International Journal of Innovative Research and Scientific Studies, 6(1) 2023, pages: 72-79

IJIRSS
International Journal of Innovative Research & Scientific Studies

ISSN: 2617-6548

URL: www.ijirss.com

Assessing the impacts of non-tariff measures on the export of Vietnam's main agricultural and seafood products

Le Thi Viet Nga[1], Doan Nguyen Minh[2], Phan The Cong[3*]

[1,2,3]*Thuongmai University, Hanoi, Vietnam.*

*Corresponding author: Phan The Cong (*Email: congpt@tmu.edu.vn*)

Abstract

With the development of free trade agreements, tariff barriers are gradually removed, and non-tariff measures are playing an important role in the trade policies of countries. However, studies on the effects of non-tariff measures on trade show a great disparity in results and both negative and positive influences can be found when non-tariff measures are imposed in different contexts. The heterogeneity in the result is often hypothesized to be the consequence of intrinsic characteristics related to products and countries; therefore, arguably, unbiased and reliable estimation of non-tariff measure effect on trade should be analyzed in product level data for a specific country. Hence, the study attempts to use the gravity model and Poisson Pseudo-Maximum Likelihood estimation (PPML) to quantify the effects of non-tariff measures on the export of some agricultural and seafood products of Vietnam to certain main markets including the United States (US), European Union (EU), China, and Japan. The research findings show that from a national perspective, non-tariff measures mostly have a negative impact on agricultural exports, especially sanitary and phytosanitary measures (SPM), and countervailing measures (CM). In terms of commodities, coffee and seafood are particularly sensitive to non-tariff measures, while other key agricultural product groups are mostly affected by tariff measures.

Keywords: Agricultural products, Gravity models, Non-tariff, PPML estimation, Product-level data, Vietnam's export.

DOI: 10.53894/ijirss.v6i1.1090
Funding: This study received no specific financial support.
History: Received: 10 October 2022/**Revised:** 25 November 2022/**Accepted:** 15 December 2022/**Published:** 20 December 2022

Authors' Contributions: All authors contributed equally to the conception and design of the study.
Competing Interests: The authors declare that they have no competing interests.
Transparency: The authors confirm that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained.
Ethical Statement: This study followed all ethical practices during writing.
Publisher: Innovative Research Publishing

1. Introduction

Vietnam is a country with advantages in exporting agricultural and seafood products. Currently, Vietnam ranks 15th in export turnover of agricultural products among the world's agricultural product exporters and her agricultural products are exported to more than 180 countries and territories. In particular, Vietnam's agricultural products have gradually appeared in markets with stricter standards such as the EU, the United States, Japan, etc. Leading in total export turnover of agricultural and seafood products of Vietnam in 2021 is the Asia market with a value of 15.4 billion USD (China market

reached 7.55 billion USD, Association of South East Asian Nations' members reached 2.89 billion USD, Japan reached 1.8 billion USD); The Americas is the second largest market with a total export turnover of Vietnam's agricultural and seafood products reaching 4.67 billion USD (of which the United States alone reached 3.92 billion USD); European countries reached 4.4 billion USD (the EU market alone reached 3.2 billion USD); Africa reached 936 million USD, and Oceania reached 557 million USD [1]. Since 2018, the Ministry of Agriculture and Rural Development has listed 13 key agricultural export products of the country, including rice, coffee, rubber, pepper, cashew nuts, tea, vegetables, fruits, cassava and cassava products, pork, poultry meat and eggs, pangasius, shrimp, wood and wood products. In recent years, Vietnam's export turnover of agricultural and seafood products has continuously increased, from $22 billion in 2016 to $28.04 billion in 2021, contributing to the total turnover. Vietnam's key export agricultural products include rice, coffee, vegetables, and seafood with an export turnover of over 2 billion USD per year [2].

Market access conditions for Vietnam's agricultural and seafood products have become more favorable in the context of increasingly liberalized trade through free trade agreements between Vietnam and countries around the world, such as the European-Vietnam free trade agreement - EVFTA, Comprehensive and Progressive Agreement for Trans-Pacific Partnerships - CPTPP, ASEAN Free Trade Agreement – AFTA. Accordingly, tariffs on agricultural and seafood products exported from Vietnam to the EU (under EVFTA) and members of CPTPP and RCEP (Regional Comprehensive Economic Partnership) will be deeply reduced immediately after the Agreement comes into force or 3-7 years after the Agreement comes into force, non-tariff measures are also adjusted in the direction of increasing transparency, removing unnecessary barriers with the aim of ensuring free, fair and efficient trade in agricultural products. However, the export of agricultural products from Vietnam to other countries, currently, still faces many obstacles due to the appearance of non-tariff measures, typically technical and sanitary measures that are put in place with the goal of protecting the health and safety of people, animal/plant life and the environment.

Therefore, research on the impact of non-tariff measures on the export of agricultural and seafood products from Vietnam is essential to have a basis for proposing solutions to cope with the regulations of importing countries, especially in response to the non-tariff measures of these markets. The article aims to study the impact of non-tariff measures of some main importing countries (China, the EU, the USA, and Japan) on some key export agricultural products of Vietnam (rice, coffee, vegetables, fruits, and seafood) by using the gravity model, thereby proposing some solutions to boost Vietnam's agricultural and seafood product exports in the near future.

The paper is structured as follows: the next section presents a concise discussion of the existing literature related to the effect of non-tariff measures on export. Next, the paper discusses the method of data collection and estimation, and then the estimated results are categorized by products and markets. Finally, appropriate countermeasures are derived to overcome the negative impact stemming from non-tariff measures and to continue to promote the volume of agricultural and seafood trade.

2. Overview of Non-Tariff Measures and Impacts of Non-Tariff Measures on Exported Agricultural and Seafood Products

Non-tariff measures, in general, are understood as all measures with a legal value other than ordinary tariffs, which can have an economic effect on trade in goods, limiting the quantity or the value of goods or both [3]. Non-tariff measures can be used for different purposes such as protection of national security; protection of the health and safety of people, animal and plant life; environmental protection; protection of the domestic manufacturing industry; regulation of the export and import activities, and ensuring fair competition. However, many studies show that non-tariff measures have both positive and negative effects on exports in general and exports of agricultural products in particular. Research by Yalcin, et al. [4] reveals significant trade-restrictive effects from non-tariff measures. Specifically, research also points out the disparity in requirements levels between developing and developed countries; which tend to become challenging barriers for agricultural trade. Non-tariff measures are also used as trade protectionist tools, with trade-restrictive effects, including subsidies, [5]. Overall trade can be reduced by 12% and agricultural trade can be reduced by approximately 8.42% as the direct result of non-tariff measures. Surprisingly, subsidy measures show the least negative effect on trade, only reducing trade by around 10%. UNCTAD data suggest that 97% of agricultural product lines face non-tariff measures. Agricultural products imported into the Japanese market or 98% of agricultural products imported into the EU or 100% of agricultural products imported into the United States and China are all affected by non-tariff measures.

Some other studies use the gravity model to assess the impact of non-tariff measures, typically technical and sanitary measures, on agricultural exports. Dou, et al. [6] used a quantitative research method based on the gravity model to evaluate the influence of food safety standards on Chinese fruit and vegetable exports. According to the results of the study, the food safety standards, especially the pesticide regulations of the importing country, had a significant impact on China's exported fruit and vegetables. On the other hand, China's food safety standards also have a strong impact on the country's fruit and vegetable exports. If China uses the same food safety standards as importing countries, it will reduce fruit and vegetable exports. A study conducted by Ling suggests that standards related to the limitation of pesticide residue in Japan, the US, and the EU have a negative effect on the overall trade flow of fruit products. Specifically, the standards reduce fruit trade by 4.16%. However, the study fails to record this impact in the long run suggesting that the standards encourage trade in the long run. Exports are increased, and the quality and competitiveness of products are improved. Similarly, Wood, et al. [7] studied the effects of SPM measures on the export of agricultural products from some countries (New Zealand, the United States, Korea, and Japan) to the Chinese market by the gravity model and found that China's SPM measures have a negative, but not significant, effect on agricultural products exported to the Chinese market. In particular in each country, while China's SPM measures have a negative impact, restricting agricultural exports from Japan and the United States,

these measures have a positive impact, boosting the export of agricultural products from Korea and New Zealand. However, New Zealand's agricultural exports to China since the Free Trade Agreement - FTA between the two countries took effect have been negatively impacted by China's SPM measures.

Gravity models are also used to assess the impact of non-tariff measures on seafood exports. A study by Baylis, et al. [8] shows that although free trade agreements have the effect of reducing tariffs and promoting the growth of seafood exports, non-tariff measures reduce the export turnover of these commodities by 25%. Another study by Nguyen and Wilson [9] also used the gravity model and panel data, fixed effect method to assess the impact of food hygiene and safety standards on seafood exports to three main regions (the United States, Europe, and Japan). The results of the study show that sanitary and phytosanitary measures have different effects on different seafood categories; while shrimp products are more sensitive to changes in food safety policy, fish products are not affected too much. When the United States applied Hazzard Analysis and Critical Control Point System - HACCPS, the EU applied the Minimum Required Performance Limit (MRPL) and Japan applied the Basic Food Safety Law, shrimp export turnover to these markets decreased by 90.45%, 99.47%, and 99.97% respectively while fish-related categories decreased by 66.71%, 82.83%, and 89.32%.

Thus, in order to protect human health and safety, animal and plant life, the environment, etc., it seems that over 90% of agricultural products imported into countries are controlled and affected by non-tariff measures. Studies using gravity models also show that non-tariff measures, notably technical and sanitary, and phytosanitary measures, may limit agricultural exports in the short term and may promote the export of agricultural products in the long run. However, it can be affirmed that up to this point, there have been no studies using gravity models to assess the impact of non-tariff measures in some major importing countries on Vietnam's export of some main agricultural products. Therefore, this article is considered a novel and meaningful study to fill that research gap.

3. Research Method and Data

3.1. Research Method

The article uses qualitative research methods in analyzing and describing the current situation of Vietnam's agricultural and seafood exports in the 2016-2021 period.

Besides, with the aim of assessing the impact of non-tariff measures on Vietnam's agricultural exports to major markets, the authors choose to use the structural gravity model. Specifically, the research model in the article will be in the form of a linear log as follows:

$$Ln\, X_{VN,j;t} = lnGDP_{j,t} + lnGDP_{VN,t} + (1 - \sigma)lnt_{VN,j;t} - (1 - \sigma)ln\Pi_{VN,t} - (1 - \sigma)lnP_{j,t} + \varepsilon_{VNj,t}$$

Where $X_{ij,t}$ is the export turnover of agricultural products of Vietnam (country i) to the importing country (country j) in time t; $GDP_{i,t}$ and $GDP_{j,t}$ are the gross domestic product of Vietnam and its partner in time t; $\Pi\_(VN,t)$ and $P\_(j,t)$ represent the multilateral trade hindrance index of Vietnam and the importing country; $t_{VN,j;t}$ represents the cost of trade and, more specifically, in this case, the cost of Vietnam's exports to the importing countries and is expressed through the specific equation as:

$$(1- \sigma)lnt_{VN,j;t} = \beta_1 T_{VNj,t} + \beta_2\, NTM_{VNj,t}$$

$TVN_{j,t}$ is the applicable import tariff rate that country j applies to Vietnam's agricultural products to the import market during the period t; $NTM_{VNj,t}$ is a vector including non-tariff measures applied to Vietnamese agricultural products of importing country j, specifically.

$$NTM_{VNj,t} = TBT_{VNjt} + SPM_{VNj,t} + CV_{VNj,t} + QR_{VNj,t} + SG_{VNj,t} + AD_{VNj,t} + ES_{Vnj,t}$$

With TBT as technical barriers, SPM as sanitary and phytosanitary measures, CV (Countervailing) as anti-subsidy measures, QR (Quantitative Restriction) as quantitative restriction measures, SG (Safeguard) as safeguard measures, AD (Anti-dumping) are anti-dumping measures, ES (Export Subsidy) are export subsidies).

3.2. Estimation Method

The article uses the PPML estimation method to solve the inherent problems of trade data such as zero trade flow and variable variance. The PPML estimation method allows the dependent variable of the model to be in linear form. Specifically, the gravity equation under the PPML estimate will be in the form:

$$X_{VN,j;t} = lnGDP_{j,t} + lnGDP_{VN,t} + (1 - \sigma)lnt_{VN,j;t} - (1 - \sigma)ln\Pi_{VN,t} - (1 - \sigma)lnP_{j,t} + \varepsilon_{VNj,t}$$

3.3. Research Data

Data on the current situation of Vietnam's agricultural and seafood exports in the period 2016-2021 are used from the Import and Export Report published by the Ministry of Industry and Trade in the years 2016-2021. The data used in the gravity model includes the export turnover of agricultural products from Vietnam to major markets, including the United

States, Europe, China, and Japan under a 4-digit HS code for a period of 19 years from 2000 to 2019 and were collected from COMTRADE's database. The commodities studied are the main agricultural products, including vegetables (HS07, HS08), seafood products (HS03), rice (HS1006), and coffee (HS0901). Data related to Vietnam's gross domestic product - GDP and European GDP are collected from the World Development Indicators data source of the World Bank. Data on tariffs and non-tariff measures are collected from the Tariff download facility and Integrated Trade Intelligence Portal - ITIP of the World Trade Organization - WTO.

4. Research Results

4.1. Overview of the Current Situation of Vietnam's Agricultural and Seafood Product Exports

Despite slight fluctuations in the years 2017-2020, Vietnam's export turnover of agricultural and seafood products in 2021 reached a value of 28.04 billion USD, an increase of 12.16% compared to 2020 and an increase of 27. 5% compared to 2016 Table 1.

Table 1.
Export turnover of agricultural and seafood products of Vietnam by product structure in the period 2016-2021.

Unit: Billion USD

Year	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
Total export turnover of agricultural and seafood products of Vietnam	22	25.83	26.6	25.5	25	28.04
Seafood export turnover	7.05	8.32	8.8	8.54	8.41	8.88
Vegetable export turnover	2.5	3.5	3.81	3.75	3.27	3.55
Rice export turnover	2.17	2.62	3.06	2.81	3.12	3.3
Coffee export turnover	3.34	3.24	3.54	2.86	2.74	3.07

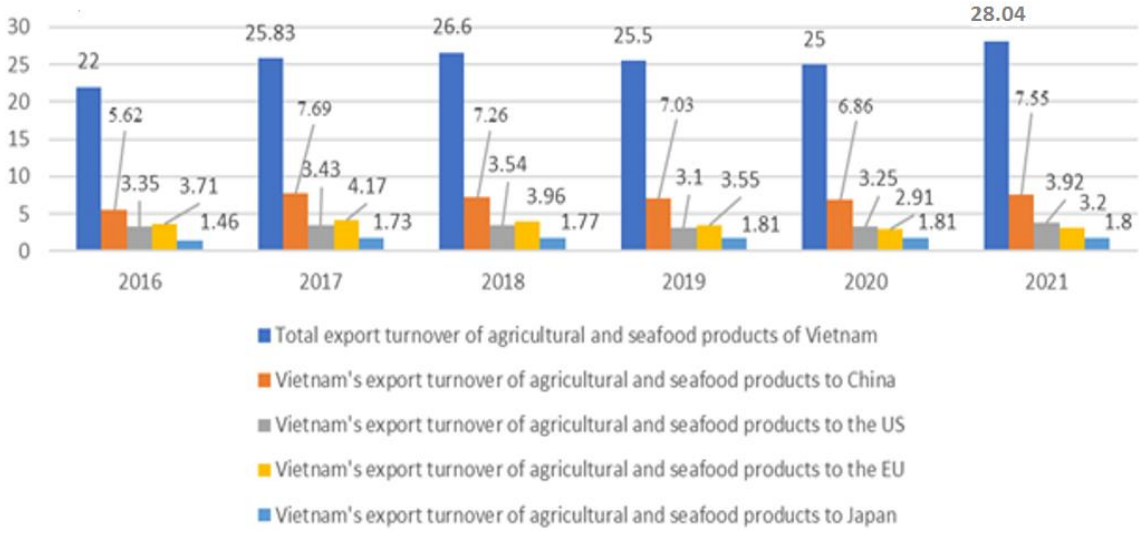
Source: Import-export report of the ministry of industry and trade for the years 2016-2021.

In terms of product structure, the turnover of seafood products accounts for the largest proportion and achieved good growth in the past 6 years, increasing from 7.05 billion USD in 2016 to 8.88 billion USD in 2021. The group of vegetables, fruits, and rice, basically, also has had export growth over the years, but the export turnover of coffee products shows signs of instability. In general, the export turnover of agricultural and seafood products in Vietnam in 2019 decreased mainly due to price fluctuations [2] and continued to decrease in 2020 due to the influence of Covid19 pandemic on a global scale [2]. In 2021, with the efforts of the Government, ministries, and businesses, the export turnover of many agricultural and seafood products of Vietnam, including rice, coffee, vegetables, fish, and shrimp quick recovery [1].

In terms of export market structure, China is currently still the leading market in terms of export turnover of Vietnam's agricultural and seafood products with a value of 7.55 billion USD in 2021 (an increase of about 10% over the previous year) 2020, an increase of 34.34% compared to 2016), ranked second in the EU market, however, In2021, the US market was the second biggest importer of Vietnam’s agricultural and seafood products at 3.92billion USD. Japan is a market for importing agricultural and seafood products from Vietnam with a value of nearly 2 billion USD per year Figure 1.

Vietnam exports to China many agricultural and seafood products, which is the leading market in terms of fruit and vegetable export turnover of Vietnam, and the second in terms of rice export turnover. In 2021, Vietnam exported 1.91 billion USD of vegetables, 978 million USD of seafood, and 128.5 million USD of coffee to China. In order to export to the Chinese market, Vietnamese agricultural and seafood product exporters must meet many regulations related to labels, traceability, food safety and hygiene, etc. From January 1, 2022, Vietnam's agricultural and seafood product exporters must strictly comply with export registration activities under Order No. 248 dated April 12, 2021, on the promulgation of "Regulations on registration" and management of foreign imported food production enterprises of the People's Republic of China" of the General Administration of Customs of China, and food safety inspection as prescribed in Order No. 249 dated April 14/ 2021 on the promulgation of "Measures for food safety management for import and export of the People's Republic of China" issued by the General Administration of Customs of China to allow goods to be exported to this market.

The EU, the US, and Japan are also markets with many strict regulations for imported agricultural and seafood products related to packaging, labeling, traceability, SPM measures, anti-dumping measures, labor, and environmental regulations, etc. For example, the US Food and drug administration - FDA stipulates a list of 11 antibiotics that are prohibited from being used in the aquaculture process; all fruits imported into the US market must be irradiated in the export market; or EU, Japan all have specific regulations on the list of banned chemicals, specifying maximum residue limits (MRLs), or EU regulations on environmental protection and natural resources for seafood products. In addition, in many international markets today, there is a tendency to consume organic products, health-friendly products, and environment-friendly products as well.



(Billion USD)

Figure 1.
Export turnover of main agricultural and seafood products of Vietnam to main markets.

In general, Vietnam's agricultural and seafood product exports have tended to grow well in recent years and continue to maintain growth in the post-COVID-19 context. The export turnover of Vietnam's agricultural and seafood products to a number of main markets such as China, the EU, the US, and Japan has remained relatively stable in recent years. However, Vietnamese exporters often face many non-tariff measures, notably TBT and SPM regulations from those import markets. In the next content, the article will clarify the impact of non-tariff measures of some markets on a number of agricultural and seafood product exports of Vietnam in two aspects: by market and by market. items.

Table 2.
Shows the results of estimating the impact of non-tariff measures on agricultural exports using hierarchical data by market.

Variables	EU (1)	The US (2)	China (3)	Japan (4)
$lnGDP_{VN}$	4.35 (0.166)	0.729 (0.968)	19.68 (0.018)	3.90 (0.452)
$lnGDP_j$	0.166 (0.847)	10.78 (0.830)	15.88 (0.018)	-0.830 (0.971)
Ln(1+Tariff)	-14.2 (0.000)	-0.353 (0.000)	-0.037 (0.017)	-12.9 (0.000)
TBT	-0.009 (0.871)	-0.007 0.336	-0.082 0.004	0.0087 0.951
SPM	-0.298 (0.000)	-0.042 (0.127)	-0.305 (0.000)	-0.016 (0.000)
CV	-0.666 (0.000)	-1.603 0.000		
QR	-0.3290 (0.124)	0.008 (0.895)		-0.002 (0.975)

Note: GDPs are variable presenting the gross domestic product of Vietnam and the importing countries; TBT proxies for the number of technical barriers to trade measures imposed on Vietnam products; SPM proxies for the number of Sanitary and Phytosanitary Measures imposed on Vietnam products; CV and QR proxies for the number of countervailing measure and quantitative restriction imposed on Vietnam products respectively.

4.2. Impact of Non-Tariff Measures of Some Markets on Some Agricultural and Seafood Products for Export of Vietnam

Table 2 shows the estimation results using market-specific data. In general, it can be seen that the size of the Vietnamese and foreign markets does not really affect Vietnam's agricultural exports. In terms of tariff measures, the tariffs of all countries have a negative impact on Vietnam's agricultural exports to markets, but the degree of influence is different. Tariff barriers in the EU and Japan have a stronger negative effect than that in the US and China, showing the difference in tariff levels of these markets.

In terms of the impact of non-tariff measures, the parameter related to European Union data shows the opposite effect of these barriers on the export turnover of Vietnamese agricultural products to the EU market. Specifically, on average, if the EU applies one more SPM measure, Vietnam's export turnover will decrease by 29.8%. The results show the rigor of the SPM measures applied by the EU to Vietnam's agricultural exports. Vietnam's agricultural products have not met the sanitary and phytosanitary requirements in the European market, and it is difficult for Vietnamese enterprises to adapt to

the sanitary and phytosanitary regulations in the EU market. Meanwhile, the results of the variable related to anti-subsidy (CV) show that, on average, if the EU applies one more countervailing measure, Vietnam's agricultural export turnover will decrease by 66%. This level of influence shows that the countervailing measures applied to Vietnam's agricultural products in the EU market are relatively high, so when the EU increases a countervailing measure, the export turnover of agricultural products will be seriously affected. In addition, quantitative measures have similar results, on average, if the number of QR measures increases to 1, Vietnam's export turnover will decrease by 32%.

Considering the US market results, Non-Tariff Measure Variations show that most non-tariff measures including TBT, SPM, and quantity restriction (QR) have no impact on export turnover. Vietnamese agricultural products to the US market, the parameters of these variables are not statistically significant. From that, the US TBT and SPM measures applied to agricultural products are not intended to restrict trade but are purely to ensure quality and sanitary and phytosanitary issues for imported goods consumed domestically. Another explanation may be that Vietnam's agricultural products exported to the US market have quality in accordance with regulations on technical barriers and sanitary and phytosanitary measures. However, the results of the variable related to countervailing measure (CV) show that, on average, if the United States applies one more countervailing measure, Vietnam's agricultural exports to this market will decrease by16%. This result once again affects the impact of countervailing measures on the trade turnover of agricultural products in Vietnam.

Considering the results of the Chinese market, the non-tariff measures adopted by China also have a significant effect on agricultural trade between the two countries. The results show that, on average, if China applies one more TBT measure, Vietnam's export turnover will decrease by 0.082%. If China applies one more SPM measure, Vietnam's export turnover will decrease by 0.3%.

Considering the results of the Japanese market, the results of the variables expressing the number of non-tariff measures show that the TBT and QR measures applied by Japan have no impact on the export turnover of Vietnamese agricultural products because the parameters of these variables are not statistically significant. However, the results of the SPM variable show the opposite effect between these measures on trade between the two countries, specifically, on average, if Japan applies one more SPM measure, Vietnam’s export turnover of agricultural products to Japan will fall by 1.6%

4.3. Research Results by Products

Table 3 shows the impact of non-tariff measures on trade flow at the product level. Commodities will be affected differently by GDP, while the economic size of Vietnam has a positive effect on coffee exports, but no significant effect on rice, seafood, and vegetables. Meanwhile, the size of the importing country's economy has a negative effect on coffee but a positive effect on seafood and vegetables. These results can be explained by the consumption structure of the importing country, as well as the characteristics of the exported goods.

The results of the distance variable representing the cost of trade show that geographical distance has a negative impact on most of the studied groups of agricultural products except seafood, in particular, the impact of distance on exports. Imports are relatively significant from 12% to 16%, depending on the group of goods studied. The estimated results also show that tariffs have a significant negative impact on Vietnam's agricultural exports, and coffee is particularly strongly affected by the proposed tariff measures. The measures, on average, reduce coffee exports by 12%.

Table 3.
Results of estimating the impact of non-tariff measures by item.

Variables	**Coffee (1)**	**Rice (2)**	**Seafood (3)**	**Vegetables (4)**
$lnGDP_{VN}$	2.64 (0.000)	-5.08 (0.386)	-2.19 (0.052)	0.475 (0.692)
$lnGDP_j$	-3.271 (0.002)	6.31 (0.118)	5.096 (0.000)	2.173 (0.011)
LnDIST	-16.97 (0.000)	-14.74 (0.048)	-1.182 (0.275)	-12.52 (0.002)
Ln(1+Tariff)	-12.7 (0.000)	-0.304 (0.000)	-0.0142 (0.818)	-0.191 (0.000)
TBT	-0.009 (0.548)	0.0167 (0.692)	0.0041 (0.664)	-0.0251 (0.220)
SPM	-0.0166 (0.000)	0.0093 (0.707)	0.0114 0.007	-0.0027 (0.435)
CV			-0.270 (0.033)	
QR				-0.0846 (0.257)

Note: The P-values of the results are shown in parentheses. Columns (1) (2) (3) (4) show the estimated results of coffee, rice, seafood, and vegetables, respectively.

The results of the model show that non-tariff measures have different effects on each commodity group. For coffee, according to the results, Vietnam's coffee is only affected by SPM sanitary and phytosanitary measures. Specifically, if the

number of SPM measures increases to 1, Vietnam's coffee exports will decrease by 1.6%. TBT measures have no significant impact on Vietnam's coffee exports. From that, it can be seen that, for coffee, technical measures are not too high, and Vietnamese exporters can meet them. However, Vietnamese enterprises face more difficulties in adapting and responding to the SPM sanitary and phytosanitary measures set forth by countries for green coffee.

For rice, it can be seen that the parameters of the SPM and TBT measures are not statistically significant. From that, it can be concluded that the TBT and SPM measures have no effect on Vietnam's rice exports. The above results can be explained through the following reasons, the TBT and SPM measures in the studied countries are simple in nature and do not tend to create barriers for goods, including rice. Therefore, Vietnamese enterprises are capable of producing goods that meet all the requirements of the studied markets.

For seafood, the results show that Vietnam's seafood exports are not affected by TBT measures, because the parameters of these variables are not statistically significant. Only SPM measures have an impact on Vietnam's seafood exports, specifically, on average, if the number of SPM measures increases by one, Vietnam's seafood export turnover will increase by 1.1%. Sanitary and phytosanitary measures (SPM) contribute to improving the safety of Vietnam's seafood products, thereby contributing to increasing consumer confidence in this item, and boosting demand and exports. Vietnam's seafood exports to the studied markets. In addition, countervailing measures (CV) have a special negative effect on Vietnam's seafood exports, on average, the number of anti-subsidy measures increases by 1, which will reduce seafood export turnover by 30%.

For vegetables, the parameters of the variables SPM, TBT, and QR, although all have negative signs, showing the opposite effect between these non-tariff measures and export turnover, these parameters are not statistically significant due to the P-value greater than 0.05. This positive result is due to the fact that the quality of Vietnam's products is sufficient to meet the TBT and SPM measures of the trading countries. In addition, the regulations on TBT and SPM of these countries are not barriers, but merely to improve the quality of products for domestic consumption.

5. Counter Measures to Continue Promoting the Agricultural and Seafood Export of Vietnam in the Coming Time

From the above research results, it is shown that Vietnam's agricultural and seafood exports are facing many difficulties from the application of non-tariff measures in some main import markets. SPM measures of the EU and China as well as countervailing measures of the US are having the biggest impact on Vietnam's exports of agricultural and seafood products. Coffee is the commodity most affected by SPM measures, while seafood is strongly affected by the application of countervailing measures of the import market. Therefore, in the coming time, Vietnam needs to implement the following solutions to continue promoting the export of key agricultural products such as:

- Continue to negotiate and sign agreements with trading partners on opening the market for agricultural and seafood products and agreements on mutual recognition of testing, quarantine, hygiene, and food safety for export agricultural products in order to help enterprises expand export markets with preferential, fair, and uniform trade conditions.
- Regularly update regulations from the import market to proactively take appropriate and effective response measures. Functional agencies take important roles in updating and timely notification of information on non-tariff measures, as well as supporting businesses and associations, so that businesses, associations, and farming households, cooperatives can quickly respond to technical regulations or regulations related to sanitary and phytosanitary measures, respond to investigations applying trade remedies, etc.
- Promote the application of scientific and technological achievements to create quality agricultural products, meeting the regulations on technical, food safety, sanitary and phytosanitary requirements, packaging, and labeling of the import market. In particular, the State should have policies to encourage and support enterprises to apply science and technology, especially high technology, in order to improve their ability to meet the export market’s regulations.
- Strengthen linkages between farmers – enterprises - scientists; continue to build linkages in the production, preservation, processing, and distribution of agricultural products, effectively participating in the global agricultural production network and value chain to meet the requirements of both quantity and quality, ensuring clear and reliable traceability.
- Diversify export markets, diversify export products, and promote the export of agricultural products and seafood products of Vietnam.

6. Conclusion

The article uses the structural gravity model and PPML (Poisson Pseudo-Maximum Likelihood) estimation method to evaluate the impact of non-tariff measures on Vietnam's agricultural and seafood exports to some major markets. The research results show that the SPM measures applied in the EU, China, and Japan as well as the countervailing measures applied in the EU and the US have a hindering effect on the export of agricultural and seafood products of Vietnam. However, with the efforts of management agencies and businesses, Vietnam's agricultural and seafood exports have tended to grow well in recent years and continue to maintain growth in the context of post-COVID-19. The export turnover of agricultural and seafood products from Vietnam to some main markets such as China, the EU, the US, and Japan has been maintained relatively stable. However, in the face of the trend of using non-tariff measures to protect human health and safety, protect animal and plant life, protect the environment, and operate fair competition in developing countries, Vietnam

needs to actively update market regulations to flexibly respond and improve the ability of export agricultural and seafood products to meet regulations of import markets.

References

[1] Ministry of Industry and Trade, "Import-export report for the years 2017-2021. Industry and Trade Publishing House. Available at https://vntr.moit.gov.vn/news/vietnam-import-export-report-2021 " 2021.

[2] Vietnam Ministry of Industry and Trade, "Import-export report for the year 2021. Industry and Trade Publishing House. Retrieved from: https://vntr.moit.gov.vn/news/vietnam-import-export-report-2021," 2021.

[3] UNCATAD, "International classification of non-tariff measures, United Nation. Retrieved from: https://unctad.org/topic/trade-analysis/non-tariff-measures/NTMs-classification," 2019.

[4] E. Yalcin, G. Felbermayr, and L. Kinzius, "Hidden protectionism: Non-tariff barriers and implications for international trade," *Ifo Center for International Economics*, pp. 8-18, 2017.

[5] Y. Dong and Y. Zhu, "Impact of SPS measures imposed by developed countries on China's tea export—A perspective of differences in standards," *Applied Economics and Finance*, vol. 2, no. 4, pp. 160-169, 2015. https://doi.org/10.11114/aef.v2i4.1175

[6] L. Dou, M. Nakagawa, F. Yan, and P. Li, "The impact of food safety standards on China's export of vegetables and fruits," *International Journal of Nutrition and Food Engineering*, vol. 7, no. 5, pp. 290-298, 2013.

[7] J. Wood, J. Wu, Y. Li, and H. Jang, "The economic impact of SPS measures on agricultural exports to China: An empirical analysis using the PPML method," *Social Sciences*, vol. 6, no. 2, pp. 1-18, 2017. https://doi.org/10.3390/socsci6020051

[8] K. R. Baylis, L. Nogueira, and K. Pace, "Something fishy: Tariff vs non-tariff barriers in seafood trade (No. 962-2016-74924)," 2012.

[9] A. V. T. Nguyen and N. Wilson, "Effects of food safety standards on seafood exports to US, EU and Japan," Southern Agricultural Economics Association. (No. 46758), 2009.