RELATIONSHIP BETWEEN SEAFOOD EXPORT AND VIETNAM'S ECONOMIC GROWTH IN THE PERIOD OF 2005 – 2022

By

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ABSTRACT:

This article studies the relationship between seafood exports and Vietnam's economic growth in the period 2005 - 2022. To conduct the research, the authors collected data on seafood export turnover and economic growth rate - represented by real gross domestic product (GDPr) in the period from 2005 to 2022. Data is collected from the General Statistics Office of Vietnam (GSO) and international financial statistics sites (IFS, IMF). After synthesizing and cleaning the data, the research team used Eviews 8 software to analyze the data series to examine the relationship between seafood export turnover and economic growth during the research period. Model results show that when seafood export turnover increases by 1%, economic growth increases by 1.041382%, so it can be confirmed that seafood export has a positive relationship with Vietnam's economic growth during the research period. From the research results, the authors have several proposals to promote the growth of Vietnamese seafood exports to the international market in the post-pandemic context and the volatile world seafood market situation.

KEYWORDS:

Seafood export, economic growth, Vietnam, 2005 – 2022.

1. Raising the issues

In recent years, Vietnam's fisheries industry has enjoyed favorable conditions to boost production and export, achieving many impressive results. From 2011 to 2020, the fisheries industry made remarkable progress. According to statistics from the Vietnam Association of Seafood Exporters and Producers (VASEP), in 2019, the growth rate of seafood production value reached 6.25% compared to the whole of 2018. Total output in 2019 reached about 8.15 million tons, an increase of 4.9%, including mining output of 3.77 million tons, an increase of 4.5% over the same period last year. Aquaculture reached 4.38 million tons, up 5.2% compared to 2018 [6].This creates great conditions for the seafood export process in our country. Seafood export plays an important role in Vietnam's economy. The fisheries industry is one of the industries that contributes greatly to the country's GDP, is an input material for processing industries, and provides jobs for millions of people. As one of the country's key industries, fisheries contribute significant potential to the Vietnamese economy as well as global logistics services. Realizing the importance of seafood exports to Vietnam's economic growth, the research team performed an analysis of *"The relationship between seafood exports and Vietnam's economic growth in the period 2005 - 2022"*. In the article, the research team collected data on seafood exports (X), real gross domestic product (GDPR), and Vietnam's economic growth in the period 2005-2022. Data was collected from the General Statistics Office of Vietnam (GSO) and international financial statistics sites (IFS, IMF), with data collected by the research team analyzed using Eview8 software. The research team built a log-log linear regression model to show the relationship between seafood exports (X) and Vietnam's economic growth in the period 2005 - 2022. From the results of collecting secondary information, assessments of the role of seafood exports in Vietnam's economic growth, and quantitative analysis results, the research team offers some recommendations to promote seafood exports, contributing to Vietnam's economic growth.

2. The role of seafood export in Vietnam's economic growth

According to the Ministry of Agriculture and Rural Development, the fisheries industry plays an important role in the country's economic development. The scale is increasingly expanding and the role is also constantly increasing in the national economy, becoming one of the key economic sectors, achieving high growth rates; large scale, and production value; There are many export products with turnover of over 1 billion USD. In 2019, seafood products were exported to 158 countries and territories, including important markets such as the EU, Japan, the USA, Korea, and Russia. With outstanding efforts of the fisheries industry and fishermen, Vietnam has become one of the three largest seafood exporting countries in the world, playing a leading role in providing global seafood. Results after 10 years of implementing the fisheries development strategy to 2020, in the period 2010-2019, the GDP structure of the fisheries sector in the entire agricultural sector increased from 17.8% to 24.4%. Aquatic production increased from 5.1 million tons to 8.2 million tons. Seafood export turnover increased from 5.0 billion USD to 8.6 billion USD, equivalent to 1.7% of the total export value of the country and 20.8% of agricultural export turnover. Fisheries create jobs for about 3.9 million workers, contributing to the restructuring of the agricultural and rural economy [4].

Vietnam is considered an ideal and potential country for the seafood industry, including both aquaculture and exploitation sectors. Vietnam's seafood processing system is extremely diverse, thanks to the advantages of nature and geographical location. Vietnam is divided into three fishing regions: the North, the Central, and the South. Each region possesses a different and unique strength for each type of seafood. In particular, the Northern region mainly exploits aquatic species that live in freshwater and are raised in cages at sea; The Central region focuses on intensive aquaculture and

fishing of shrimp such as tiger prawns, lobsters, and cage fish aquaculture; The southern region is considered the center of the seafood sector, with diverse aquaculture activities such as pangasius, snakehead fish, perch, giant freshwater prawns and many other types of seafood. The main aquaculture industries of our country are pangasius and shrimp. According to research by the Vietnam Association of Seafood Exporters and Producers (VASEP)[2],this aquaculture activity is often concentrated in the Mekong Delta, accounting for 95% of the total pangasius production and 80% of the country's shrimp production.Between 1995 and 2020, Vietnam's aquaculture output increased 11-fold and grew at an average annual rate of 10%. Along with that, according to statistics, the whole country has 2,362 brackish water shrimp seed production establishments, including 1,750 black tiger shrimp production establishments and 612 whiteleg shrimp production establishments. In addition, the Mekong Delta region alone has about 120 pangasius broodstock production establishments and nearly 4,000 hectares of pangasius nurseries; producing about 2 billion pangasius fingerlings.

Regarding the exploitation and fishing sector, according to VASEP statistics, in 2020, the whole country had 94,572 fishing vessels. Of these, the number of fishing vessels from 6 meters to 12 meters long is 45,950 fishing vessels, 18,425 vessels from 12 meters to 15 meters long, 27,575 vessels from 15 meters to 24 meters long, and 2,662 vessels longer than 24 meters. In addition, the whole country has 4,227 operating teams with 29,588 fishing vessels and 179,601 workers at sea. Vietnam's fisheries industry has opportunities and receives long-term orientation, receiving attention from the State because this is one of the industries that brings economic benefit to the country. The evidence is that Decision No. 1445/QD-TTg issued on August 16, 2013, set out perspectives on fisheries development planning by the national socio-economic development strategy and goals. The development is that the Fisheries industry will be industrialized by 2020, modernized by 2030, and continue to develop comprehensively, effectively, and sustainably. In addition, with the above data on aquaculture and exploitation, the seafood supply chain can supply large volumes and ensure safety in terms of quality. Along with that, the technology used in the seafood industry will gradually be improved and when modern technology is applied to the industry, seafood products can be diversified. Vietnam also has a highly skilled, experienced, and stable human resource, along with participating in signing trade liberalization agreements such as EVFTA, and UKVFTA and advantages in import and export taxes. Exports will help the seafood industry promote exports. Vietnam is in the process of strengthening and developing, helping the country's fisheries industry become a key economic sector and lay the foundation for the long term [8].

Although seafood export in particular and the seafood industry in general play an important role in many sectors of the economy. However, there are not many research articles pointing out the relationship between seafood export turnover and economic growth. Most of the articles only mention the general role of seafood export, with very few qualitative and quantitative research articles on this issue. Therefore, in the article, the research team clarifies the quantitative relationship between seafood export turnover and Vietnam's economic growth during the research period.

3. Research methodology
Data collection methods

Based on considering the role of seafood exports in Vietnam's economic growth in the period 2005 - 2022, the research team collected data on seafood exports (XM), actual gross domestic product (XM), and real gross domestic product (GDPR) – variables representing economic growth. Data are collected by year for the period from 2005-2022 in Vietnam on the website of the General Statistics

Office, and the international financial data site IFS-IMF, as well as from reports and analyses on the magazines and media.

The research team analyzed secondary data collected using Excel and Eviews8 software.In the model, the variables XM and GDPR are logged and denoted as LXM and LGDPR. With the collected and logged variables. The results of data analysis will contribute to determining the relationship between seafood exports and Vietnam's economic growth in the period 2005-2022, to gain more evidence about the role of seafood exports in economic growth in Vietnam.

From the collected secondary data, the research team processed, created tables and drew graphs to compare and analyze, thereby answering the research questions and clarifying the goals set out in the article.

Analyze the relationship of seafood exports (XM) and Vietnam's economic growth

LGDPR = C(1)*LXM + C(2) + e

GDPR: real gross domestic product

XM: export value of the seafood industry

e is random noise

C(1), C(2) are the coefficients

The procedure is taken as follows:

Step 1: Use Eviews 8 software to run the model with collected secondary data.

Step 2: Check the statistical significance of the regression coefficients with the explanatory variables and the statistical significance of the regression model with significance level α=0.05.

A regression coefficient is statistically significant if:

- Prob < α=0.05

- Prob(F-statistic) < α=0.05

Step 3: Check the explainability of the model through the coefficients R–squared and Adjusted R–squared

A model is explanatory (fit) if:

- R–squared > 0.6

- Adjusted R–squared > 0.6

Step 4: Check the model's defects with α=0.05.

A model is good (*can be used for analysis*) when the regression coefficients in the model are statistically significant, and the R–R-squared, Adjusted R–squared should not have autocorrelation and heteroskedasticity. At the same time, the residuals of the model should follow the standard normal distribution.

In the study, the authors used tools on Eviews 8 to check for these defects. Specifically:

- Breusch-Godfrey test to check autocorrelation. The model does not have an autocorrelation defect at some level p if Prob (F-statistic) and Prob (Obs *R-squared) > α=0.05.
- Breusch-Pagan-Godfrey to test heteroskedasticity. The model is not subject to heteroskedasticity if Prob (F-statistic) and Prob (Obs*Chi-squared) > α=0.05.
- Jarque-Bera to check if the residuals of the model follow the standard normal distribution. The residuals of the model are normally distributed if Prob (Jarque - Bera) > 0.05.

When the above conditions are satisfied, the model results are estimated and analyzed.

4. The relationship between seafood exports and Vietnam's economic growth in the period 2005 - 2022: Analysis from a quantitative perspective

4.1. Analytical data

With the collected data, through Eview8 software, the research team performed descriptive statistics on the data in Table 1, and with Excel software, the data are shown in Figure.

Table 1. Descriptive statistics of variables

	LGDPR	LXM
Mean	21.87576	8.721732
Median	21.93208	8.799422
Maximum	22.43629	9.298663
Minimum	21.18615	7.912972
Std. Dev.	0.41147	0.384312
Skewness	-0.35149	-0.58714
Kurtosis	1.801403	2.354289
Jarque-Bera	1.448111	1.346914
Probability	0.484782	0.509943
Sum	393.7638	156.9912
Sum Sq. Dev.	2.87823	2.510831
Observations	18	18

Source: Results of data analysis using eview8 software

Figure 1. Vietnam's seafood exports and real gross domestic product (GDPR) in the period 2005-2022

Unit: VND billion, USD million
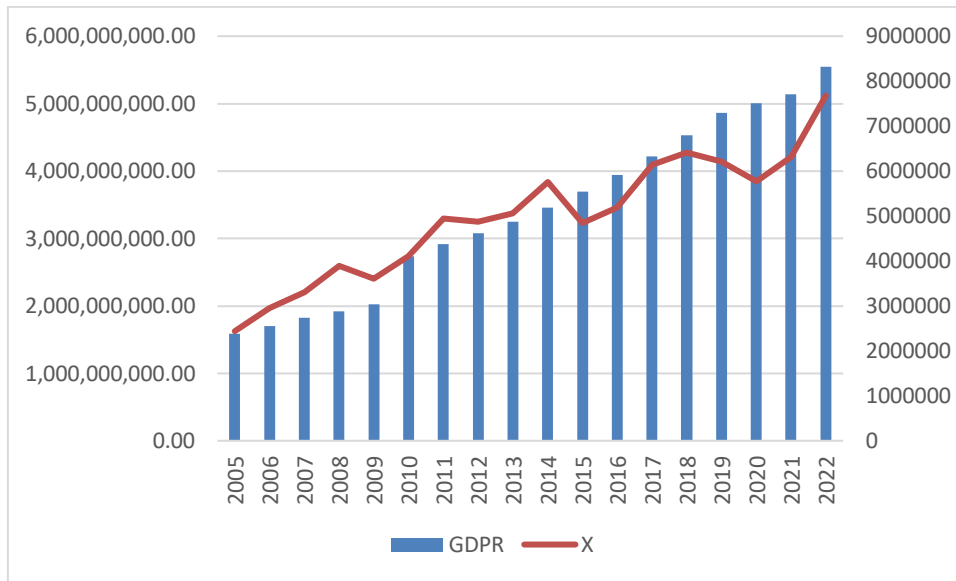
Source: Compiled from the General Statistics Office [7], International Financial Statistics[3]

Data have shown that in the period 2005 - 2022, Vietnam's seafood exports fluctuated, but in general showed an increasing trend. The average growth rate over the period is about 7.57% over the years. In the period 2005 - 2008, seafood export turnover increased from 2437635 million USD to 3888662 million USD, an average increase of 16.9%. However, entering 2009, export turnover decreased by 7.13%, the reason being that major economies - Vietnam's main seafood export markets - were heavily affected by the financial and economic crisis. Besides, it also suffers from unfair competition from export enterprises, unstable raw material sources, and unfavorable exploitation situations...In the period 2010 - 2014, import turnover tended to increase over the years, except for 2012 where there was a slight decrease (1.4% compared to 2011). Entering 2015, due to technical and trade barriers introduced by partner countries, especially the increased anti-dumping tax on pangasius in the US market, causing difficulties for businesses, besides, fluctuations of USD, Yen, and Euro have a significant impact on the export activities of seafood enterprises. In the period 2016 - 2022, seafood export turnover is at a positive growth rate and tends to increase strongly after 2020. The cause of the decline in export turnover in the period 2019 - 2020 is due to the Vietnamese economy and the global economy in general being negatively impacted by the Covid-19 pandemic, however, Vietnam's seafood exports have quickly recovered and grown in the period 2021 - 2022. The period 2005 - 2022 shows a steady increase in economic growth over the years, with an average growth rate of 7.82%. As one of the economies that still achieved positive growth even in the context of COVID-19, in 2020 and 2021, growth rates of 2.87% and 2.56% (preliminary data), and estimates for 2022 are 8.02% [1].

4.2. Results of quantitative analysis of the relationship between seafood exports and Vietnam's real gross domestic product in the period 2005-2022

With data collected on seafood exports and Vietnam's actual gross domestic product in the period 2005-2022, the research team conducted model estimates using Eview 8 software, the estimated results are shown in Table 2.

Table 2. Results of estimating the relationship between seafood exports and Vietnam's real gross domestic product in the period 2005 – 2022

Dependent Variable: LGDPR

Method: Least Squares

Date: 10/25/23   Time: 16:19

Sample: 2005 2022

Included observations: 18

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LXM	1.041382	0.062174	16.74958	0.0000
C	12.79311	0.542759	23.57053	0.0000

R-squared	0.946046	Mean dependent var	21.87576
Adjusted R-squared	0.942674	S.D. dependent var	0.411470
S.E. of regression	0.098518	Akaike info criterion	-1.692719
Sum squared resid	0.155292	Schwarz criterion	-1.593789
Log-likelihood	17.23447	Hannan-Quinn criteria.	-1.679078
F-statistic	280.5485	Durbin-Watson stat	1.391647
Prob(F-statistic)	0.000000		

Source: Model estimation results

Check model fit

The results in Table 2 show that all regression coefficients are statistically significant because Prob coefficient (LXM) = 0.0000 < 0.05; Prob (C) = 0.0000 < 0.05. The regression model is suitable because the coefficient Prob (F-statistic) = 0.000000 < 0.05

The coefficient of determination of the model R-squared = 0.946046 > 0.6; Adjusted R- R-squared = 0.942674 > 0.6.

Autocorrelation test

Table 3. Autocorrelation defect test

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.904938	Prob. F(2,14)	0.4270
Obs*R-squared	2.060595	Prob. Chi-Square(2)	0.3569

Source: Model testing results

According to Table 3, Prob. $F_{(2,14)}$ = 0.4270 > 0.05; Prob. Chi-Square(2) = 0.3569 > 0.05. The no-disability model is autocorrelated (with a significance level of 5%).

Test for heteroskedasticity

Table 4. Heteroskedasticity defect test

Heteroskedasticity Test: White

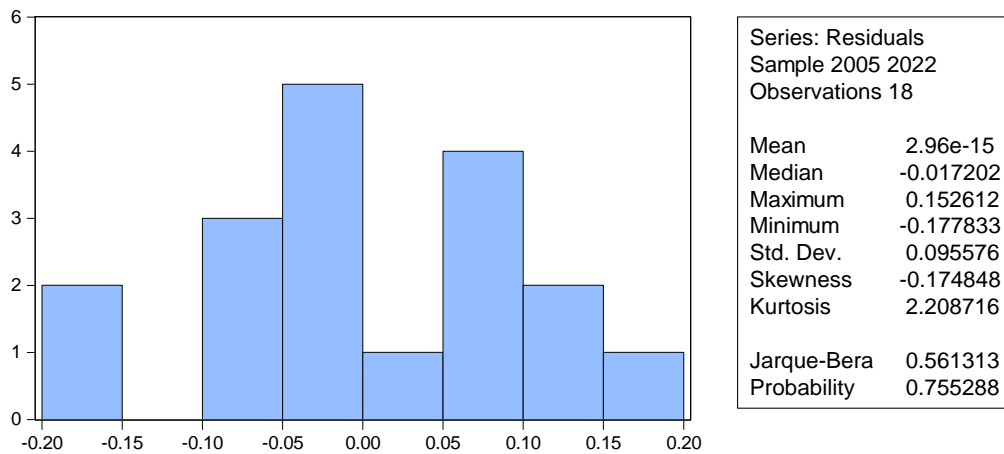|			
F-statistic	0.256409	Prob. F(2,15)	0.7771
Obs*R-squared	0.595040	Prob. Chi-Square(2)	0.7427
Scaled explained SS	0.284142	Prob. Chi-Square(2)	0.8676

Source: Model testing results

According to Table 4, Prob. F(2,15)=0.7771 > 0.05; Prob. Chi-Square(2) = 0.7427 > 0.05; Prob. Chi-Square(2) = 0.8676 > 0.05. The model does not have heteroskedasticity.

Test for normally distributed residuals

The residual of the model follows a normal distribution Prob (Jarque – Bera) = 0.755288 > 0.05 (According to Figure 2)

Figure 2. Normally distributed residuals

Series: Residuals	
Sample 2005 2022	
Observations 18	
Mean	2.96e-15
Median	-0.017202
Maximum	0.152612
Minimum	-0.177833
Std. Dev.	0.095576
Skewness	-0.174848
Kurtosis	2.208716
Jarque-Bera	0.561313
Probability	0.755288

Source: Model testing results

Regression model and analysis of model results

The results of regression data analysis using Eviews 8 software in Table 2 have shown the relationship between seafood exports and Vietnam's economic growth in the period 2005-2022, the log - log-linear regression model is as follows:

LGDPR = 1.0413828*LXM + 12.79311

The results of the regression model have shown that:

Seafood exports have a positive correlation with Vietnam's real gross domestic product. Specifically, coefficient C(1) = 1.0413828 > 0, This shows that, under the condition that other factors remain unchanged, when seafood exports increase, real total domestic product increases. When seafood exports increase by 1%, the total real domestic product increases by 1.0413828%. Thus, textile and garment exports also contribute to promoting economic growth, this is an industry that plays an important role in the Vietnamese economy with a strategy to promote exports. Developing and increasing exports of the seafood industry helps Vietnam take advantage of human resources, create jobs, increase income for workers, improve living standards for workers, and ensure social security.

The significance of the R-squared coefficient = 0.946046 shows that the regression model explains 94.6046% of the fluctuations in Vietnam's economic growth in the period 2005-2022.

5. Solutions to promote Vietnam's seafood exports

Vietnam's seafood export plays an important role in promoting economic growth. Besides the potential and advantages, Vietnam's seafood exports in the period 2005 - 2022 also face many difficulties from partners, including regulations on technical barriers that partners set for Vietnamese seafood. In particular, the period during and after COVID-19 is a challenging time for Vietnamese seafood export enterprises. To overcome limitations, overcome difficulties, and seize opportunities, the research team proposes some solutions to promote Vietnam's seafood exports as follows:

On the part of enterprises that cultivate, process, and export aquatic products
First, it is necessary to increase the diversification of processed seafood products. In addition to the traditional products of shrimp and fish, more attention should be paid to other products, such as oysters, scallops, cuttlefish, squid, octopus, abalone, and snails... to meet diverse consumer needs.
Second, For aquaculture and processing enterprises, it is necessary to increase the application of modern science and technology in the production and processing process to improve the output, value, and quality of aquatic products, thereby meeting the demand of consumers and non-tariff and quarantine barriers from partner countries.
Third, For export businesses, it is necessary to focus on promoting market research of partner countries on market structure, and consumer tastes, and identifying current and potential competitors through close connection with the Government, thereby accessing reputable information channels. Promote the development of policies and methods of promotion and communication such as organizing Vietnamese agricultural product fairs at international pavilions, and building national brands for Vietnamese aquatic products. Besides, export businesses also need to make the most of the tariff benefits that FTAs bring.
Fourth, there needs to be a close connection between aquaculture, processing, and export enterprises. Aquaculture households need to ensure input supplies for processing and export enterprises. The issue of commitment in business needs to be focused on and promoted; on the contrary, export and processing enterprises need to comply with business contracts, avoiding price pressure on aquaculture households. In addition, there needs to be close cooperation between businesses to avoid unfair competition…

On the part of the State and management agencies
First, actively building trade promotion programs to support seafood businesses in accessing international markets and understanding the needs, tastes, regulations, and trade restrictions in markets: the United States, China, Japan, Korea, Thailand, Philippines, Russia, and the EU, to which Vietnamese enterprises can boost exports in the near future.

Second, promote the transfer and application of science and technology into production to create aquatic products with scientific content, high added value, convenience, and beautiful packaging designs, suitable for each market's tastes. Use aquatic raw materials economically and effectively. Focus on key subjects, seafood, especially pangasius, because currently, it is still mainly frozen fillet products.

Third, the state needs to have legal frameworks and policies to support exporters, processors, and aquaculture households such as tax reduction. Strengthen propaganda and mobilization of aquaculture households about environmental protection. Apply policies to protect growers if price gouging by traders occurs, or protect businesses from unfair competition…

Fourth, local management agencies need to promote the planning of raw aquaculture areas. Localities need to urgently review planning for intensive and super-intensive shrimp aquaculture, especially concentrated aquaculture, to consider adjusting and supplementing planning to suit natural conditions and the actual situation to avoid unplanned aquaculture development. Promote production organization in the direction of chain linkage from supply of production input materials to product consumption; Regularly review the situation of linked activities to promptly detect and support the removal of difficulties and obstacles, improve operational efficiency, and perfect value chain linkage models in shrimp aquaculture for replication.

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