamese seafood with high comparative advantage in 2020 which are

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Table 2: *Results of calculating the RCA of seafood products (HS4 code)*

Year / Code	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
0301	0.587	0.645	0.755	0.524	0.553	0.528	0.507	0.428	0.353	0.565	0.680
0302	0.665	0.806	0.289	0.144	0.104	0.019	0.029	0.060	0.130	0.076	0.011
0303	1.510	1.458	1.375	1.315	1.531	1.556	1.546	1.238	1.066	0.891	0.863
0304	21.210	19.555	15.677	13.689	11.285	9.970	8.793	9.680	8.334	6.427	4.416
0305	2.697	2.536	1.844	1.477	1.374	1.745	2.292	2.468	2.681	2.875	1.738
0306	16.483	13.050	12.709	11.753	7.731	6.717	6.797	5.800	5.055	5.201	3.313
0307	8.661	7.439	5.284	4.666	3.403	2.778	3.358	3.359	2.753	2.819	1.987
0308	0.000	0.273	0.188	0.439	0.120	0.179	0.291	0.192	0.371	0.676	1.379
1504	7.654	6.450	5.760	3.451	1.464	1.545	1.382	1.091	1.720	1.114	0.995
1603	1.134	0.624	0.005	0.395	0.566	0.010	0.236	0.920	1.007	0.666	0.866
1604	3.626	3.620	3.509	3.366	2.821	2.732	2.615	2.409	2.637	2.316	1.660
1605	15.527	13.127	15.601	17.181	12.975	11.942	11.459	10.489	9.373	9.677	6.567

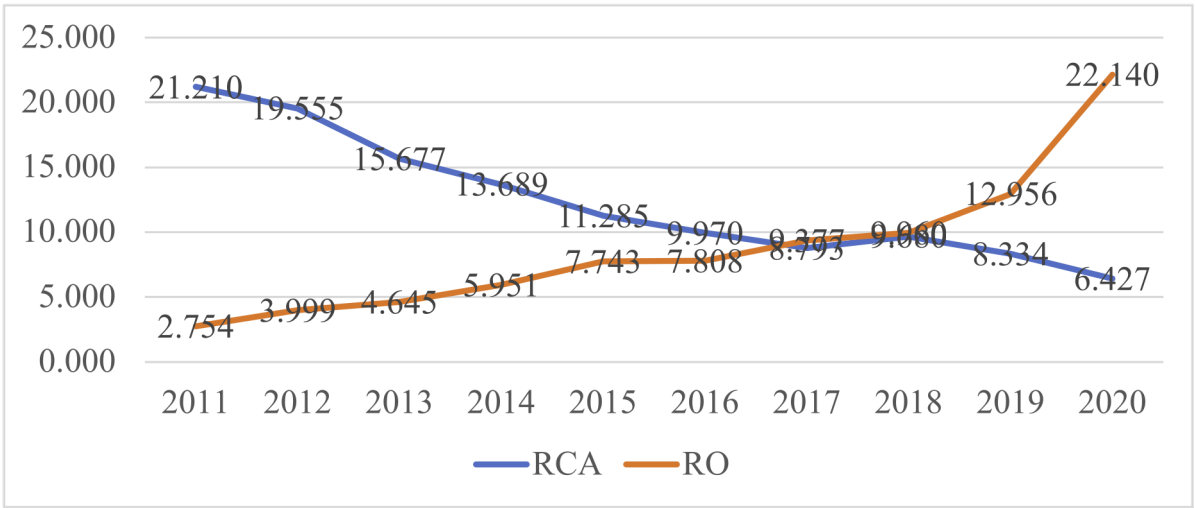
Source: Author calculated from Trademap.org data

0304, 0306, and 1605, by 2021, Vietnam has lost its high comparative advantage for products in group 0306. Two other groups of goods remain, maintaining RCA higher than 4. Specifically, the RCA of 0304 is 4,414 and RCA of1605 is 6,567. Although still maintaining a comparative advantage with two groups 0304 and 1605, it can be seen that the RCA tends to decrease over the years, alarming the loss of comparative advantage compared to other export seafood groups of Vietnam.

3.2.2. Results according to RO index

The authors analyze specifically the RCA and RO indexes of high comparative advantage Vietnamese seafood.

The RCA and RO indexes of the product code HS0304 are shown in Chart 4. In the HS0304 group,



Source: Author calculated from Trademap.org data

Chart 4: *RCA and RO indexes of product code HS0304*

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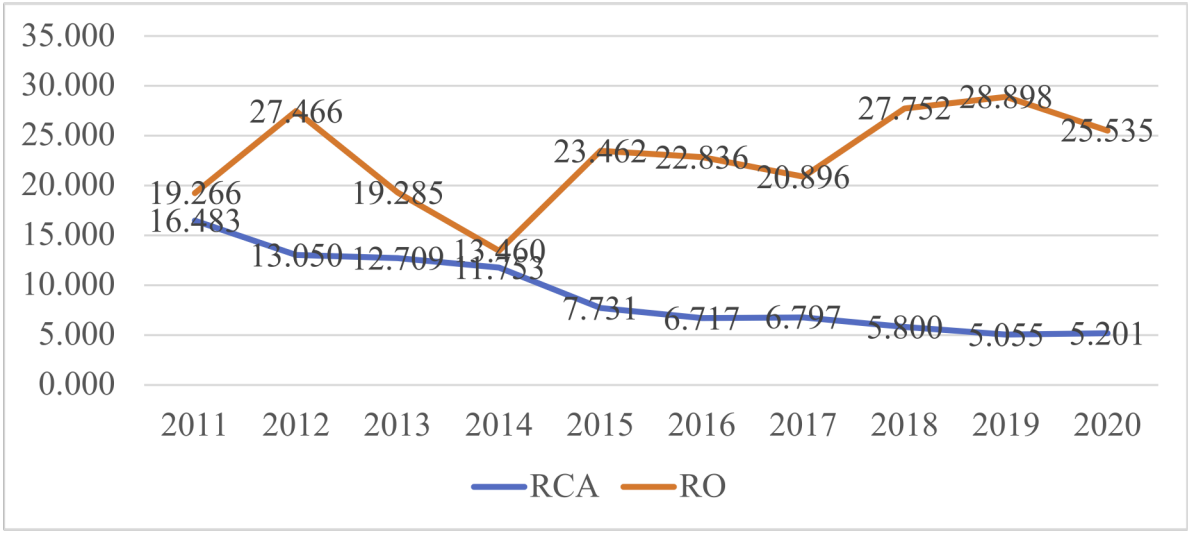
Vietnam mainly exports fish fillets and fish meat to Japan. This is a product in which our country has a high comparative advantage in the period 2011-2020. In 2021, although the RCA of the item decreased, it still showed a high comparative advantage. The comparative advantage of group 0304 decreased partly due to the decrease in fish quality, which did not meet the requirements of Japan, especially with tuna products. Contrary to the decreasing trend of RCA, RO increases over the years. The RO index of HS0304 products over the years has been greater than 1, proving that Vietnam's export of this product group to the Japanese market is higher than that of other regions in the world. Over the years, the RO has increased, proving that Vietnam focuses on promoting the export of 0304 product groups to the Japanese market. During the study period, the RO index in 2020 skyrocketed nearly 10 times higher than the RO index in 2011.



Source: Author calculated from Trademap.org data

Chart 5: *RCA and RO indexes of product code HS0306*

The RCA and RO indexes of the HS0306 group of products are shown in chart 5. For HS0306, Vietnam mainly exports wild-caught crustaceans including fresh and chilled lobsters; frozen, rock lobster, and other marine shrimp or brackish water culture including black tiger shrimp... Vietnam is the country that provides the most shrimp products to Japan, accounting for 25% of total shrimp imports into the market in 2016. After Vietnam, Thailand ranked second and Indonesia and India held the 3rd and 4th positions respectively. Although the RCA index gradually decreased over the years, Vietnam gradually lost its advantage. Compared with the HS0306 product group, however, the RO index proves that Vietnam's exports to Japan are larger than its exports to other sub-markets in the world. Thereby, it can be seen that Japan is Vietnam's target market. In addition, due to the impact of the COVID-19 pandemic, many aquaculture farmers faced difficulties, causing Vietnam to gradually lose its comparative advantage in this product. Therefore, although RO in 2020 is still high, it has decreased quite a lot compared to 2019. After two years of negative growth in 2020 and 2021, by 2022, Vietnam has boosted shrimp exports to the Japanese market. As of the first half of March 2022, shrimp exports to Japan reached over US$113 million, up 21% over the same period in 2021, this is a positive signal for shrimp in the Japanese market.

The RCA and RO indexes of the HS1605 product group are shown in chart 6. The 1605 group is the Vietnamese commodity group that maintains a relatively high comparative advantage. RCA has decreased over the years but not much, there are even periods of RCA increase such as the period of

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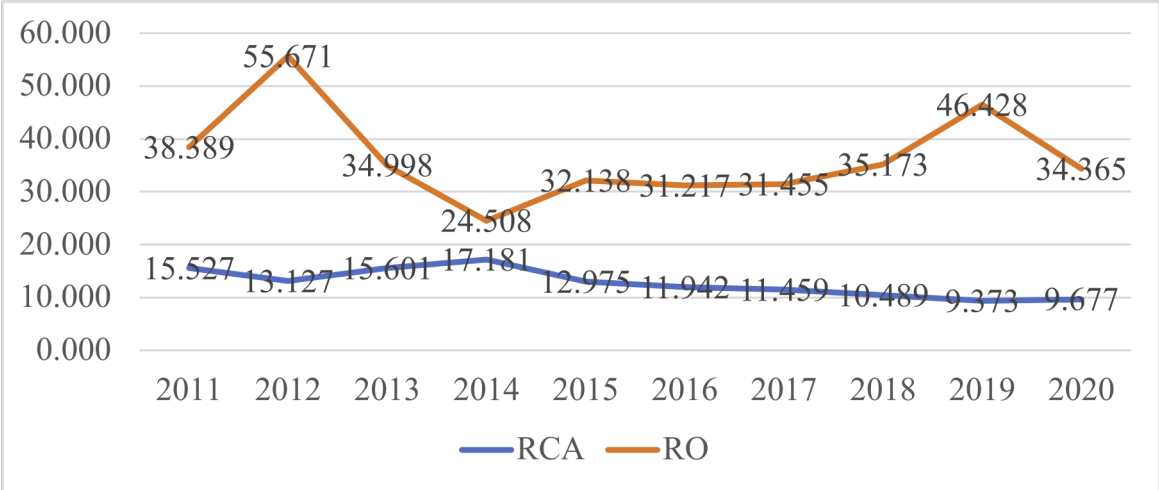

Source: Author calculated from Trademap.org data

Chart 6: *RCA and RO indexes of product code HS1605*

2012 - 1014 and the period of 2019 - 2020. The group's RCA peaked in 2014 with a value of 17,181, which is relatively high, while two other groups 0304 and 0306 peaked in 2011. The RO index of HS1605 is all greater than 1, showing that Vietnam's exports to the Japanese market are higher than that of other regions in the world. The RO index in 2012 shows that Japan imports a lot of HS1605 products from Vietnam. However, in the following years, RO decreased, proving that Japan imported products of the HS1605 group from many countries other than Vietnam. By 2019, Japan continued to import more items of group 1605 from Vietnam than other countries. Vietnam promotes exports to the Japanese market by taking advantage of favorable conditions brought by the CPTPP. However, in 2020, due to the impact of the COVID-19 pandemic, Vietnam's source of goods was also affected, leading to Japan also importing from other countries.

3.2.3. Comparing the high comparative advantage of Vietnamese seafood products with China and Norway

According to statistics of the Vietnam Trade Office in Japan, the 10 largest seafood exporters to Japan include China, Russia, Vietnam, Norway, etc. In which, China leads in seafood export value in this market. However, not all seafood products are exported to Japan, China and Norway have a comparative advantage in that product. To examine the comparative advantage of Vietnamese seafood with the high comparative advantage of China and Norway, the authors calculate the RCA index of the items code HS0304, HS0306, and HS1605 of those two countries. Specifically, the calculation results are shown in Table 3, Table 4, and Table 5.

For the product group with code HS0304, the calculation results show that China has a low comparative advantage and is increasingly losing its comparative advantage in this product group. Although China does not have a high comparative advantage, China has relatively high exports of HS0304 aquatic products, twice the value of Vietnam's products. In contrast to China, Norway has a high comparative advantage in HS0304 prod-

HS0304	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
China	2.0261	1.9091	1.7872	1.7015	1.5364	1.487	1.4695	1.3787	1.3026	0.9989	0.806
Norway	8.7476	8.6558	8.9906	10.163	11.194	14.238	13.877	11.921	14.977	20.065	14.16
Vietnam	21.210	19.555	15.677	13.689	11.285	9.970	8.793	9.680	8.334	6.427	4.416

Table 3: *Comparative results of China, Norway, and Vietnam's RCA products with code HS0304*
Source: Author calculated from Trademap.org data

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ucts. Comparative advantage has been consolidated by Norway and now their comparative advantage has grown even higher. That has helped Norway become the largest exporter of HS0304 products to the Japanese market. In summary, although Vietnam is a country with a high comparative advantage in HS0304, its export value is still inferior to China and Norway.

From the comparison with China and Norway which are two of the main seafood exporting countries to Japan, it can be seen that there are Vietnamese products with a high comparative advantage but the export value is not as high as China's. Although China does not have a high comparative advantage, it has promoted the export of many seafood products to the Japanese market.

Table 4: *Comparative results of China, Norway, and Vietnam's RCA products with code HS0306*

HS0306	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
China	0.6665	0.6712	0.6483	0.6033	0.5209	0.491	0.3928	0.338	0.2613	0.2383	0.186
Norway	0.3687	0.2982	0.3575	0.3953	0.711	0.9996	0.7681	0.7788	1.0491	1.2231	1.0633
Vietnam	16.483	13.050	12.709	11.753	7.731	6.717	6.797	5.800	5.055	5.201	3.313

Source: Author calculated from Trademap.org data

The results of the comparative RCA index on the HS0306 group show that China and Norway do not have a comparative advantage over this group of goods. Because there is no comparative advantage in this group of goods, the two countries have focused on exporting other products, rather than focusing too much on this group of goods. This is a good condition for Vietnam when it has a comparative advantage in the HS0306 commodity group. Vietnam is always in the group of three countries that export the most HS0306 products to the Japanese market (according to Trademap.org data).

4. Conclusion and solutions

4.1. Conclusion

In the period from 2011 to 2015, it can be seen that the existing comparative advantage of RCA of commodity groups HS0304, HS0306, and HS1605 has achieved impressive numbers with a high RCA index. With two other groups, HS0304 and HS0306 achieved a record comparative advantage in 2011. However, after that, Vietnam gradually lost its comparative advantage with these two commodity groups, which is shown by the gradual decrease of RCA over the years. For HS1605 products, Vietnam still maintains its comparative advantage, even

Table 5: *Comparative results of China, Norway, and Vietnam's RCA products with code HS1605*

HS1605	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
China	2.9848	3.2673	3.047	2.6793	2.3138	2.3935	2.7191	2.8461	2.4469	2.0693	2.3077
Norway	0.9592	0.9383	0.1024	0.1124	0.1239	0.1244	0.1448	0.16	0.1448	0.1361	0.0905
Vietnam	15.527	13.127	15.601	17.181	12.975	11.942	11.459	10.489	9.373	9.677	6.567

Source: Author calculated from Trademap.org data

The results of the HS1605 RCA index show that China has an average comparative advantage, but Norway does not have a comparative advantage in this product group. Although China has an average comparative advantage, its export value is larger than that of Vietnam. Vietnam ranks second after China among countries exporting HS1605 products to the Japanese market.

increasing its comparative advantage when RCA peaked in 2014. In addition, the explosion of the Fukushima nuclear power plant greatly affected operations. The domestic seafood supply, therefore, increases the demand for foreign seafood imports, which is a great opportunity for Vietnam. Vietnam has taken advantage of that opportunity and boosted exports to the potential Japanese market.

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In the next period from 2016 to 2020, Vietnam gradually loses its comparative advantage with major export groups, as RCA decreases. Many products move from high comparative advantage to moderate comparative advantage, from moderate to low comparative advantage, and from low to no comparative advantage. In October 2017, Vietnam was officially warned of a yellow card from the EC, affecting the reputation of Vietnam's seafood exports. Although participating in free trade agreements, Vietnam has many favorable conditions when Japan applies a 0% import tax rate. In parallel with such favorable conditions, Japan also applies trade barriers, and higher customer requirements, requiring seafood exporters in particular and Vietnam in general to improve their productivity, competitiveness as well as comparative advantage for key seafood products such as HS0304, HS0306, HS1605, and the rest.

In addition, although Vietnam has a high comparative advantage in some commodity groups, its output and export value are still inferior to some countries that do not have high comparative advantages, namely China. From that, it can be seen that Vietnam's seafood supply chain is still limited. Some limitations of Vietnamese seafood include:

- Businesses and fishermen have not exploited the full potential of our country, resulting in a relatively low farming area, and low efficiency of farming. The fishing means are still poor, there are few means of fishing that are capable of catching far from the shore, in large numbers.

- The quality is not high, leading to the low value of Vietnamese seafood products.

- Comparative advantage of commodities has not been exploited and maintained, leading to a decreasing comparative advantage of many seafood products.

Through the study of the comparative advantage of Vietnam's seafood exports to the Japanese market, it can be seen that in the export seafood supply chain, Vietnam still has limitations in the farming/fishing and processing stages. Therefore, in order to promote seafood exports to Japan, businesses need to focus on farming/fishing and processing seafood for export.

4.2. Solutions to improve the comparative advantage of exported seafood products, and contribute to the development of the export seafood supply chain

4.2.1. For the groups with high comparative advantage

Firstly, enterprises need to continue to research and improve products with high comparative advantage by looking for good quality input materials, thereby improving comparative advantages in production and *exporting* seafood.

Second, to enhance the comparative advantage of Vietnam's seafood industry, market development is essential. Enterprises need to actively coordinate with the Vietnam Association of Exporters and Producers, actively seek customers, and introduce products through international exhibitions, media, etc. to promote the export of products with high comparative advantage.

Third, recently, Vietnam has signed Free Trade Agreements, opening up many opportunities for businesses, including seafood enterprises to export. It is necessary for businesses to regularly update information about the market, incentives as well as standards to promptly meet and maintain the competitive advantage of Vietnam's seafood industry, and affirm its position in the market as well as the reputation of Vietnam's seafood exports.

4.2.2. For the goods with low or no comparative advantage

Besides focusing on commodity groups with high comparative advantage, Vietnam also needs some solutions for products with low comparative advantage or no comparative advantage.

One is the support of the Government. The Government needs to build a specific development model for these groups of goods to improve product quality. The government can base on and learn lessons from countries such as Argentina, China, Norway, etc. in aquaculture and seafood processing, especially those with low comparative advantage or no comparative advantage.

Second, businesses need to closely coordinate with VASEP to promptly grasp the needs of customers. From there, it is possible to find new oppor-

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tunities for products that do not have a comparative advantage or have a low comparative advantage.

Third, seafood exporters need to have a clear understanding of rules of origin, standards, and trade barriers such as regulations on Sanitary and Phytosanitary - SPS and Technical Barriers to Trade - TBT. Once the regulations and standards are met, Japanese consumers will trust Vietnamese seafood products. That contributes to helping Vietnam improve its comparative advantage in seafood exports.◆

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Summary

Bài viết nhằm nghiên cứu lợi thế so sánh của các mặt hàng thủy sản xuất khẩu Việt Nam sang thị trường Nhật Bản. Trong quá trình nghiên cứu, nhóm tác giả đã phân tích lợi thế so sánh của các mặt hàng thủy sản Việt Nam xuất khẩu sang thị trường Nhật Bản thông qua các chỉ số về lợi thế so sánh gồm các chỉ số: chỉ số so sánh RCA, chỉ số định hướng khu vực RO trong giai đoạn 2011-2020. Qua nghiên cứu, các nhóm hàng có mã HS0304, HS0306 và HS1605 là những nhóm hàng có lợi thế so sánh cao. Các nhóm hàng khác Việt Nam đang dần mất đi lợi thế so sánh. Bên cạnh đó, nhóm tác giả so sánh với Trung Quốc và Na Uy là hai quốc gia xuất khẩu lớn thủy sản sang Nhật Bản. Từ kết quả nghiên cứu, nhóm tác giả đề xuất một số giải pháp nâng cao lợi thế so sánh cho nhóm hàng có lợi thế so sánh cao và nhóm hàng có lợi thế so sánh thấp hay chưa có lợi thế so sánh, phát triển chuỗi cung ứng thủy sản xuất khẩu.