Journal of International Economics and Management
Journal homepage: http://jiem.ftu.edu.vn

# The potential impacts of the EVFTA on Vietnam's exports of agricultural products: an application of SMART model

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**Received:** 09 September 2020; **Revised:** 28 October 2020; **Accepted:** 19 June 2021
https://doi.org/10.38203/jiem.021.2.0028

## Abstract

The study aims to identify and analyze the impact of the European Union - Vietnam Free Trade Agreement (EVFTA) on Vietnam's exports of agricultural products. The secondary data from the World Bank and the SMART model under two scenarios are applied. The simulations suggest that the tariff elimination would result in a significant increase in Vietnam's agricultural exports. The exported value of fish products from Vietnam shows the highest increase. In one scenario, as the European Union (EU) lowers the tariff to other competing countries, Vietnam's exports of agricultural products exhibit minor reductions compared to the other scenario. Through examining the slight reduction and the revealed comparative advantage of Vietnam, it is found that crustaceans, mollusks, and other aquatic invertebrates are among the agricultural export products of Vietnam that potentially take the most advantage from the EVFTA.

**Keywords:** EVFTA, Vietnam, SMART, Agricultural exports

## 1. Introduction

Among Vietnam's trading markets, the EU is the largest one with 508 million people and a gross domestic product (GDP) of about 18,000 billion USD. Nonetheless, due to high tariff and technical barriers, Vietnam's exports to the EU remain unstable. In 2019, exports to the EU 28 reached 41.5 billion USD, which decreased from a higher level in 2018 (ITC Trademap, 2019). The EVFTA, along with its tariff reduction and non-tariff barrier alleviation, will aid to promote the EU and Vietnam cross-border trading.

On the route to realizing the vision of exporting to the EU, especially for agriculture products, both the government of Vietnam and firms have taken vigorous actions to come

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closer to this promising market. With regard to the government of Vietnam, it has increased investments in agricultural facilities and improved law enforcement related to exports. It has made easier credit access for individuals and firms in the agricultural sector. This ensured that agricultural exports would be given more facilitated customs clearance and meet quality requirements. From a firm's perspective, it has followed the government's lead, focusing on improving the unification in its supply chain and connecting with qualified farmers or suppliers. Agricultural firms have also embarked on more R&D and market research in the EU member countries to learn more about export requirements and EU citizens' preferences. Human resource is another prominent factor that has received meticulous attention from both the government of Vietnam and firms. Both the government of Vietnam and firms in the agricultural sector have been exerting great efforts in keeping up with the vision of having EU agricultural exports made in Vietnam, which has been promoted by the EVFTA in 2020.

The starting point for the EVFTA was October 2010. Following a period of preparation, the two parties officially announced the launch of the EVFTA negotiations on 26 June 2012. After nearly three years of negotiations with 14 formal sessions and many mid-term negotiations, the EU and Vietnam officially announced the conclusion of the EVFTA negotiations in December 2015. On 30 June 2019, the agreement was signed in Hanoi. This is the second FTA signed by the EU with an ASEAN member state, which was done after Singapore[2]. The FTA represents a step towards implementing policies aimed at boosting the EU's economic cooperation with the East Asian region after the failure to negotiate with the entire ASEAN bloc. On 1 August 2020, the EVFTA came into effect.

The EVFTA is an ambitious agreement. It is set to eliminate over 99% of customs duties. The EU duties on Vietnamese products will be eliminated over seven years. After this period, 99.3% of exports from Vietnam will be fully liberalized. The tariff eliminations, along with the alleviation of non-tariff measures, are expected to stimulate trading and increase export values. According to Minister of Industry and Trade of Vietnam, "The new EU-Vietnam Free Trade Agreement is hoped to raise Vietnam's export turnover to the EU market by about 20% by 2020, 42.7% in 2025, and 44.37% in 2030 compared to the case without agreement" (Hoang, 2020).

This paper focuses on the export values of different agricultural product lines under the expected changes in the tariff rate. To pinpoint the product lines that exhibit the most valuable changes, the SMART model simulation is applied for the EU and Vietnam. Then we create a point of comparison by running a second scenario, in which the EU also enacted FTAs with other potential trading partners. Previous studies have focused on specific products and showed the beneficial impacts of the agreement under the specified group. They have not shed light on which product would benefit the most in terms of added export values. By analyzing data from the SMART model simulation using export data of Vietnam's agricultural products to the EU market, we are able to explain how the EVFTA has an overall positive effect on Vietnam's agricultural export. On that basis, we show the top agricultural products that exhibit the most

[2] The bilateral trade and investment negotiations between EU and Singapore began in 2010 and completed in 2017.

benefits from the EVFTA. Furthermore, we analyze the comparative advantage of Vietnam in those products in comparison with other countries to examine Vietnam's potential of export.

The remaining parts of our paper are as follows. In Section 2, we review the past research on the impact of an FTA on its members and the impacts of the EVFTA on different industries of Vietnam. Methodology and data are discussed, along with the details of the two simulated scenarios in Section 3. The results are presented in Section 4. Section 5 presents our concluding remarks.

## 2. Literature review

### *2.1 Partial equilibrium*

Partial equilibrium analysis, which is in other words ceteris paribus, is the analysis of an equilibrium position that accounts for the changes in one or two variables and keeping all other things constant. The model has many real-life applications in predicting where economic factors will reach their equilibrium points. Johansson *et al.* (2002) suggest that partial equilibrium analysis would provide guidelines for government policies on a specific sector like agriculture. Brill *et al.* (1997) use a partial equilibrium model to analyze the effectiveness of different pricing mechanisms on the water district level. Souza *et al.* (2008) look at the empirical data to construct a partial equilibrium model for the meat market, which includes beef, poultry, and pork, in Brazil.

In analyzing trade impact, different partial equilibrium models have been applied. Vu *et al.* (2020) simulate the impact of CPTPP on Vietnam fisheries exports using the GSIM model, which stands for Global Simulation Analysis of Industry-Level Trade Policy model. The authors predict a great economic impact on Vietnam's trade flow and welfare. The paper predicts a 4.33% and a 2.3% increase in export and import value, respectively. Furthermore, the fisheries industry will see a 10.91 million USD increase in total welfare.

### *2.2 Empirical review: impacts of EVFTA on Vietnam's economy and trade*

Through studying the impact assessment of different FTAs of Vietnam, the majority of previous studies have not touched on the EVFTA. There are few pieces of research about the potential impact of the agreement. Most noticeably, limited studies have examined the trade impact on different sectors.

Philip *et al.* (2011) analyze the effect of the EVFTA at a macro level. The study used both qualitative and quantitative data. Using the Computable General Equilibrium with the GTAP model, they simulated the effect of a reduction in tariff in Vietnam. Together with an overall assessment of different trade and economic situations of Vietnam, the authors predict great potential impact not only on the trade flow of the two parties but also on investment, saving, employment, and economic growth overall. Another study simulated the EVFTA impact under the GTAP model. The study focused on the change in imports and exports of some major sectors in Vietnam. The same conclusion was made on the major positive impact of

the EVFTA on Vietnam exports. The study predicts that the agreement would generate an additional 7-8 percent of GDP above the trend growth rate until 2025 (Philip *et al.*, 2011).

On the other hand, the study of Brauer *et al.* (2014) emphasizes the negative aspects of the EVFTA, showing the difficult situation of Vietnam. The authors conclude that Vietnam will face a reduction of tariff revenues and rising competition pressure on the domestic market, and the dependency on export products with cheaper prices and import products with expensive prices from the EU can push Vietnam's trading position. In addition, by stating that the Vietnamese legal system will also have to undergo fundamental reforms until the full potential of EVFTA can unfold, this study is one of the first studies to hold a skeptical perspective about the positive impact of the EVFTA on the economy of Vietnam.

Furthermore, there have been several in-depth studies that evaluate the impact of the agreement at the industry level. Vo *et al.* (2018) analyze the impact on Vietnam's apparel export. Vu (2015, 2016) looks at the potential impact on pharmaceutical imports and automobile imports from the EU. The three studies all conclude that the EVFTA would significantly impact both Vietnam imports and exports. Through the simulated results, the apparel export of Vietnam is predicted to reach 4.220 billion USD in the next eight years (Vo *et al.*, 2018). The studies of Vu (2015, 2016) conclude that the EVFTA should significantly increase imports of pharmaceuticals and automobiles from the EU into Vietnam. This effect exhibits an increase in the welfare of Vietnam. The EVFTA should result in a 3% increase in Vietnam pharmaceutical imports and a 63.67% increase in automobile imports from the EU. The three studies utilize the WITS/SMART partial equilibrium to simulate the change in exports under the new tariff regimes. Applying the same model (SMART), Ha (2016) analyzes the opportunities and challenges of the EVFTA for Vietnam's wood processing industry. According to the simulation, in the case of tariff lines applied to HS 44 and 99 commodity codes were brought back to 0%, the trade growth value for the two commodity groups was about 307,371 USD. Regarding the agricultural sector, Nguyen and Pham (2020) study the potential impacts of EVFTA on Vietnam's exports of seafood to the EU market with the use of SMART based on the scenario where the EU eliminates tariffs on fishery products imported from Vietnam as soon as the EVFTA is in effect. According to the research, the fishery can make some trade gains with skipjack tunas, which is HS 030343, enjoying the greatest trade creation value among nine examined seafood groups. Moreover, through SMART simulation results, the EVFTA is shown to contribute to the growth of Vietnam's seafood exports, reflecting that seafood products originating from Vietnam have competitive advantages compared to those in the inland EU and other EU export partners thanks to duty-free access.

In summary, a review of the past studies in the literature pinpoints some significant research gaps. The preceding studies only assess the impacts of the EVFTA on the whole economy in general rather than on the trade of a specific sector. Regarded as one of the key export products of Vietnam to the EU, the agricultural products have not received sufficient attention from researchers. There is little study on what Vietnam's agricultural products can benefit from the agreement when the EVFTA comes into effect.

### *2.3 WITS/SMART theoretical framework*

This study adopts the partial equilibrium known as SMART, which stands for Software for Market Analysis and Restrictions on Trade. Upon reviewing past research, the SMART model has been ubiquitous in assessing the potential economics of an FTA, which is ex-ante economic evaluation. Furthermore, the results of these studies were conclusive that inference from the results of SMART simulation is beneficial for both governments and enterprises for the coming changes under the FTA. Overall, this model is proven to be appropriate for this study given its objective.

The WITS/SMART model can be used to calculate the trade flows, tariff revenue, and overall economic welfare. To model an exogenous shock of a tariff reduction, the SMART model requires five main data points: (i) The value of imports from each partner country, (ii) The tariff rate for each partner, (iii) The import elasticity of demand for each commodity, (iv) The substitution elasticity of the domestic market for each variety of commodity, and (v) The export supply elasticity for the commodity (Plummer *et al.*, 2010). With regards to the three elasticities, they are as follows:

*Notation:*

$E_m$: elasticity of import demand with respect to domestic price;

$E_x$: elasticity of export supply with respect to export price;

$E_s$: elasticity of substitution with respect to relative prices of the same product from different sources of supply;

$TC_{ijk}$: trade creation;

$TD_{ijk}$: trade diversion;

$P_{ijk}$: price of commodity i in country j from country k ;

$P_{ikj}$: price of commodity i from country k to country j;

$M_{ijk}$: imports of i by j from k;

$M_{ijK}$: imports of i by j from k;

$X_{ikj}$: Exports of i by k to j;

i: subscript denoting commodity;

j: subscript denoting domestic country;

k: subscript denoting foreign country;

K: subscript denoting alternative foreign country;

d: prefix denoting change.

#### *2.3.1 Export supply side*

The export elasticity expresses the percentage change in export associated with a one percent change in price. The formula is expressed as follows:

$$E_x = \frac{dP_{ikj}/P_{ikj}}{dX_{ikj}/X_{ikj}}$$

In the SMART model, different nations will compete to export to a home market. The model focuses on the composition and volume of imports into that home market, given the price in the export market. With respect to the export supply elasticity, there are two approaches to solve the model. We can assume either an infinite supply elasticity or an upward sloping supply curve. The former is appropriate when we are considering small exporting countries with little influence on the world market price. The latter is used when the exporting countries in consideration are large, and as a result, the world prices are endogenous factors. In this study, we view Vietnam as a small exporting country. Therefore, we have an infinitely elastic supply.

*2.3.2 Demand side*

The elasticity of import demand shows the percentage change of the aggregate import demand on a product, relative to one percentage change in price. The formula is as follows.

$$E_m = \frac{dM_{ijk}/M_{ijk}}{dP_{ijk}/P_{ijk}}$$

The elasticity of substitution expresses the consumer behaviour towards the change in prices of imported goods from different origin countries. The change in prices can occur under an import tariff change. It is express as follows:

$$E_s = \frac{d\,(\sum M_{ijk}/\sum M_{ijK})/(\sum M_{ijk}/\sum M_{ijK})}{d\,(P_{ijk}/P_{ijK}/(P_{ijk}/\sum P_{ijK})}$$

*2.3.3 Trade effect*

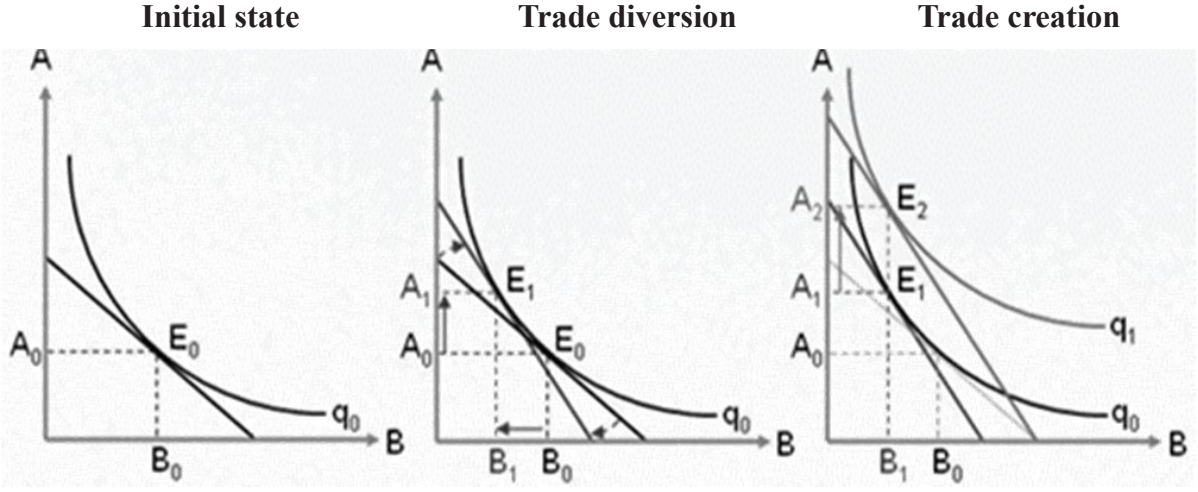


**Figure 1.** The theoretical framework of SMART

**Source:** World Integrated Trade Solution (2010)

The model provides that A and B are two partners, from which the considered market imports a good. Consumed composite quantity $q_0$ is imported from A and B. The quantity respectively imported from A ($A_0$) and B ($B_0$) is given by $E_0$, the intersection between $q_0$ and the line depicting the relative price between the two varieties.

Regarding trade diversion effect, by reducing the tariff of a good for a partner A, the relative price of A compared with B will decrease, and the relative price line gets steeper because the total consumption ($q_0$) remains the same. This leads to more import of the considered market will be diverted to country A, which is calculated using the elasticity of substitution (Laird and Yeats, 1986).

$$TD_{ijk} = \frac{M_{ijk}}{\sum M_{ijk}} \cdot \frac{\sum M_{ijk} . \sum M_{ijK} . E_S . \frac{d(\frac{P_{ijk}}{P_{ijK}})}{\frac{P_{ijk}}{P_{ijK}}}}{\sum M_{ijk} + \sum M_{ijK} + \sum M_{ijk} . E_S . \frac{d(\frac{P_{ijk}}{P_{ijK}})}{\frac{P_{ijk}}{P_{ijK}}}}$$

Regarding trade creation effect, the reduction in tariff for A will help the domestic consumer reach a higher consumption curve ($q_1$) because of an increase in imports from A. For country A, the total trade effect is made of trade diversion and trade creation. All three effects are positive for country A. There is no trade creation effect for B from a tariff reduction for A as the quantity imported from B is still $B_1$. We also apply the formula for computing the trade creation effect for country A (Laird and Yeats, 1986).

$$TC_{ijk} = M_{idk} . E_x . \frac{dt_{ijk}}{(1 + t_{ijk})(1 + \frac{E_m}{E_x})}$$

Regarding price effect, it represents the increase in the world price for this good after the tariff reduction. However, when we use the price-taker assumptions, this effect on the world price after a tariff change is always zero. The effect occurs only with a finite export supply elasticity assumption.

## 3. Methodology and data

### *3.1 Model specification*

*3.1.2 Elasticity of export supply*

The study discusses the EVFTA with Vietnam being an exporter. We assume that Vietnam is a small country with a relatively little impact on the world prices of each commodity. Therefore, the elasticity of export supply is assumed to be infinitely elastic. The WITS/SMART software set the elasticity to 99 to model the supply.

*3.1.2 Elasticity of import demand*

Within the WITS/SMART system, the elasticity of import demand for each commodity with respect to the country of origin has been empirically estimated. The calculation is made for each country and every HS 6-digit product.

*3.1.3 Substitution of demand*

In the model, SMART relies on the Armington assumption to model the behaviour of consumers. The assumption implies that commodities are differentiated by their country of origin, meaning that similar products imported from different countries are imperfect substitutes. As a result, even though an FTA entails preferential trade liberation, imports will not shift completely to the source from within the FTA (Armington, 1969). Within the software, the Armington assumption is utilized by setting the substitution elasticity to 1.5, which is the default numerical figure.

***3.2 Empirical setting and data***

*3.2.1 Empirical setting*

Following the competitive nature of agricultural products, the SMART was simulated under two scenarios. The base year for the scenarios is 2018.

Regarding Simulation scenario 1, Vietnam and the EU eliminated tariffs under the EVFTA. No further integration of Vietnam agriculture exports with other nations is taken into consideration. Tariffs are cut to 0% for all aforementioned commodity groups.

Regarding Simulation scenario 2, Vietnam and the EU eliminated tariffs under the EVFTA. At the same time, FTAs between EU and other competitive agriculture markets are in place. These markets include Australia, Brazil, Mexico, New Zealand, and Indonesia. The countries are chosen for two main reasons. First, they are competitive agriculture markets. Second, currently each nation is either negotiating an FTA with the EU or there is an FTA already being adopted/ratified but has not yet been in place. The scenario assumes that tariffs for the specified commodity groups are 0%.

*3.2.2 Data*

The World Integrated Trade Solution (WITS) in conjunction with the United Nations Conference on Trade and Development (UNCTAD) provides the partial equilibrium SMART model and its simulation tool. The information on imports required for the WITS/SMART model is extracted from the WITS database, which comes from various sources. It is in close collaboration with the (UNCTAD), International Trade Centre (ITC), United Nations Statistical Division (UNSD), and World Trade Organization (WTO).

Furthermore, the study adopts the Harmonized System (HS) classification and focuses on the effect of 14 different product lines at HS 2-digit level. These include HS code from 01 to 10, HS 17, HS 18, and HS 44. Under each level, the corresponding 6-digit level product codes will also be taken into account.

### *3.3 Revealed comparative advantage*

The SMART model will be used to simulate the changes in different trade indicators, which are mainly export value and the trade effect. From that, we can see which product line will benefit the most from trade liberalization. After that, using the RCA, the study will examine Vietnam's comparative advantage in exporting that product group, in comparison with other countries, to assess whether it is a potential export or not.

The main strength of using trade indicators is that they are relatively easy to understand. The data are easily acquired and the computation is relatively straightforward.

The Revealed Comparative Advantage index is first introduced by Balassa in his article on Trade Liberalisation and "Revealed" Comparative Advantage (Balassa, 1965). It is defined as the ratio of a country's share of the commodity in the country's total exports to the share of world exports of the commodity in total world exports. If the value of the index is more than 1, the country is said to have a revealed comparative advantage. If it is less than one, the country exhibits a revealed comparative disadvantage. The higher the RCA index is, the more efficient the country is in producing that commodity.

The RCA formula is as follows.

$$\text{Revealed Comparative Advantage}_{cg} = \frac{X_{cg}/X_c}{X_{Wg}/X_W}$$

where $X_{cg}$ is exports of good g by Country c; $X_c$ is total exports of Country c; $X_{cg}$ is world exports of good g; $X_W$ is total world exports.

The RCA index will be calculated manually using export data in 2019 from the ITC Trademap.

## 4. Results

### *4.1 SMART simulation results*

Using the SMART model with the assumed scenarios, we have achieved the following results.

**Table 1.** Change in trade indicators of agricultural exports of Vietnam to the EU in both scenarios

| Indicators | Scenario 1 | Scenario 2 |
|---|---|---|
| Initial export value (in 1000 USD) | 3,747,813.240 | 3,747,813.240 |
| Final export value (in 1000 USD) | 3,965,224.400 | 3,962,122.540 |
| Total export change (in 1000 USD) | 217,411.170 | 214,309.300 |
| Increase in export (%) | 5.80% | 5.72% |
| Trade creation effect (in 1000 USD) | 160,727.137 | 160,727.137 |
| Trade diversion effect (in 1000 USD) | 56,684.053 | 53,582.175 |
| Trade total effect (in 1000 USD) | 217,411.190 | 214,309.318 |

**Source:** The authors' calculation

Under the enactment of the EVFTA, there will be an increase of 217,411.170 USD in export value. It corresponds to a 5.80% increase in total. Overall, the export value of Vietnam's agriculture products will reach approximately 4 billion USD. The changes from a reduced tariff between Vietnam and the EU are captured when analyzing the trade effect. The total trade effect after the enactment of the agreement is approximately 217 million USD. From the view of Vietnam as an exporter, the total trade effect is the sum of the total trade creation and total trade diversion effect. They are 160 million USD and 56 million USD, respectively.

In comparison with Scenario 1, there will be a 3.1 million USD decrease in the export value of Vietnam in Scenario 2, which directly corresponds to the decline in the trade diversion effect.

Overall, there will be some reductions in the investigated indexes in Scenario 2 compared to Scenario 1. However, these reductions are insignificant. The EU's participation in FTA with Australia, Brazil, Mexico, New Zealand, and Indonesia does not affect Vietnam's export growth much. Furthermore, the trade diversion effect only accounts for only about 35% of total trade creation in both scenarios, which means that the EVFTA and other simulated FTAs only help to boost exports from the country members but have little impact on trade diversion.

**Table 2.** Change in export value of the 6 specified trading partners

| Country | Initial export value (in 1000 USD) | Export increased (in 1000 USD) | Export increased (%) |
|---|---|---|---|
| Vietnam | 3,747,813.24 | 214,309.30 | 5.72 |
| Australia | 349,576.65 | 42,515.38 | 12.16 |
| Brazil | 5,867,484.13 | 258,970.79 | 4.41 |
| Mexico | 935,141.54 | 25,440.92 | 2.72 |
| New Zealand | 1,189,870.59 | 161,228.68 | 13.55 |
| Indonesia | 1,159,433.47 | 87,752.12 | 7.57 |

**Source:** The authors' compilation

The next focus of comparison is the export situation of Vietnam and five other countries in Scenario 2. When the EU's FTAs with both Vietnam and five other competitive agriculture markets take effect, all countries will benefit. The highest increase in absolute change is in Vietnam and Brazil, but Australia and New Zealand will see the most significant relative change. This can be attributed to the relatively high tariff levels the EU sets on agricultural products from these two Oceanian countries, which are ranging from 5% to above 30% (Matthews, 2020). With trade liberalization, those products can be made cheaper, thus increasing the export potential to the EU market. For Brazil, it is the single biggest exporter of agricultural products to the EU worldwide. This makes Brazil seem to gain little in relative change when signing FTA with the EU because it has been able to produce and export agricultural commodities and value-added food products at competitive prices.

Compared to other competitors, Vietnam appears to gain little relative change. As Vietnam is already quite a large exporter of agricultural products to the EU, the relative change will

not be as striking as small-scale exporters. Therefore, Vietnam still receives advantages from FTA with the EU but not as much as other bigger exporters like Brazil, or the changes are not as impressive as smaller exporters like Australia and New Zealand.

**Table 3.** Changes in export value and the trade effect in both scenarios for the specified products in HS 2 level digits

| Product (HS code) | Initial export value (in 1000 USD) | Scenario 1 | | Scenario 2 | |
|---|---|---|---|---|---|
| | | Export value after (in 1000 USD) | Trade total effect (in 1000 USD) | Export value after (in 1000 USD) | Trade total effect (in 1000 USD) |
| 01 | 8,526.57 | 8,526.57 | 0.00 | 8,526.57 | 0.00 |
| 02 | 7,574.02 | 8,869.04 | 1,295.02 | 8,307.13 | 733.11 |
| 03 | 887,540.12 | 1,089,395.68 | 201,855.58 | 1,087,871.20 | 200,331.08 |
| 04 | 3,522.78 | 4,812.31 | 1,289.53 | 4,627.13 | 1,104.35 |
| 05 | 17,321.53 | 17,321.84 | 0.31 | 17,321.67 | 0.14 |
| 06 | 6,088.78 | 6,321.98 | 233.20 | 6,315.63 | 226.85 |
| 07 | 7,375.38 | 8,433.60 | 1,058.22 | 8,430.61 | 1,055.23 |
| 08 | 1,038,343.65 | 1,046,313.85 | 7,970.20 | 1,045,973.34 | 7,629.70 |
| 09 | 1,721,960.93 | 1,723,806.14 | 1,845.21 | 1,723,555.52 | 1,594.59 |
| 10 | 36.52 | 39.36 | 2.84 | 39.36 | 2.83 |
| 17 | 4,718.33 | 5,609.96 | 891.64 | 5,598.68 | 880.35 |
| 18 | 305.34 | 306.30 | 0.96 | 306.26 | 0.92 |
| 44 | 44,499.29 | 45,467.78 | 968.49 | 45,249.44 | 750.15 |
| Total | 3,747,813.24 | 3,965,224.41 | 217,411.19 | 3,962,122.54 | 214,309.30 |

**Source:** The authors' compilation

Product group HS 03 and HS 08 have the highest increase in export value, which is around 200 million USD and 7 million USD, respectively. This can be ascribed to the fact that the product HS 03 and product HS 08 have already been Vietnam's forte in exports, with their initial values being around 1 billion USD. Therefore, when the tariffs are lifted, the absolute growth will also be greater than other products. Furthermore, the 200 million USD increase in export value of HS 03 accounts for over 90% of the total trade effect. These figures show a huge potential for the export market of Vietnam products in HS 03, which will be further supported in the discussion below.

On the other hand, product code HS 04 has the highest relative change, with a 36.61% increase in total, which is shown in Table 6 in the Appendix. In terms of relative change, the large divergence above is due to the eradication of enormous tariff barriers that have already existed for these product lines, thus leading to a massive relative growth rate.

In Scenario 2, there is a slight decrease in exported value across all product lines, in comparison with that in Scenario 1. The product line HS 03 still shows the highest increase

in exported value. More notably, product line HS 02 will suffer the most as its export to the EU will experience the largest decline of nearly 7.5% from Scenario 1, which is shown in Table 8 in the Appendix. The trade diversion of the product exhibits a negative value of -9,630 USD. This means that, under the second scenario, Vietnam meat exports will suffer the trade diversion effect. Other countries' exports of meat will divert Vietnam's away from the EU.

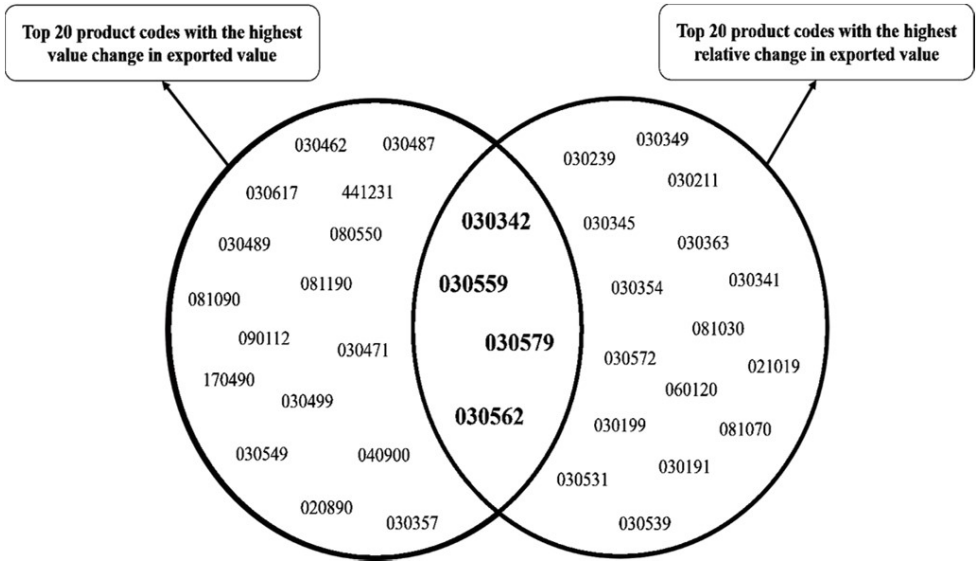


**Figure 2.** SMART simulation results in Scenario 1: top 20 products with the highest absolute value change vs. top 20 products with the highest relative change

**Source:** The authors' compilation

In the first scenario, if we look at the absolute value change of each export product group at HS 6-digit level, the biggest increase is at product group HS 030342, with a rise of 99,870.568 USD in value, which corresponds to a 583.23% increase. Under the relative change, the product code HS 030239 witnesses the highest increase of 718.98%, which is shown in Table 6 in the Appendix. This is partly due to the high tax rate of 9.25%, which is currently applied for the product group.

When comparing the top 20 highest increases in value and the top 20 relative changes, four product groups appear in both categories, which are HS 030342, HS 030559, HS 030579, HS 030562. These products are all under the group HS 03, and they critically deserve a cross-check of their importance to the economy.

Furthermore, Product code 030342 benefits the most in both scenarios in terms of both absolute and relative change, which is indicated in Tables 6 and 7 in the Appendix. It is because, in the EU, Product HS 030342 accounts for a large proportion of total imports as EU citizens considerably consume this product line. Vietnam has already exported HS 030342 to the EU and has shown great potential for export. Combined with lower prices of fish, tunas, and food stockpiling for the COVID-19 pandemic, Vietnam's potential for fish and tuna exports is quite promising there.

**Table 4.** Changes in export value of the top 10 highest product in scenario 1, in comparison with scenario 2

| Product code (HS code) | Change in scenario 1 (in 1000 USD) | Change in scenario 2 (in 1000 USD) |
|---|---|---|
| 030342 | 99,870.57 | 99,837.89 |
| 030617 | 55,155.03 | 54,741.03 |
| 030487 | 16,710.06 | 16,195.94 |
| 030462 | 11,876.67 | 11,873.66 |
| 030489 | 5,048.92 | 4,822.11 |
| 080550 | 2,893.15 | 2,614.43 |
| 030579 | 2,687.40 | 2,687.40 |
| 081090 | 2,431.53 | 2,402.72 |
| 081190 | 2,118.23 | 2,104.39 |
| 090112 | 1,441.63 | 1,319.99 |

**Source:** The authors' compilation

For the top 10 product lines that benefit the most from Scenario 1, all of them show a downward tendency when Scenario 2 occurs. HS 080550 and HS 090112 will be affected the most with a decrease of approximately 9.7% and 8.4%, respectively. This is because Vietnam is considered as a small and medium exporter of product HS 080550, which was accounting for 1.06% of the total market share in 2019. On the other hand, Mexico and Brazil are among the top 10 exporters of this product. Therefore, the tariff reduction to 0% benefits Mexico and Brazil more than it does Vietnam.

### *4.2 Implication regarding RCA*

In Section 4, our simulation results show that Product line HS 03 exhibits the highest potential for export into the EU. It is shown that, even under the simulation of other competitors, the increase of this product line still accounts for over 90% of the total trade effect of the FTA. In this section, we will examine the revealed comparative advantage index of Vietnam in the HS 03 product code under both scenarios.

**Table 5.** RCA calculation of Vietnam for the HS 03 product code

| RCA in 2019 | RCA in Scenario 1 | RCA in Scenario 2 |
|---|---|---|
| 3.555 | 3.663 | 3.660 |

**Source:** The authors' collection

It can be seen that before the EVFTA, Vietnam already exhibits a high comparative advantage in exporting products in the HS 03 group, with a relatively high RCA index, which stands at 3.555. Under both scenarios, the RCA index of Vietnam shows a slight increase. This correlates to an increase in the export strength of Vietnam in fish and aquatic invertebrates. However, in the second scenario, under competition from other countries, Vietnam's export

strength in the product shows a slight decrease compared to the first scenario. Overall, combined with our significant growth in export value under product line HS 03 in both scenarios, the major export potential is apparent even under competition from other countries. This exhibits a positive prospect in both the short term and long term for our export under HS 03.

## 5. Concluding remarks

The study analyses the impacts of the EVFTA on exporting agricultural commodities from Vietnam to the EU. Under the SMART model and two different scenarios, which are when the EU applies 0% tax only to Vietnam at the current situation and when the EU signs FTAs with five other countries, the results show that Vietnam's agricultural exports would increase in both scenarios. In both scenarios, HS 03 and 08 have the highest absolute change, while HS 03 and 04 have the highest relative change. There will, however, be some reductions in the observed variables in Scenario 2 compared to Scenario 1. Furthermore, the trade diversion effect only accounts for only about 35% of total trade creation in both scenarios, which means that EVFTA and other simulated FTAs only help to boost exports from the country members but have little impact on trade diversion. When reviewing the RCA index in HS 03 of Vietnam, it can be seen that under the EVFTA Vietnam will benefit from a higher strength of export in the product code. In addition, it can also take advantage on the benefit that the product yields even under competitive conditions.

For fisheries and aquaculture products, the EU is heavily dependent on imports from other countries around the world. The deficit trade balance has been increasing for many years, which stood at 20.78 billion EURO in 2018[3]. Moreover, the EU witnessed the highest expenditures on fish products among OECD nations, totaling 52.33 billion EURO in 2014[4]. Therefore, it can be projected that the EU will continue to grow as a huge market for the export of fish and seafood products. With the drastic tariff reduction following the EVFTA, Vietnam can enjoy great economic benefits in the export of this sector.

Among the products that have been examined under the simulations, the specific HS 030342, which include yellowfin tuna, gained the most benefit when looking into changes in export value. Yellowfin tuna is most prevalent in tropical and subtropical oceans worldwide, including the Pacific Ocean, Atlantic Ocean, and the Indian Ocean. Therefore, the majority of yellowfin tuna within the EU is imported, of which the main producing member states are Spain and France. This is expressed in a relatively modest self-sufficiency rate[5] for tuna and tuna-like products of 28%. Furthermore, when looking at the per capita consumption for tuna and tuna-like products, it can be seen that an overall increasing trend from 2015 to 2018[6]. It can be projected that the EU self-sufficiency rate for the product will see a decrease in the future. We predict that in the market with a modest self-sufficiency rate and increasing consumption for the product, an exporter such as Vietnam should see considerable benefits

[3] Data are found at EUMOFA supply balance website, available at https://www.eumofa.eu/supply-balance

[4] The data are found at OECD Stat - 2014 PPP benchmark results, available at https://stats.oecd.org/ Index.aspx?DataSetCode=PPP2014

in the future. Furthermore, due to the far distance between the countries, frozen yellowfin is among the more appropriate methods for the exportation of tuna. A great production source, a high-demand market that is reliant on imports, together with a 9.25% tariff reduction to 0% will result in a considerable export benefit of frozen yellowfin for Vietnam.

As policy implications, to take advantage on Vietnam's great benefit of the EVFTA, strict regulations, high production standards, and quality regulations of the EU should be taken into consideration.

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[5] The capacity of EU member states to meet demand from their own production, it can be calculated as the ratio of domestic production over domestic consumption

[6] Data are found at EUMOFA supply balance website, Available at https://www.eumofa.eu/supply-balance

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## Appendix

**Table 6.** SMART simulation results in scenario 1: Top 20 highest increase in absolute value and top 20 highest increase in relative value

| Top 20 in absolute value change | | | Top 20 in relative change | | |
|---|---|---|---|---|---|
| **Rank** | **Product Code (HS code)** | **Change (in 1000 USD)** | **Rank** | **Product Code (HS code)** | **Relative change (%)** |
| 1 | 030342 | 99,870.57 | 1 | 030239 | 718.98 |
| 2 | 030617 | 55,155.03 | 2 | 030211 | 652.58 |
| 3 | 030487 | 16,710.06 | 3 | 030342 | 583.23 |
| 4 | 030462 | 11,876.67 | 4 | 030349 | 504.04 |
| 5 | 030489 | 5,048.92 | 5 | 030345 | 498.63 |
| 6 | 080550 | 2,893.15 | 6 | 030562 | 372.46 |
| 7 | 030579 | 2,687.40 | 7 | 030363 | 317.05 |
| 8 | 081090 | 2,431.53 | 8 | 030341 | 308.83 |
| 9 | 081190 | 2,118.23 | 9 | 030559 | 213.87 |
| 10 | 090112 | 1,441.63 | 10 | 030354 | 185.87 |
| 11 | 030471 | 1,424.70 | 11 | 081030 | 143.61 |
| 12 | 040900 | 1,264.75 | 12 | 030572 | 127.05 |
| 13 | 020890 | 1,245.74 | 13 | 030579 | 121.13 |

**Table 6.** SMART simulation results in scenario 1: Top 20 highest increase in absolute value and top 20 highest increase in relative value *(continued)*

| Top 20 in absolute value change | | | Top 20 in relative change | | |
|---|---|---|---|---|---|
| **Rank** | **Product Code (HS code)** | **Change (in 1000 USD)** | **Rank** | **Product Code (HS code)** | **Relative change (%)** |
| 14 | 030559 | 1,022.78 | 14 | 021019 | 99.56 |
| 15 | 030562 | 891.06 | 15 | 030199 | 83.74 |
| 16 | 170490 | 888.28 | 16 | 081070 | 66.10 |
| 17 | 030499 | 876.14 | 17 | 030531 | 58.62 |
| 18 | 030549 | 838.86 | 18 | 030539 | 57.05 |
| 19 | 030357 | 733.90 | 19 | 060120 | 48.96 |
| 20 | 441231 | 712.84 | 20 | 030191 | 47.33 |

**Source:** The authors' compilation

**Table 7.** SMART simulation results in scenario 2: Top 20 highest increase in absolute value and top 20 highest increase in relative value

| Top 20 in absolute value change | | | Top 20 in relative change | | |
|---|---|---|---|---|---|
| **Rank** | **Product Code (HS code)** | **Change (in 1000 USD)** | **Rank** | **Product Code (HS code)** | **Relative change (%)** |
| 1 | 030342 | 115,249.27 | 1 | 030342 | 6730.37 |
| 2 | 030617 | 54,741.03 | 2 | 070310 | 1273.85 |
| 3 | 030487 | 16,195.94 | 3 | 020850 | 1091.89 |
| 4 | 030462 | 11,873.66 | 4 | 030329 | 996.09 |
| 5 | 030489 | 4,822.11 | 5 | 441012 | 987.60 |
| 6 | 030579 | 2,687.40 | 6 | 040790 | 981.16 |
| 7 | 081090 | 2,402.72 | 7 | 070959 | 979.03 |
| 8 | 081190 | 2,104.39 | 8 | 030771 | 969.14 |
| 9 | 418935 | 1,424.68 | 9 | 030472 | 963.81 |
| 10 | 090112 | 1,319.99 | 10 | 030759 | 956.06 |
| 11 | 040900 | 1,080.24 | 11 | 030252 | 950.00 |
| 12 | 030559 | 1,022.78 | 12 | 441810 | 899.82 |
| 13 | 030562 | 891.06 | 13 | 030811 | 877.36 |
| 14 | 170490 | 877.58 | 14 | 030211 | 652.60 |
| 15 | 030499 | 873.27 | 15 | 030349 | 499.33 |
| 16 | 030549 | 837.31 | 16 | 030345 | 496.69 |
| 17 | 020890 | 684.18 | 17 | 030562 | 372.46 |
| 18 | 030357 | 652.30 | 18 | 030363 | 317.28 |
| 19 | 441231 | 544.90 | 19 | 030341 | 305.54 |
| 20 | 030449 | 498.38 | 20 | 030559 | 213.87 |

**Source:** The authors' compilation

**Table 8.** Changes in export value and trade effect of the specified HS 2 digits' level in both scenarios

| | | Scenario 1 | | | | Scenario 2 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Product code (HS code) | Initial export value (in 1000 USD) | Export value after (in 1000 USD) | Trade Total Effect (in 1000 USD) | Trade Creation Effect (in 1000 USD) | Trade Diversion Effect (in 1000 USD) | Export value after (in 1000 USD) | Trade Total Effect (in 1000 USD) | Trade Creation Effect (in 1000 USD) | Trade Diversion Effect (in 1000 USD) | Decrease in export value from scenario 1 to scenario 2 (in 1000 USD) | Relative decrease in export value from scenario 1 to scenario 2 (%) |
| 01 | 8,526.57 | 8,526.57 | 0 | 0 | 0 | 8,526.57 | 0 | 0 | 0 | 0 | 0 |
| 02 | 7,574.02 | 8,869.04 | 1,295.02 | 742.74 | 552.28 | 8,307.13 | 733.11 | 742.74 | -9.63 | -561.91 | -7.42% |
| 03 | 887,540.12 | 1,089,395.68 | 201,855.58 | 154,218.44 | 47,637.13 | 1,087,871.20 | 200,331.08 | 154,218.44 | 46,112.64 | -1,524.48 | -0.17% |
| 04 | 3,522.78 | 4,812.31 | 1,289.53 | 524.3 | 765.23 | 4,627.13 | 1,104.35 | 524.3 | 580.05 | -185.18 | -5.26% |
| 05 | 17,321.53 | 17,321.84 | 0.31 | 0.11 | 0.2 | 17,321.67 | 0.14 | 0.11 | 0.03 | -0.17 | 0.00% |
| 06 | 6,088.78 | 6,321.98 | 233.2 | 97.74 | 135.46 | 6,315.63 | 226.85 | 97.74 | 129.11 | -6.35 | -0.10% |
| 07 | 7,375.38 | 8,433.60 | 1,058.22 | 351.46 | 706.76 | 8,430.61 | 1,055.23 | 351.46 | 703.77 | -2.99 | -0.04% |
| 08 | 1,038,343.65 | 1,046,313.85 | 7,970.20 | 3,104.13 | 4,866.08 | 1,045,973.34 | 7,629.70 | 3,104.13 | 4,525.57 | -340.51 | -0.03% |
| 09 | 1,721,960.93 | 1,723,806.14 | 1,845.21 | 986.35 | 858.85 | 1,723,555.52 | 1,594.59 | 986.35 | 608.24 | -250.62 | -0.01% |
| 10 | 36.52 | 39.36 | 2.84 | 0.92 | 1.91 | 39.36 | 2.83 | 0.92 | 1.91 | 0 | 0.00% |
| 17 | 4,718.33 | 5,609.96 | 891.64 | 285.16 | 606.47 | 5,598.68 | 880.35 | 285.16 | 595.19 | -11.28 | -0.24% |
| 18 | 305.34 | 306.3 | 0.96 | 0.43 | 0.53 | 306.26 | 0.92 | 0.43 | 0.49 | -0.04 | -0.01% |
| 44 | 44,499.29 | 45,467.78 | 968.49 | 415.35 | 553.14 | 45,249.44 | 750.15 | 415.35 | 334.8 | -218.34 | -0.49% |
| Total | 3,747,813.24 | 3,965,224.41 | 217,411.19 | 160,727.14 | 57,216.51 | 3,962,122.54 | 214,309.30 | 160,727.13 | 53,582.17 | -3,101.87 | -0.08% |

**Source:** The authors' compilation

**Table 9.** HS code used in paper

| HS Code | Description |
|---|---|
| HS 01 | Animals; live |
| HS 02 | Meat and edible meat offal |
| HS 03 | Fish and crustaceans, molluscs and other aquatic invertebrates |
| HS 030342 | Fish; yellowfin tunas (thunnus albacares), frozen (excluding fillets, livers, roes and other fish meat of heading no.0304) |
| HS 030559 | Fish; dried (whether or not salted but not smoked), n.e.s. item no. 030551 |
| HS 030579 | Fish; edible offal, other than shark fins, fish heads, tails and maws |
| HS 030562 | Fish; cod (gadus morhua, gadus ogac, gadus macrocephalus), salted or in brine but not dried or smoked |
| HS 04 | Dairy produce; birds' eggs; natural honey; edible products of animal origin, not elsewhere specified or included |
| HS 05 | Animal originated products; not elsewhere specified or included |
| HS 06 | Trees and other plants, live; bulbs, roots and the like; cut flowers and ornamental foliage |
| HS 07 | Vegetables and certain roots and tubers; edible |
| HS 08 | Fruit and nuts, edible; peel of citrus fruit or melons |
| HS 080550 | Fresh or dried lemons "Citrus lirnon, Citrus limonum" and limes "Citrus aurantifolia, Citrus latifolia" |
| HS 09 | Coffee, tea, mate and spices |
| HS 090112 | Coffee; decaffeinated, not roasted |
| HS 10 | Cereals |
| HS 17 | Sugars and sugar confectionery |
| HS 18 | Cocoa and cocoa preparations |
| HS 44 | Wood and articles of wood; wood charcoal |

**Source:** The authors' compilation