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Impacts of EVFTA on the exportation of Vietnamese agricultural products to the EU market

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Abstract

This study aims to appraise the potential impacts of the European Union - Vietnam Free Trade Agreement (EVFTA) on Vietnam's agricultural exports to the European Union (EU). The authors apply the SMART model to quantitatively estimate how tariff elimination under this agreement affects trade value between two parties, with the base year of 2018. By simulating the zero-rate tariff scenario for 17 2-digit HS codes of agricultural goods, the authors analyze the total change in export, trade creation, and trade diversion effects of the whole sector. The four important product groups that witnessed the highest change, including HS 04 (dairy produce, birds' eggs; natural honey; edible products of animal origin), HS 08 (edible fruit and nuts, peel of citrus fruit or melons), HS 09 (coffee, tea, maté, and spices) and HS 20 (preparations of vegetables, fruit, nuts or other parts of plants) are further classified into products with 4-6-digit HS codes to find out the specific product lines that benefit the most. The SMART outputs reveal that EVFTA positively affects the export of agricultural products from Vietnam to the EU market, with trade diversion dominating trade creation effects. Based on these findings, recommendations are proposed to the state authorities as well as domestic enterprises to promote the export of farm produce.

Keywords: Impacts, EVFTA, Agricultural products, Vietnam, EU

1. Introduction

For 30 years from the diplomatic relation establishment on 28 November 1990, Vietnam and the EU have become strategic economic partners. In 2019, the EU accounted for over USD 41.48 billion export value of Vietnam, which drove the Union to be the second-largest export

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market of the country, after the United States (General Department of Customs, 2020). The recent EVFTA signed on 30 June 2019, after 14 rounds of negotiations, is evaluated as the most ambitious free trade agreement (FTA) that the EU has signed with a developing country. It especially marks a milestone that Vietnam becomes the second country in ASEAN, which follows Singapore, and the first developing country in the region to sign an FTA with the Union (Vietnam Ministry of Foreign Affairs, 2019).

Among Vietnamese goods exported to the EU market, agricultural products belong to the most important and potential groups. Currently, the EU is the second-largest market importing farm produce from Vietnam, with over USD 2.86 billion in 2018, which is only after China. The EU typically prefers coffee, cashew nuts, vegetables, and fruits from Vietnam. The export growth rate of Vietnamese agricultural goods has remained stable at around 10% per year and is expected to rise further with the conclusion of the EVFTA, according to WTO Center-VCCI. Lately, the agreement has aroused the interest of domestic exporting firms. Nevertheless, there has been no rigorous prediction based on quantitative research of the EVFTA impacts on the agricultural sector. Therefore, the topic of whether the EVFTA has significant effects on the export of Vietnam's agricultural goods deserves thorough research to help the country prepare better for upcoming opportunities and challenges derived from this agreement.

This research aims to quantitatively estimate the impact magnitude of the EVFTA on the whole Vietnamese agricultural exports to the Union, as well as identify kinds of products that will be affected the most by using the SMART model. To achieve the research purposes, the authors concentrate on analyzing the change in export, trade creation, and trade diversion effects from the SMART's outputs to see how tariff dismantlement under the EVFTA will influence Vietnam's agricultural exports. The results indicate that Vietnamese agricultural exports to the EU will increase quite considerably, and trade diversion overshadows trade creation effects. Based on that, some recommendations to domestic agricultural exporting enterprises and related ministries are also endorsed to stimulate the export of these products.

The paper is comprised of five parts. The first part is the introduction to the subject matter, the second is the literature review of FTA as well as the impacts of tariff changes under FTA on the exportation of a country. After that, the research methodology is systematically presented. In the final two parts, the authors analyze the final results and suggest recommendations to related organizations.

2. Literature review

2.1 Theoretical framework for impact assessment of FTA on exportation

2.1.1 Regarding FTA and the impact of tariff changes under FTA on exports

Traditional and new-generation FTA

FTA is traditionally defined as a "treaty between two or more countries to establish a free trade area where commerce in goods and services can be conducted across their common borders, without tariffs or hindrances but (in contrast to a common market) capital or labor

may not move freely" (Awe, 2009). Plummer *et al.* (2010) explain that FTA is "a commitment by signatory members to remove tariffs across member states while continuing to maintain independent tariff regimes on imports from outside countries".

Most of the FTAs negotiated and signed in the early stages are traditional FTAs, which normally have a narrow scope and limited liberalization. Their contents mostly focus on trade liberalization commitment on goods, and the most crucial facet is eliminating up to about 70-80% of tariff lines. Some FTAs also mention a commitment to trade in services and principles of investments, intellectual property and competition. Nonetheless, the commitments on these matters are quite general and tightly bound.

The recently signed new-generation FTAs cover a wider scope of content and have higher commitment levels compared to the traditional ones. Apart from eliminating tariffs and non-tariff barriers (NTBs), the new-generation FTAs mention other matters not given in GATT/WTO, such as commitments on trade facilitation, government procurement, or sustainable development. The tariff elimination under these FTAs can be up to 95-100%.

EU-Vietnam Free Trade Agreement

The EVFTA is a new-generation FTA signed between Vietnam and the 28 EU's Member States. However, since the United Kingdom (UK) has left this Union on 31 January 2020, the EVFTA becomes the treatment between Vietnam and 27 EU countries. The agreement experienced 14 rounds of negotiation before being concluded and officially signed on 30 June 2019 in Hanoi, Vietnam. In terms of the content, it has 17 chapters, two protocols, and several attached memorandums that cover both traditional and new aspects.

After the trade deal came into force, the EU pledged to eliminate 85.6% of import tariffs on Vietnamese goods, which is equivalent to 70.3% of Vietnam's revenue from exports to the Union. And within 7 years, the EU will remove up to 99.2% of tariffs, which is equivalent to 99.7% of Vietnam's revenue from exports to the EU. For the remaining 0.3% of Vietnam's exports, which include rice, sweet corns, mushroom, sugar, and high-sugar-based products, starch, and canned tuna, the Union committed to providing Vietnam with a tariff-rate quota (TRQ), with the import tax rate set at 0% within the quota. There are also several agricultural products whose tariffs will be completely removed after 3-5 years.

Impact of tariff changes under FTA on exports

Since the Doha development round of the WTO, the trade effects of FTAs have become a controversial topic among economists (Thu *et al.*, 2018). While some view FTAs as a strong driver to move nations toward free multilateral trade (Freund, 2000), others argue that the tremendous number of FTAs have impeded domestic production and non-FTA members by eliminating tariffs between partners (Levy, 1997). In his book called Customs Union Issue, Viner (1950) claims that the net effect of trade liberalization resulting from the formation of FTA is ambiguous and depends on the relative dominance of trade creation and trade diversion effects. Viner (1950) defines trade creation as the displacement of less efficient

national production in favor of more efficient FTA partner-country production. On the other hand, trade diversion is a change in the location of production of imports from a lower-cost non-member country to a higher-cost member country.

From the exporters' viewpoint, Aggarwal (2004) points out that when a government agrees to reduce its import tariff on a particular product under an FTA, this alters the competitive relationship between imported and domestic products in favor of the former, and thereby provides greater market access to foreign producers. Aggarwal (2004) also mentions that tariff concessions may not have the desired impact on market access across all the sectors though they can be interpreted as accelerating the momentum for freer world trade. The effect of tariff reduction on market access of the exporters depends on the price elasticity of demand and supply, which interact to determine the price elasticity of exports. It is expected that the more elastic the price responsiveness of exports is, the greater effects a new tariff policy will bring.

2.1.2 Regarding methods to evaluate the impact of FTA on exportation

Trade indicators

A trade indicator is an index or a ratio used to describe and assess the state of trade flows and trade patterns of a particular economy (Mikic and Gilbert, 2007). Many studies use trade indicators to analyze the impacts of an FTA on trade between two countries before using other quantitative methods to anticipate the exact impact results (Vu, 2017). Some widely used indicators for FTA's assessment are revealed comparative advantage (RCA), export specialization (ES), trade complementarity (TC), and intra-industry trade (IIT).

Gravity model

The gravity model is a popular econometric model in international trade, especially in assessing the ex-post impacts of an FTA. This model was first built by Tinbergen (1962), which is based on Newton's gravity law in physics. Tinbergen (1962) develops a regression model under the name Gravity as an analogy to explain the bilateral trade by the national incomes of the trading countries and the distance between them. The model says that we expect larger country pairs to trade more and countries that are further apart to trade less. After Tinbergen, many economists added population variables in the group of variables representing the size of economies, or FTA and tariff as dummy variables to estimate the impact of an FTA on bilateral trade.

Computable general equilibrium model

The Computable General Equilibrium (CGE) model is a quantitative method that simulates the core economic interactions and has been a standard tool for conducting large-scale impact assessments of FTAs since the late 1980s. This computer-based modeling begins with a pre-policy baseline, on which simulations are run to determine the post-policy effects. In the analysis of an FTA, the exogenous variables are typically trade policy variables, elasticities, and share parameters. The endogenous variables in a CGE model of an FTA are prices, import and export volumes, household income, tariff revenue, consumer surplus, and producer surplus.

Partial equilibrium model (SMART model)

The partial equilibrium model known as the SMART (Software for Market Analysis and Restrictions on Trade) model was built based on economic theories and Viner's theory (1950) to support trade-related policies. This model and the simulation tool are part of the World Integrated Trade Solution (WITS) database and software suite provided jointly by the World Bank and United Nations Conference on Trade and Development (UNCTAD). It can be used to calculate trade effect, trade creation, trade diversion, and welfare effects of a tariff change for a single product (Amjadi *et al*., 2011).

2.2 Empirical researches on impact assessment of FTA on exportation

Vu and Nguyen (2016) evaluate the potential impacts of the EVFTA on different industries using four kinds of trade indicators. The results reveal that the trade between Vietnam and the EU is mainly inter-industry due to the differences in export/import structure, RCA, and ES between both parties.

Yang and Martinez-Zarzoso (2014) study the trade creation and trade diversion effects of the ASEAN-China FTA (ACFTA) on exports by using the gravity model. The model is tested for agricultural raw materials, manufactured goods, chemical products, machinery, and transport equipment. The findings show that the ACFTA leads to substantial trade creation. The tariff reduction from the FTA promotes total trade not only among intra-bloc member countries but also between intra-bloc and extra-bloc countries.

Nguyen *et al.* (2015), Nguyen (2016), and Vu (2017) measure the effects of tariff reduction under the EVFTA on the bilateral trade between Vietnam and the EU, using the Gravity model. They share the same findings that the decrease of import tariffs from both signatories would lead to an increase in trade from each side, but the reduction of tariff from Vietnam would be more significant than that of the EU.

Chaufflour *et al.* (2011), Von Cramon-Taubadel *et al.* (2010), and Kocourek and Simanová (2018) adopt the CGE model to shed light on the impact of the FTA. Chaufflour *et al.* (2011) conclude that the removal of agricultural protection by the EU may result in significant welfare gains to Ukraine. The most-affected products would be their key exports, including cereal, wheat, barley, maize, and sunflower oil. Kocourek and Simanová (2018) indicate that the change in the aggregate performance of the Czech economy would be varying slightly by the impacts of the EVFTA.

Guei *et al.* (2017) use trade data of the year 2012 available in the WITS-SMART model to measure the revenue, welfare, and trade effects under the Trade Development and Cooperation Agreement between the EU and South Africa. The study finds out the positive trade effects of the FTA on South Africa. Both the country's exports and total welfare are expected to increase and total trade creation would be higher than the trade diversion effect.

Ha (2016), Vo *et al.* (2018), and Pham (2019) utilize the SMART model to assess the ex-ante impacts of the EVFTA on Vietnam's exports. Ha (2016) employs both SMART and regression

models to assess how the EVFTA would influence Vietnam's timber industry. Vo *et al.* (2018) especially delve into Vietnam's apparel export, while Pham (2019) analyzes trade creation and trade diversion effects from the SMART's outputs for Vietnamese seafood. They all conclude that the EVFTA would have positive impacts on the export of Vietnam.

From the above literature review, it can be seen that there has been no ex-ante research on the effects of the EVFTA on agricultural products from Vietnam's perspective.

3. Research methodology

3.1 Research model and input data explanations

After reviewing the above theoretical frameworks and empirical researches, the authors decide to apply the SMART model in this research to evaluate the impact of tariff reduction under the EVFTA on Vietnam's agricultural goods export to the EU. This model is the most suitable for the study due to reasons as follows:

First of all, the SMART model normally acts as a prediction model to estimate the ex-ante effect of an FTA by simulating the new tariff scenario from the base year's figures, which is appropriate with the research subject and has not been implemented before.

Secondly, unlike the CGE approach that analyzes all markets simultaneously, the SMART model allows evaluation of an FTA's impact on a specific industry or commodity at a fairly disaggregated level, even at a 6-digit HS code. This advantage makes the research's focus on solely agricultural products, not the whole economy, possible.

Thirdly, this model requires minimal data such as trade flows, a tariff applied in new trade policy, and some parameters of elasticity, which is timely and able to capture short and medium-term effects (Vu and Pham, 2017).

Although the SMART model has its limitation of ignoring the indirect effects of trade policy changes in other markets to indicate inter-industry and feedback effects, this limitation could be negligible since the research delves into the impacts primarily on the agriculture sector.

Therefore, the authors apply this model to the case of Vietnam, which is an exporter of agricultural products in this study, focusing on trade creation, trade diversion effects, and change in total export to the EU. Other SMART outputs about tariff revenue and welfare of the importer side will not be analyzed.

Based on the SMART simulation tool provided by the WITS database of the World Bank and UNCTAD, the authors suggest a research model with six inputs and three outputs as described in Figure 1. The equations for trade creation and trade diversion are derived from Laird and Yeats (1986).

The research model uses several input data. Export value of agricultural products is the value of Vietnamese agricultural products exported to the EU in the base year of 2018. From the importer's view, this value can be regarded as the import value of Vietnam's agricultural goods of the EU. This is the real value measured in the condition of the applied MFN tariff rates,

which are collected from secondary sources of data. Then the SMART model will simulate different tariff scenarios for the base year's export figures to see how they will change.

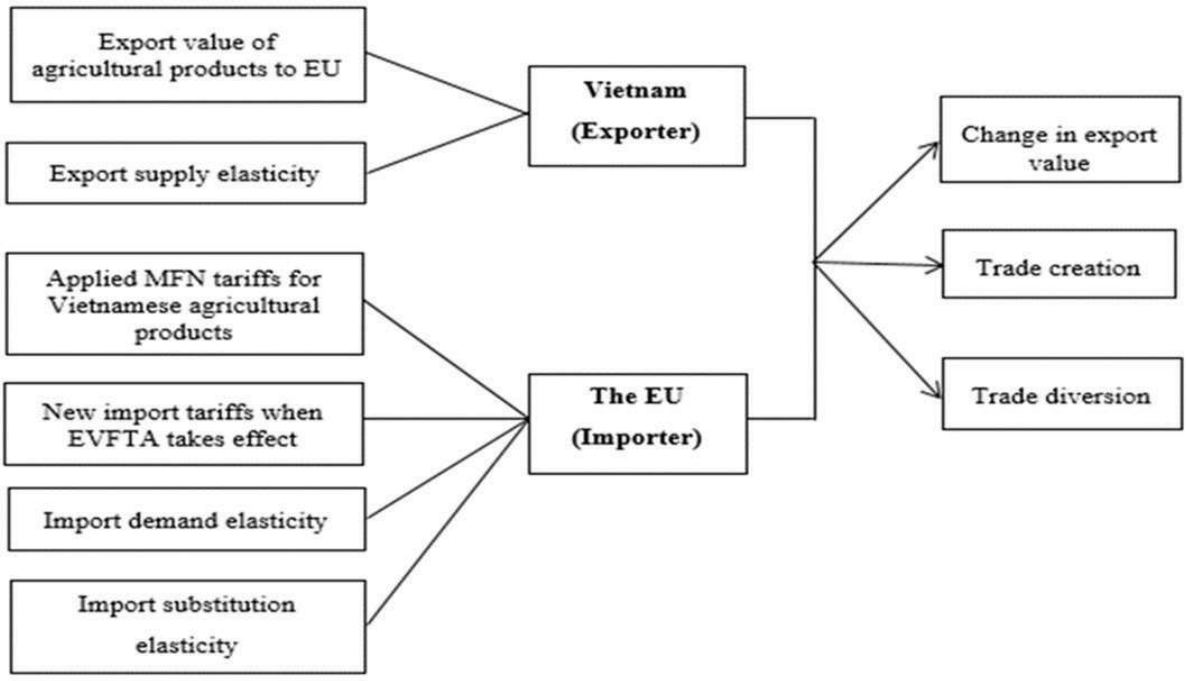

Figure 1. Research model

Source: Authors' compilation

Applied MFN tariffs are the most-favored-nation tariff rates that the EU is currently imposing on Vietnamese agricultural goods under the commitment of WTO's member states. Based on the discrepancy between MFN rates and the EVFTA's tariff schedule, the SMART model can estimate the effect of tariff elimination on the trade flow, trade creation, and diversion between Vietnam and the EU.

New import tariffs are the tariff rates that the EU promised to apply for Vietnamese goods when the EVFTA comes into force. For agricultural goods, most tariff lines will be cut to 0% immediately, except for a minority of products that are subject to TRQs or with longer tariff cut-off periods.

Import demand elasticity and export supply elasticity are input parameters of the SMART model to calculate the trade creation effect. The import demand elasticity shows the relationship between changes in the price index and its impact on the demand of the importing country for a commodity. This parameter is based on Armington's assumption (1969) that commodities are differentiated by their country of origin, which means that goods imported from a country cannot perfectly substitute the similar goods imported from another country. This assumption is correct for Vietnam since agricultural goods from Vietnam are different from those imported from other non-partner countries to the EU.

The export supply elasticity, on the other hand, presents the degree of responsiveness of the exporter's supply to changes in the price, considering that different countries compete to export to the same market. The SMART model assumes that export supply elasticity is infinite, which implies that the exporter can export as much of the goods as possible at a certain price (Plummer *et al.*, 2010).

Import substitution elasticity is also an important parameter in the SMART to calculate the trade diversion effect. It presents the degree of responsiveness of consumers in the importing country to a change in the relative price in the product markets after a tariff reduction. This elasticity is based on the 2-stage optimization process that involves consumers allocating their spending by commodity and by national variety.

3.2 Product description

The authors simulate 17 2-digit-HS codes from Chapter 01 to Chapter 24, excluding Chapter 03 and 16, that belong to agricultural groups, according to the classification of WTO's Agricultural Agreement. HS Chapter 01, 05, 12, 14, and 23, despite being agricultural goods, are also omitted in the model because their simple average most favoured nation (MFN) rate is less than 0.5% in the base year. As their tariff rates are too close to 0%, the estimated effect of tariff reduction will be insignificant for analysis. To analyze at a more disaggregated level, based on the HS-2's results, the authors continue to run 4-6-digit HS code simulations for some key agricultural exports of Vietnam which are still facing high import tariffs in the base year and witness the highest export changes after the tariff is cut down to 0%. In this way, both the overall impact of EVFTA on the whole agricultural exports and individual products will be indicated, which helps to recognize which products are most affected.

3.3 Data collection and analysis

For running the SMART model, the authors collect the export values of different agricultural HS groups from Vietnam to the EU in the base year of 2018 from UN COMTRADE and Trade Map, and the MFN tariff rates imposed by the EU for those products from UNCTAD TRAINS and WTO's IDB. These figures can be automatically extracted by the online software provided by the World Bank and UNCTAD upon request or collected manually.

Additionally, three parameters reflecting consumer and exporter behaviors to calibrate the simulation, which is import demand elasticity (Em); export supply elasticity (Ex); and substitution elasticity (Es), are extracted from the WITS database. The Ex and Es, by default, are equal to 99 and 1.5, respectively, while the Em value varies among different HS codes and is primarily based on the calculations of the World Bank research team (Vo *et al.*, 2018). The authors use these default and pre-calculated values for three input parameters.

In terms of qualitative analysis, the authors collect and calculate secondary data of agricultural export turnover, growth rate, market, and product structure between 2010 and 2018 based on Trade Map's statistics, articles, reports, and studies from reliable sources like Vietnam's General Department of Customs, EU-MUTRAP, WTO-VCCI center.

This paper applies the SMART simulation model to quantitatively estimate the impacts of the EVFTA on Vietnam's export of agricultural goods by analyzing the change in export, trade creation, and trade diversion effects. The simulation scenario is when all EU tariffs for Vietnamese agricultural products that meet the requirements of origin and quality are cut down to 0%, except for some products which are subject to a tariff-rate quota.

After running this scenario, robustness and sensitivity tests are implemented to ensure that the simulation results are robust and accurate enough for policy implications by changing differing values of substitution elasticity (Ratisai, 2014, Zgovu and Kweka, 2008). The research applies the lower bound (Es=0.5), upper bound (Es=2), and best case (Es=6) as used in Guei *et al.* (2017). The Ex is equal to 99 in these cases because of the infinite export supply assumption (Table 1).

Table 1. Elasticities used in the sensitivity analysis

Elasticity	Lower bound	Base case	Upper bound	Best case
Substitution elasticity	0.5	1.5	2	6
Export supply Elasticity	99	99	99	99

Source: Authors' compilation

The authors also conduct structured in-depth interviews with some experts for their opinions on the impacts of the EVFTA on Vietnam's agricultural exports as well as the research model's appropriateness. In the interview, an expert in the field of international economic integration, who is also a reporter of Vietnam Ministry of Industry and Trade, noted that: "In evaluation and comparison of FTA's potential impact, SMART model is frequently used, but not always giving correct results if the data and subject are not relevant." Another expert from the HCMC Center of International Integration Support (CIIS) also expressed his advocate for the adoption of SMART as it could help to achieve the research purposes within the authors' resources. In general, both experts agree that SMART is an appropriate model to forecast the effect of a new FTA on bilateral trade. Their opinions would help to reinforce the secondary information and orient the authors better when collecting data and analyzing the final outputs.

4. Results

4.1 Change in export

When the tariff rate is cut down to 0%, the export value of agricultural goods from Vietnam to the EU increases by over USD 37.53 million. The results for each HS group are presented in Table 2.

Preparations of vegetables, fruit, nuts, or other parts of plants (HS 20) is the product chapter that experiences the highest rise in export value, with approximately USD 11.6 million, which is about 19.5% higher than its original value. However, this growth rate is not the highest of all groups. Other chapters including HS 11 - Products of the milling industry with, malt, starches, inulin, wheat gluten; HS 04 - Dairy produce with birds' eggs, natural honey, edible products

of animal origin; and especially HS 24 - Tobacco and manufactured tobacco substitutes have higher growth rates, which are 31.21%, 36.61%, and 221.85%, respectively.

Table 2. Change in export for product categories at HS-2 level, ranging from the highest to lowest value

Product code	Applied MFN tariff rate (%)	Export before in USD 1000 (2018)	Export after in USD 1000	Export change in USD 1000	% of change in export
20	12.72	59,523.58	71,127.46	11,603.88	19.49
08	3.34	1,038,343.65	1,046,313.85	7,970.20	0.77
21	5.57	70,423.92	77,639.29	7,215.37	10.25
09	0.72	1,721,960.93	1,723,806.14	1,845.21	0.11
11	6.63	5,252.43	6,891.67	1,639.25	31.21
19	1.45	19,274.25	20,623.89	1,349.64	7.00
02	5.05	7,574.02	8,869.04	1,295.02	17.10
04	6.02	3,522.78	4,812.31	1,289.53	36.61
07	6.29	7,375.38	8,433.60	1,058.22	14.35
17	8.73	4,718.33	5,609.96	891.64	18.90
15	3.12	10,701.29	11,228.68	527.39	4.93
22	0.61	6,526.44	6,898.58	372.14	5.70
24	21.23	107.33	345.45	238.12	221.85
06	3.24	6,088.78	6,321.98	233.20	3.83
10	2.57	36.52	39.36	2.84	7.77
18	2.92	305.34	306.30	0.96	0.31
13	1.76	785.86	786.05	0.19	0.02
TOTAL		**2,962,520.83**	**3,000,053.61**	**37,532.79**	**1.27**

Source: Compiled & calculated by the authors from SMART's results

Ranking the second is Chapter HS 08 - Edible fruit and nuts, peel of citrus fruit or melons, with an increase of about USD 7.97 million, but its relative value is quite low at 0.77%. Though the initial tariff rate for Chapter HS 08 is not high at 3.34%, it will still gain huge benefits because the EU favors Vietnamese tropical fruits and always has a high demand for these products. The export value of edible fruits and nuts in 2018 was enormous, which was only after Chapter HS 09 with more than USD 1.038 billion, which was equal to 17 times the value of Chapter HS 20's figure. Noticeably, Chapter HS 08 is also the input material for Chapter HS 20, including prepared fruits and nuts. In general, fruits and nuts, whether fresh or processed, are the most potential products for Vietnam to promote export to the EU.

In Top 5, there are also Chapter HS 21 - Miscellaneous edible preparations, Chapter HS 09 - Coffee, tea, maté and spices, and Chapter HS 11 - Products of the milling industry, malt, starches. The export revenue of Chapter HS 21 rises by roughly USD 7.2 million, which is

nearly as equal as Chapter HS 08, but its relative rate is more significant than Chapter HS 08 because the base year's export of this group was only around USD 70.4 million. In terms of Chapters HS 09 and 11, it is not surprising when they appear at the top since both of these groups consist of key agricultural exports of Vietnam, including coffee (HS 0901), tea (HS 0902), pepper (HS 0904), and starch (HS 1108).

4.2 Trade creation effect

Of the total trade increase, the trade creation effect helps to bring around USD 15.04 million. The results of the trade creation effect from the 0% tariff policy for each group, ranking from highest to lowest value, are displayed in Table 3:

Table 3. Trade creation effect for product categories at HS-2 level

Product code	Applied MFN tariff rate (%)	Export before in USD 1000 (2018)	Trade creation effect in USD 1000	% of total trade creation effect
20	12.72	59,523.58	3,878.93	25.79
08	3.34	1,038,343.65	3,104.13	20.64
21	5.57	70,423.92	2,540.27	16.89
11	6.63	5,252.43	1,285.79	8.55
09	0.72	1,721,960.93	986.35	6.56
02	5.05	7,574.02	742.74	4.94
19	1.45	19,274.25	681.95	4.53
04	6.02	3,522.78	524.30	3.49
07	6.29	7,375.38	351.46	2.34
17	8.73	4,718.33	285.16	1.90
15	3.12	10,701.29	269.06	1.79
24	21.23	107.33	183.55	1.22
22	0.61	6,526.44	108.08	0.72
06	3.24	6,088.78	97.74	0.65
10	2.57	36.52	0.92	0.01
18	2.92	305.34	0.43	0.00
13	1.76	785.86	0.10	0.00
TOTAL		**2,962,520.83**	**15,040.95**	**100.00**

Source: Compiled & calculated by the authors from SMART's results

Being compatible with the export change's results, trade creation happens most strongly in Chapter HS 20, which enjoys an export gain of nearly USD 3.88 million and accounts for up to 25.79% of the total effect. In the second position, products in Chapter HS 08 account for 20.64% of the total trade creation, with an estimated increase of USD 3.1 million. Likewise, Chapter 09 - Coffee, tea, maté, and spices is also in the Top 5, driven by the

extremely large initial export value, rather than the higher tariff rate. Conversely, the simple average MFN rate for Chapter HS 09 is among the lowest at only 0.72%. MFN tariff for coffee, in particular, is not high, varying between 3% and 4%. However, since the group's export value before the EVFTA reached over USD 1.7 billion in 2018, the effect of trade creation is also massive.

Besides, there are two more groups in the Top 5, which are Chapter HS 21 - Miscellaneous edible preparations and Chapter 11 - Products of the milling industry, malt, starches, inulin, and wheat gluten. They are predicted to gain over USD 2.54 million and USD 1.285 million, respectively, from the trade creation effect. In general, the trade creation effect tends to be the highest for the products that Vietnam has competitive advantages like fruits, coffee, tea, and starch and the lowest with products Vietnam has occasional export and does not have an advantage in producing, including Chapter HS 13, 18, 6 and 22.

Table 4 considers deeper the impact of the FTA on product line Chapter HS 09 and Chapter HS 04. For Chapter HS 09, products HS 0901 - Coffee, whether or not roasted or decaffeinated, coffee husks and skins, coffee substitutes containing coffee in any proportion alone makes up USD 777,757 of total USD 986,351 trade creation of the group, accounting for 78.85%. This proves that coffee is one of the most advantageous products as well as a strong driver for Vietnam's agriculture export under the EVFTA.

Table 4. Trade creation effect for Chapter HS 0901 (Coffee) and Chapter HS 04 (Dairy produce; birds' eggs; natural honey; edible products of animal origin)

Product code	Applied MFN tariff rate (%)	Export before in USD 1000 (2018)	Trade creation effect in USD 1000	% of total trade creation effect
		HS 0901		
0901	2.9	1,536,294.14	777.76	100
09011		1,502,318.88	0	0.
090112	4.8	32,018.80	718.38	92.37
090121	2.6	1,883.64	57.60	7.41
090122	3.1	2.55	0.05	0.01
090190	4	70.27	1.73	0.22
		HS 04		
040790	4.2	0.69	0.01	0.00
040899	0	2.23	0	0.00
040900	17.3	3,426.82	503.01	95.94
041000	2.6	93.04	21.28	4.06

Source: Compiled & calculated by the authors from SMART's results

Going deeper into each product line, the simulation result indicates that Chapter HS 090112 - Coffee, not roasted, decaffeinated will gain the largest effect, with 92.37% of

the whole 0901. Though Product 090111 - Coffee, not roasted, not decaffeinated, had a distinctive export value of all lines in the base year, trade of this product will not have any change because the applied MFN rate for it has already been 0%. The remaining lines only witness minor effects, including Product 090121 - Coffee, roasted, not decaffeinated; 090122 - Coffee, roasted, decaffeinated; Product 090190 - Other (coffee husks and skins, coffee substitutes containing coffee). In general, the trade of roasted coffee is not as high as unroasted coffee.

This result stems from the factual situation of Vietnam's coffee industry. Vietnam is the second-largest coffee exporter in the world after Brazil, which mainly exports raw coffee beans rather than processed coffee. In 2018, processed coffee and instant coffee only accounted for 7% of the total export amount while coffee beans made up over 90% (Tam, 2019). Therefore, the profit was incompatible with the export volume because processed coffee always brings about higher profits than raw coffee.

For Chapter HS 04, almost all trade creation effect comes from Product 040900 – Natural honey, which accounts for approximately 96% of the total value, and the reduction in tariff is expected to bring about USD 503,006 for this product. In the base year, natural honey was the goods having the highest MFN tariff at 17.3% but trade value reached a dominant figure of over USD 3.4 million while trade in other products in this group was relatively low. Therefore, natural honey is a potential product of Vietnam that takes the largest advantage from the EVFTA.

Table 5. The top five product lines of Chapter/Group HS 08 (edible fruits and nuts) and Chapter HS 20 (preparations of vegetables, fruit, nuts, or other parts of plants) have the highest trade creation

Product code	Applied MFN tariff rate (%)	Export before in USD 1000 (2018)	Trade creation effect in USD 1000	% of total trade creation effect
		HS 08		
80550	7.65	16,983.05	1,084.77	34.95
81090	3.53	29,594.98	998.60	32.17
81190	5.94	16,226.88	782.01	25.19
81320	6.1	1,303.29	98.40	3.17
81350	3.64	822.20	59.16	1.91
		HS 20		
200989	11.15	5,197.00	1,438.84	37.09
200899	11.75	1,378.21	525.87	13.56
200819	3.47	895.43	375.18	9.67
200949	15.61	739.16	298.91	7.71
200110	14.1	631.76	293.78	7.57

Source: Compiled & calculated by the authors from SMART's results

For Chapter HS 08, Product line HS 080550 - Lemons and limes will be the most affected when making up nearly 35% of the total effect for the whole group. Having a narrow gap from it, Product line HS 081090, which contains a variety of tropical fruits like longans, lychees, rambutans, langsat (lanzones/longkong), and jackfruit, accounts for 31.17% trade creation, which is equal to USD 998,598.

The other three Product lines 081190, 081320, and 081350 are all dried and processed fruits or nuts. Though being in the Top 5, the sum of these groups is at USD 939,560, which is less than Product lines 080550 or 081090 alone. The reason why trade in processed fruits of Vietnam with the EU was so low is that our processing industry of agricultural products is still weak and insufficient. At the moment, the whole nation only has 150 fruit processing agencies.

In terms of processed vegetables and fruit, Product line HS 200989 - Juice of any other single fruit or vegetable, witnesses the highest trade creation effect of around 37% and is expected to gain over USD 1.43 million. Ranked closest to it are Products lines such as HS 200899 and HS 200819 - Fruit, nuts, and other edible parts of plants, otherwise prepared or preserved, of which Product line HS 200899 includes lychees, longans, and other tropical fruits, and Product line HS 200819 is mixtures, mainly cashew nuts, which are all the specialties of Vietnam.

The country has an advantage in planting and producing input materials for those groups. According to Vietnam's Institute of Agriculture Science, Vietnam has about 160,000 ha of plantation area of longans, lychees, rambutans, which brings about USD 320 million from export in 2018 (Chu, 2019).

4.3 Trade diversion effect

Trade diversion effect for product categories at HS-2 level, ranking from highest to lowest value is shown in Table 6. The results reveal that the total trade diversion effect is worth about USD 22.49 million, which is nearly 1.5 times as large as the trade creation effect. This explains that the EVFTA will lead to higher export of Vietnam's agricultural goods because the relative price of Vietnamese goods will be more competitive than the price of other agricultural exporters to the EU thanks to tariff reduction.

Chapter HS 20 continues to be the highest increasing group, which accounts for 34.35% of the total effect. Chapter HS 08 and HS 21 also make up significant proportions of over 20%, of which the trade diversion happening in the remaining groups is quite weak at less than 4%. While Vietnam will gain enormously when exporting to the EU, it is important to identify the non-EVFTA countries whose trade to the EU will be mostly diverted as a result of full tariff liberalization for Vietnamese goods. Tables 7 to 10 provide a list of the top 10 non-EVFTA countries that will suffer the largest losses in some key agricultural exports to the EU when a 0% tariff rate is applied for Vietnam.

Table 6. Trade diversion effect for product categories at HS-2 level

Product code	Total trade effect in USD 1000	Trade creation effect in USD 1000	Trade diversion effect in USD 1000	% of total trade diversion effect
20	11,603.88	3,878.93	7,724.95	34.35
08	7,970.20	3,104.13	4,866.08	21.63
21	7,215.37	2,540.27	4,675.10	20.79
09	1,845.21	986.35	858.85	3.82
04	1,289.53	524.30	765.23	3.40
07	1,058.22	351.46	706.76	3.14
19	1,349.64	681.95	667.70	2.97
17	891.64	285.16	606.47	2.70
02	1,295.02	742.74	552.28	2.46
11	1,639.25	1,285.80	353.46	1.57
22	372.14	108.08	264.07	1.17
15	527.39	269.06	258.33	1.15
06	233.20	97.74	135.46	0.60
24	238.12	183.55	54.57	0.24
10	2.84	0.92	1.91	0.01
18	0.96	0.43	0.53	0.00
13	0.19	0.10	0.09	0.00
TOTAL	**37,532.79**	**15,040.95**	**22,491.84**	**100.00**

Source: Compiled & calculated by the authors from SMART's results

Table 7. Top 10 non-EVFTA countries that account for the largest extent of trade diversion for coffee (HS 0901)

Reporter name	Partner name	Exports before in USD 1000	Exports after in USD 1000	Export change in revenue in USD 1000
EU	Mexico	112,670.82	112,329.11	-341.71
EU	Colombia	572,785.98	572,654.64	-131.339
EU	Brazil	2,321,582.09	2,321,510.09	-71.994
EU	Canada	2,434.96	2,363.19	-71.778
EU	Switzerland	1,825,257.00	1,825,186.57	-70.379
EU	Honduras	663,725.48	663,693.82	-31.66
EU	United States	19,825.36	19,804.27	-21.093
EU	Peru	393,331.09	393,316.13	-14.958
EU	Uganda	336,715.81	336,706.34	-9.472
EU	Ethiopia	290,165.95	290,158.49	-7.462

Source: Compiled & calculated by the authors from SMART's results

The top three countries that will suffer the largest losses in coffee export from the EVFTA are Mexico, Colombia, and Brazil, which are shown in Table 7. Mexico is estimated to lose most heavily with USD 341,710. Colombia will lose USD 131,339 while Brazil will just reduce about half of Colombia's with USD 71,994. To explain this, Mexican coffee mainly took benefit of lower prices due to 0% import duty to the EU as a result of the EU-Mexico trade agreement. When Vietnam is also granted the same benefit after the EVFTA takes effect, it is hard for Mexico to compete with Vietnamese coffee.

Regarding Brazil, as a member of the MERCOSUR group, although this country finished the negotiation process of the EU-MERCOSUR FTA on 28 June 2019, this agreement has not yet become effective. At present, Brazil's coffee is still facing a relatively high tariff with 9% for instant coffee and 7.5% for roasted and ground coffee. For Colombia, though the EU's duty for their coffee has already been 0% thanks to their trade agreement with the EU within the Andean Community, Colombia does not have comparative advantages in producing coffee compared with Vietnam. A part of their exports will be replaced by Vietnamese coffee.

Table 8. Top 10 non-EVFTA countries that account for the largest extent of trade diversion for edible fruits and nuts (HS 08)

Reporter name	Partner name	Exports before in USD 1000	Exports after in USD 1000	Export change in revenue in USD 1000
EU	Argentina	583,324.86	582,711.86	-612.99
EU	Turkey	2,158,572.77	2,158,075.03	-497.74
EU	South Africa	2,385,337.20	2,384,881.05	-456.14
EU	Colombia	1,599,880.04	1,599,541.67	-338.43
EU	Brazil	1,144,715.16	1,144,420.41	-294.75
EU	Peru	1,715,989.81	1,715,702.33	-287.47
EU	Mexico	426,371.12	426,115.00	-256.12
EU	Canada	124,011.11	123,773.59	-237.52
EU	Madagascar	67,311.44	67,091.57	-219.86
EU	Ukraine	208,610.20	208,425.95	-184.24

Source: Compiled & calculated by the authors from SMART's results

Regarding edible fruits and nuts, the results of trade diversion from Table 8 show that Argentina will be the most negatively affected country from the EVFTA, with an estimated loss of nearly USD 613,000 export turnover. After Argentina, Turkey and South Africa will lose almost the same, which are USD 497,735 and USD 456,140, respectively.

Currently, products of the Chapter HS 08 from Argentina and Brazil exported to the EU market are still facing high tariff rates of 6.96% and 5.94%, respectively, on average, while most tariff lines in this group were reduced to 0% for Turkey, South Africa, and Colombia. However, South American countries are still important agricultural suppliers for the EU.

In 2018, Argentina exported over USD 366 million edible fruits and nuts to this market, accounting for 36.3% of its total export to the world.

Ranking second and third in the list are Turkey and South Africa. Both of these countries are among the biggest exporters of fresh fruits in the world. In 2018, Turkey exported USD 1.89 billion to the EU, representing 47.7% of the total value. South Africa exported USD 1.68 billion to the EU, accounting for 45.75% of export value to the world.

Table 9. Top 10 non-EVFTA countries that account for the largest extent of trade diversion for HS 04

Reporter name	Partner name	Exports before in USD 1000	Exports after in USD 1000	Export change in revenue in USD 1000
EU	China	153,807.56	153,619.63	-187.94
EU	Ukraine	110,274.52	110,147.20	-127.31
EU	Mexico	80,092.39	79,985.82	-106.57
EU	Argentina	64,180.53	64,099.24	-81.29
EU	New Zealand	59,115.87	59,038.15	-77.72
EU	Chile	30,016.14	29,976.62	-39.52
EU	Brazil	25,121.40	25,088.90	-32.50
EU	Turkey	19,825.37	19,799.48	-25.89
EU	Uruguay	12,746.06	12,729.51	-16.54
EU	Cuba	11,656.59	11,641.13	-15.46

Source: Compiled & calculated by the authors from SMART's results

For Chapter HS 04 in Table 9, the country that will be most affected by trade diversion from EVFTA is China, with the estimation of USD 187,938 loss. Ukraine, Mexico, and Argentina are the followers. Both Ukraine and Mexico will lose over USD 100,000 while Argentina reduces about USD 81,289. The top countries on the list are the main honey exporters to the EU. According to Europa's statistics in 2018, imports of honey from non-EU countries came mainly from China with 80,000 tons, accounting for 39% of total extra-EU honey imports, which is ahead of Ukraine with 41,000 tons accounting for 20%). This figure is followed by Argentina (25,000 tons, 12%), Mexico (21,000 tons, 10%), and Chile (8,000 tons, 4%).

Apart from Ukraine, which is a beneficiary of the EU's Generalized System of Preferences (GSP), China, Mexico and Argentina are all facing the same MFN tariff rate as Vietnam for natural honey when exporting to the EU market. This rate is among the highest rates of all agricultural products. Therefore, if the tariff rate of Vietnamese natural honey is fully eliminated within the EVFTA, the relative price of Vietnamese honey will be considerably cheaper than Chinese, Mexican, or Argentina's honey. A part of honey

imported from these countries before will be substituted by Vietnam's products if the same quality is guaranteed.

Table 10. Top 10 non-EVFTA countries that account for the largest extent of trade diversion for HS 20

Reporter name	Partner name	Exports before in USD 1000	Exports after in USD 1000	Export change in revenue in USD 1000
EU	Turkey	1,236,063.26	1,234,569.50	-1,493.79
EU	Thailand	280,595.41	279,869.73	-725.67
EU	Ecuador	93,416.59	92,924.02	-492.57
EU	China	592,890.59	592,405.24	-485.35
EU	India	236,210.86	235,764.76	-446.10
EU	United States	447,521.70	447,086.92	-434.78
EU	Brazil	1,869,533.07	1,869,112.90	-420.20
EU	Peru	261,668.34	261,258.19	-410.15
EU	Philippines	123,736.58	123,398.93	-337.65
EU	Chile	122,710.20	122,386.00	-324.20

Source: Compiled & calculated by the authors from SMART's results

In terms of Chapter HS 20, which is shown in Table 10, half of the Top 10 countries that will witness the largest drop are Asian countries, including Turkey, Thailand, China, India, and the Philippines. Turkey has been recognized as the second most country in Chapter HS 08, and it now ranks first in Chapter HS 20. The relationship between these groups is that Chapter HS 08 is a part of the materials for Chapter HS 20. Turkey has always been the most important supplier of Chapter HS 20 for the EU and the country has a comparative advantage in both producing and manufacturing vegetables and fruits. In 2018, Turkey exported an enormous value of around USD 1.14 billion of prepared vegetables, fruits, and nuts to the EU, which constituted up to 60% of its total export. Thus, when Vietnam enjoys a 0% import duty for exporting edible fruits and nuts, it will be a threat to Turkey.

For Ecuador, the EU's tariff for their products was also dismantled since Ecuador joined the EU-Colombia/Peru trade agreement. Thailand, China, and India are still facing normal MFN tariff treatment with the Union. The simple average tariff for Chapter HS 20 of Thailand is the highest at 17.9%. That of China is 17.62% and that of India is 12.15% according to the WITS database. In 2018, Thailand exported 14.3% of its processed fruits and vegetables to the EU, which was USD 304.26 million. China's export was USD 902.2 million, accounting for about 11% of their total export. India's export was 228,627, accounting for 40%. Compared to them, Vietnam's figure was much smaller with USD 59.5 million. The fact that trade diversion is dominant over trade creation in Chapter HS 20 reveals that Vietnam has a comparative disadvantage in producing processed vegetables and fruits.

4.4 Sensitive analysis and robustness test

Three scenarios are considered under the SMART model to check the robustness of the base case results by measuring how trade creation and export value fluctuate presented in Table 11:

Table 11. Sensitivity and robustness test using different substitution elasticity

Effect	Lower bound (Es=0.5)	Base case (Es=1.5)	Upper bound (Es=2)	Best case (Es=6)
Trade creation	15,296.118	15,040.96	15,040.95	16,074.02
Change from the base case	1.6964 %	0 %	0.0001 %	6.8683 %
Export after	2,985,070.34	3,000,053.61	3,007,528.54	3,066,941.95
Change from the base case	0.50 %	0 %	0.25 %	2.23 %

Source: Compiled & calculated by the authors from SMART's results

The percentage of changes in these scenarios are calculated by the below formula:

$$\%\text{change} = \left| \frac{\text{Base case - Scenario value}}{\text{Base case}} \text{ x } 100\% \right|$$

When Es is reduced to 0.5 (lower bound), trade creation rises by around 1.69% while export value falls slightly by 0.5% compared to the base case. In the upper case when Es increases to 2, the trade creation effect nearly has no change while export will increase by 0.25%. Though export growth is insignificant in relative value, its absolute value is quite noticeable at over USD 7.5 million higher than the base case. Until Es is enhanced to 6, which is the best case, both trade creation effect and export grow roughly by 6.87%, which is equal to USD 1 million higher than the base case value, and 2.23%, which is USD 66.9 million higher, respectively. Hence, this is the best scenario for Vietnamese agriculture when the EVFTA takes effect. In general, the larger the substitution elasticity, the higher the trade diversion effect will be when products of other exporters to the EU are more likely to be replaced by cheaper products from Vietnam. However, in all scenarios, the percentage changes only range from 0% to 7%. Therefore, it can be concluded that the base case's results are quite robust and reliable since they are less sensitive to changes in the model's parameter.

5. Conclusions and recommendations

From the SMART simulation results, it is concluded that the EVFTA has positive impacts on the export of agricultural products to the EU by helping the total value rise by over USD 37.532 million. The trade effect occurs highest in the following groups: HS 20 - prepared vegetables, fruits, and nuts (especially fruit juice); HS 08, which is fresh fruits and nuts, HS 21 - miscellaneous edible preparations, HS 09 – mostly in unroasted coffee, HS 04 – mostly in natural honey. Another crucial finding is that trade diversion outweighs the trade creation effect, with 59.93%. This reveals that there will be a rise in agricultural export from Vietnam to the EU when a tariff is removed, resulted from the relatively lower price of Vietnamese goods in comparison to the price of other efficient agricultural exporters.

Table 12. Impacts of EVFTA on the importation of agricultural products from Vietnam to the EU

Effect	Value (in USD 1000)	Proportion (%)
Trade Creation	15,040.947	40.07
Trade Diversion	22,491.835	59.93
Total export change	37,532.788	100.00

Source: Compiled & calculated by the authors from SMART's results

The trade creation effect accounts for 40.07%, which is relatively high compared to the trade diversion. In some special product groups, such as coffee (HS 0901), starch (in HS 11), animal or vegetable fats, and oil (HS 15), trade creation is more than trade diversion. The growth of export to the EU due to the trade creation effect shows that Vietnam has comparative advantages in agricultural production compared to the EU's Member States. Therefore, by focusing on the goods with advantages, Vietnam will create an increase in export.

However, the larger trade diversion effect in most agricultural categories may pose some potential risks to Vietnam in the long-term. It is because the export growth will not come from the domestic advantages, but the lower relative price as a result of tariff removal. Taking advantage of the EVFTA never solely lies in its tariff reduction effect. As the EU market has been famous for its strictness in product quality, the standards for agricultural produce are even more complicated, the authors need to fulfill other NTBs before successfully enjoying zero duty rate.

Indeed, there are some main obstacles Vietnam is facing when exporting to the EU. Firstly, the EU's requirements related to technical barriers to trade, sanitary and phytosanitary measures, labeling, environment protection, and legislations are very strict and hard to comply with. The EU is applying a 5-clean procedure, which bans on using the prohibited chemicals in five stages: plantation/raising and harvesting; processing; packaging; preservation; and transportation. For vegetables and fruits, EC issued Council Regulation No. 2200/96 on the common market in fruits and vegetables, and products imported from countries outside the EU are required to follow this standard or at least equivalent standards.

Secondly, the Rules of Origin may be another obstacle for enterprises and farmers. To be granted favorable tariff, Vietnamese goods exported to the EU must have 100% materials from Vietnam or fulfill a certain percentage of Regional Value Content (materials from EU and/or Vietnam). This is a challenge for Vietnamese processing enterprises because they often import inputs from China or ASEAN.

Besides, Vietnam may face the threat of trade remedies from countries in the Union. Normally, when a tariff barrier is no longer a protective tool, the importing market tends to use anti-dumping, counter-subsidies, or safeguards to protect domestic industries. And the EU is also a market having the "tradition" of adopting these tools. Vietnam has encountered up to 78 anti-dumping lawsuits since joining WTO.

Recommendations to enterprises processing and exporting agricultural goods

From the research findings, domestic enterprises specializing in agricultural export are suggested to constantly improve their product quality so that Vietnamese goods will meet the Global GAP standard and become more competitive in the long run. The best way for the exporters to manage product quality is by acquiring their value chains. Besides, the processors having capital and resource potentials should upgrade their processing technologies since dried, prepared fruits and vegetables are proven to be the most promising products when EVFTA takes effect.

The agricultural exporting companies need to build their brands, labels and register for geographical indications (GI). When their brands are internationally recognized, the competitiveness of Vietnamese goods will be enhanced in the global landscape. Also, owning a GI will indirectly encourage the improvement in product quality from the specialization and responsibilities of both farmers and exporters. This target can be achieved by approaching the market through reliable channels such as attending international trade fairs and exhibitions to introduce and promote their products, finding new opportunities to conclude contracts, and establishing a sustainable supply chain. They need to research new areas of agriculture that they can exploit, invest, and start-up, especially in the rapid growth of the world and Vietnamese economy. It is important to change their business mindset towards "living together with competition", which means considering the pressure from the competition as a driver and always find and adopt efficient solutions to innovate and develop.

Recommendations to state authorities

To support the enterprises and promote agriculture export, the Ministry of Agriculture and Rural Development needs to develop farming stimulation or quality management programs that meet the practical demands of the enterprises as well as farmers. They need to play a key role in instructing and orienting farmers, who often have less knowledge about regulations to adopt appropriate farming methods. They should implement more policies to encourage businesses to work closely with farmers who are their suppliers to upgrade the value chains. It is also crucial for the Ministry to re-plan the material areas across the country and cooperate with the Ministry of Industry and Trade to gain deeper insights into the agricultural market and indicate the prioritized farming areas for farmers and enterprises, especially the regions of GI recognition. The Trade Promotion Center for Agriculture of the Ministry needs to invest more in the promotion programs for Vietnamese agriculture and support in expanding its supply chains to the world.

The state authorities should also go hand in hand with enterprises in delivering in-depth research and information about the EVFTA. There is an abundance of SMEs which do not have sufficient resources and experts to gain insights into new EVFTA and markets. Therefore, they tend to completely rely on the government for updated information. Thus, the government can support them by investing in comprehensive research projects on specific markets and having experts analyze and interpret the EVFTA documents into detailed sectors before sending them to the enterprises. Pointing out the country's strengths and weaknesses for each group of agricultural firms is also important.

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