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The potential impacts of the EVFTA on Vietnam's imports of dairy products from the EU: a SMART model analysis

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Abstract

This study investigates the potential impacts of tariff elimination under the European Union - Vietnam Free Trade Agreement (EVFTA) on Vietnam's imports of dairy products from the European Union market. The SMART model, which is a simulation tool under the WITS, is employed with support data from TrendEconomy and Trade Map Database, UNCTAD's TRAINS, WTO's IDB (Integrated Data Base), and Vietnam's Ministry of Finance. The study examines two scenarios of Vietnam's tariff reduction commitments under the EVFTA and the big picture vVietnam's import value by product line and by European Union (EU) nations would increase insignificantly as the trade creation effect dominates the trade diversion. Additionally, the results indicate insignificant welfare gain for the consumers and potential revenue loss for the government. The study provides insights for Vietnam's dairy industry and policymakers to fully grasp the possible benefits and losses under the EVFTA and implications for decision-making.

Keywords: EVFTA, SMART model, Vietnam's import

1. Introduction

For years, the EU has been an important and long-standing trading partner of Vietnam. Bilateral trade has not only established strong and productive ties between the EU and Vietnam but has also created momentum for further economic growth and strategic collaboration amongst

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the regions. This impetus is to be bolstered with the implementation of the EVFTA, which is the most ambitious and comprehensive agreement between the two sides. After 10 years of negotiation (since October 2010), the EVFTA entered into force on 1 August 2020, Vietnam has demonstrated its determination in promoting deep integration into the global economy in the context when the economic and political status is complicated and predictable.

Regarding the dairy market, the EU is a key dairy exporter to Vietnam with a share of about 18% in the first 6 months of 2020 (VITIC, 2020). Under the EVFTA, Vietnam has committed to eliminate 44% of all groups of these products from day one of entry into force or after three years and the rest after five years (Jon *et al.*, 2020). Tariff liberalization is likely to have significant impacts on the value and structure of Vietnam's dairy imports and the whole sector in general as Vietnam is a top dairy importer in the world. At a higher level, Vietnam's welfare, which is dependent on the extent of trade creation relative to trade diversion, will also undergo several changes (Viner, 1950). For any government, it is of significance to be able to assess or to pre-empt the impact of any trade policy option.

In Vietnam, the impact of the EVFTA on the national economy has not been investigated by many researchers. Up to now, only a few comprehensive pieces of research have been conducted such as those by Philip *et al.* (2011), Baker *et al.* (2014). However, there is a lack of study quantifying the impact of this FTA on Vietnam's trade in dairy products, while these product groups are Vietnam's key imported goods from the EU (Delegation of the European Union to Vietnam, 2019). In this context, we conducted a research to gauge the ex-ante impacts of the tariff elimination on EU's dairy products under the EVFTA on Vietnam's trade flows, revenue, and economic welfare by using the Software on Market Analysis and Restrictions on Trade (SMART). Results from this research will be a crucial reference for the government and Vietnam's dairy enterprises to better understand the outcomes of the agreement and then make the most opportunities offered by it.

2. Literature review

2.1 Theoretical background - rationale for the SMART model

Existing studies evaluate the impacts of an FTA in two distinct ways. The ex-post assessment examines changes in trade flows after an FTA has been implemented. Ex-ante studies use trade patterns and estimate elasticity or computable general equilibrium models before the agreement enters into effect to calculate the predicted effects in a given point of time in the future when the FTA is in full application.

Cheong (2010) introduces three most common methods to foresee trade impacts of an FTA including (i) trade indicators, (ii) SMART in WITS, and (iii) the GTAP (Global Trade Analysis Project) model, which is the most widely used CGE model. Each method covers a distinct aspect of an FTA, requires specific data sources and software, and has its strengths and limitations. The first method involves using a trading indicator, which 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). According to Cheong (2010), this method is easy to implement as

data requirement is minimal and these indicators are easily constructed with an economy's trade statistics. However, it has been subject to criticism for its inability to provide precise numbers for quantifying the effects of an FTA on trade, production, consumption, or welfare. The second method, which is grounded in microeconomic theory, enables an evaluation of the economic effects of an FTA in an individual market. Its main strength is the ability to quantify changes in trade flows, tariff revenue, and economic welfare resulting from an FTA in a specific market at the most disaggregated level (Cheong, 2010; Ahmed, 2010) thus it is useful for policymakers focusing on a single commodity. Nevertheless, as being a partial equilibrium model with a focus on only one market, SMART does not account for the indirect effects of trade policy changes in other markets or the impacts on related industries. The third model and also the most commonly used among studies of ex-ante impact assessment, the CGE captures macroeconomic features and the interdependence among agents in an economic system, where trade-induced changes can be identified by simulation and a specific policy shock such as an FTA can be simulated one at a time. However, this method has its limitations: (i) it is constrained by the availability of data; (ii) it involves many parameters, which may create difficulties for estimation; and (iii) it contains assumptions or characteristics that may not reflect real-world features (Cheong, 2010). It also fails to handle disaggregated data like the SMART model (Ahmed, 2010). Based on the objective of this research, we decided to select the most appropriate method, which is the SMART model.

The idea of using the SMART model has been gaining ground among scholars over the world for years. Akinkugbe (2000) adoptes the SMART simulation, which derives from the partial equilibrium trade policy simulation model, following the approach of UNCTAD (1985), and Laird and Yeats (1986; 1987a; 1987b) to quantify the potential impacts of the EU and the Republic of South Africa FTA on Africa, Caribbean, Pacific group of states. Zhao *et al.* (2008) use the SMART model of the WITS to quantify the economic impacts of the Association of Southeast Asian Nations (ASEAN) - China Free Trade Agreement on merchandise trade flows among member countries and other trading partners. Regarding the EVFTA, by employing a partial equilibrium model, Hadjinikolov and Zhelev (2018) show that EVFTA would provide opportunities for an increase of Bulgaria's exports to Vietnam with the highest positive impact on the products from the food, chemical, and textile industries.

Researchers in Vietnam have just begun using the SMART model to foresee the FTA's impacts recently (Tu and Le, 2015; Vu, 2016; Vu and Pham, 2017; Vo *et al.*, 2018). While Tu and Le (2015) examine the potential effects of the Regional Comprehensive Economic Partnership Agreement (RCEP) on Vietnam's trade at the disaggregated level of 6-digit HS, the others focused on the impacts of the EVFTA. Vu (2016); Vu and Pham (2017) adopt the SMART model to analyze the likely impacts of tariff removal under the EVFTA on Vietnam imports of pharmaceuticals and automobiles. To identify the variation of Vietnam's apparel export and to predict some most affected products under the EVFTA, Vo *et al.* (2018) also utilize the SMART model.

After reviewing the past literature on the strengths and weaknesses of each ex-ante impact assessment method and the popularity of the SMART model among scholars, this simulation model is proven to be the most suitable method to accomplish the research's objectives.

2.2 An overview of Vietnam's dairy imports from the EU and the commitments for dairy products under the EVFTA

The dairy industry of Vietnam is dominated by the imported products which have met nearly 70% of the total domestic demand in recent years. Over the last decade, Vietnam's imports of dairy products from the world have experienced some fluctuations. Similar to the trend with the world, the value of Vietnam's dairy imports from the EU witnessed a fluctuation over the last 10 years (Figure 1). The proportion of dairy imports from the EU fluctuated wildly between 18% and 32%, which means that dairy imports from the EU accounted for around one-fifth to one-third of Vietnam's total dairy imports. Although the strengthening of trade with the EU has been at the core of the structural transformation and average tariffs are relatively low between them, with a few notable exceptions for some sensitive sectors, several measures applied by each side restrict trade in one form or another. Therefore, notwithstanding the certified high quality, nutritional value, and safety for health, the EU's dairy products are still relatively expensive for most Vietnamese.

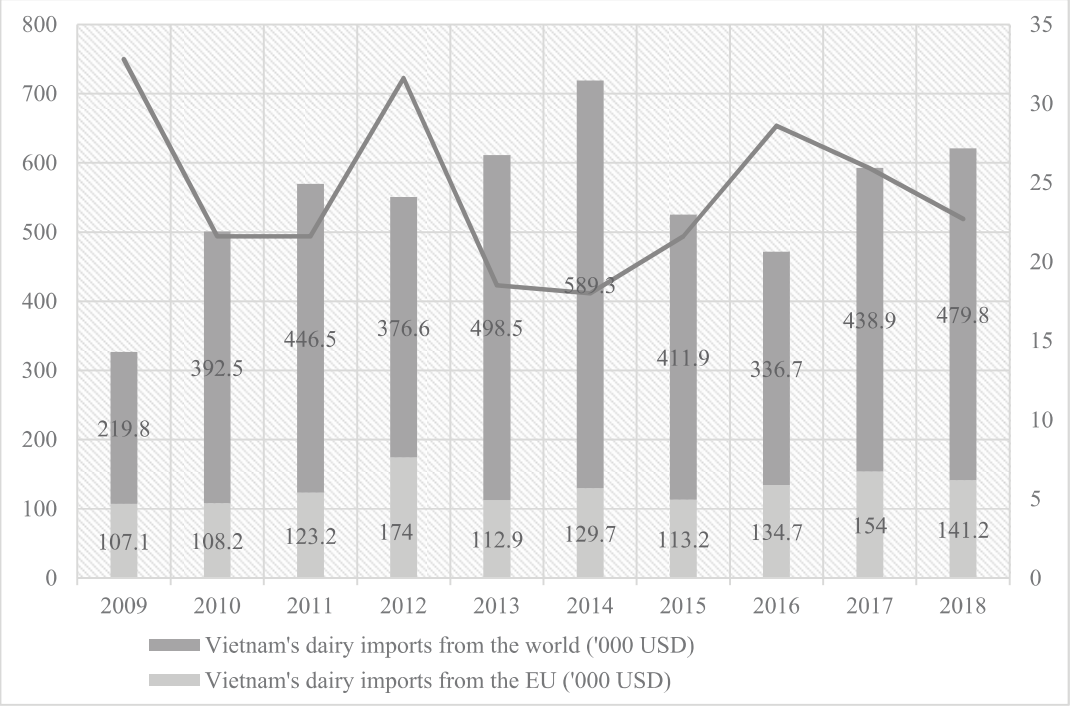

Figure 1. Vietnam's imports of dairy products during the period of 2009-2018

Source: TrendEconomy (2020)

With respect to the geographical origin of the imported dairy products, France and Germany are the two largest suppliers, of which each is accounting for more than a fifth of the total

imports of dairy products from the EU in 2018 (Table 1). The third most important source of imports is the Netherlands, making up a share of 15.8% in Vietnam's imports of dairy products from the EU. Poland was the 4th most important dairy supplier, which is responsible for 13.38% of Vietnam's total dairy imports from the EU. Eight countries on the bottom of the list have not exported their dairy products to Vietnam. There was a big disparity in Vietnam's dairy imports by the EU partner, showing that the country heavily depends on some key EU markets.

Table 1. Structure of Vietnam's dairy imports by the EU country in 2018

No	EU member states	Value (in 1000 USD)	Proportion (%)	No	EU member states	Value (in 1000 USD)	Proportion (%)
1	France	30,516	21.61	15	Latvia	157	0.11
2	Germany	30,226	21.41	16	Austria	145	0.10
3	Netherlands	22,294	15.79	17	Slovenia	54	0.00
4	Poland	18,896	13.38	18	Greece	40	0.00
5	Lithuania	12,797	9.06	19	Hungary	22	0.00
6	Belgium	7,804	5.52	20	Cyprus	2	0.00
7	Spain	5,420	3.83	21	Bulgaria	0	0.00
8	Ireland	4,328	3.07	22	Croatia	0	0.00
9	Finland	4,046	2.86	23	Estonia	0	0.00
10	Denmark	1,418	1.00	24	Luxembourg	0	0.00
11	UK	1,375	0.97	25	Malta	0	0.00
12	Italy	1,179	0.83	26	Portugal	0	0.00
13	Slovakia	296	0.21	27	Romania	0	0.00
14	Czech Rep.	185	0.13	28	Sweden	0	0.00

Source: TrendEconomy (2020)

Table 2. Vietnam's tariffs for the dairy products imported from the EU

HS	Base year 2012		2018		Tariff schedule under the EVFTA		
	Tariff lines	Simple avg tariff rate (%)	Tariff lines	Simple avg tariff rate (%)	Tariff lines in Category A (%)	Tariff lines in Category B3 (%)	Tariff lines in Category B5 (%)
0401	9	15.00	9	15.00	0.00	23.68	0.00
0402	10	6.20	13	5.00	0.00	10.52	15.79
0403	4	6.00	6	20.00	0.00	2.63	7.89
0404	2	0.00	3	1.67	5.26	0.00	0.00
0405	6	11.67	6	9.67	0.00	0.00	15.79
0406	7	10.00	7	10.00	0.00	2.63	15.79
Total	**38**	**8.15**	**45**	**10.22**	**5.26**	**39.47**	**55.27**

Source: Authors' calculation based on the EVFTA text and the Vietnamese government's decree No.125/2017/ND-CP

On 1 February 2016, the text of the EVFTA was made public for information purposes. According to Vietnam's tariff schedule, dairy products fall into three categories A, B3, and B5. 5.26% of total tariff lines belong to Category A, with the tariff rate eliminated from the date of entry into effect (Table 2). About 40% of tariff lines will be removed in four equal annual stages commencing on the date of entry into force, according to Category B3. The rest follows an eleven equal annual stage of tariff removal since the day the EVFTA comes into effect.

According to the commitments in the EVFTA, no matter which year of entry into effect, the base rates to calculate tariff reduction are Vietnam's MFN rates in effect on 26 June 2012. Regarding the second feature, the staging category will follow strictly the general provisions on the annex about "Reduction or Elimination of Customs Duties" and the Tariff Schedule of Vietnam under the EVFTA. As for the last factor, according to Article 2.5, the classification of goods in trade between the parties shall be in accordance with each party's respective tariff nomenclature in conformity with the HS. Based on the Circular No. 65/2017/TT-BTC of Vietnam's Ministry of Finance on promulgating the updated EICN to implement the Decision No. 49/QĐ-CTN dated 3 March 1998, of the President of the Socialist Republic of Vietnam on participating in the HS Convention of the WCO and the Resolution No.109/NQ-CP dated 28 December 2016, of the Government on ratifying the AHTN 2017 and the General Rules for transforming tariff schedules to conform to the EICN 2017 on the basis of the tariff selection rules specified in the Guide to transform tariff schedules in Free Trade Agreements and the Guide to transform tariff schedules of the WTO, the Table 3 below is formed to illustrate the potential Vietnam tariff reduction schedule for the dairy products under the EVFTA.

Table 3. Vietnam's tariff reduction schedule for imported dairy products from the EU at 8-digit HS (%)

Code	Y 1	Y2	Y 3	Y 4	Y 5	Y 6	Y 7	Y 8	Y 9	Y 10	Y 11
0401.10.10	11.25	7.50	3.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0401.10.90	11.25	7.50	3.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0401.20.10	11.25	7.50	3.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0401.20.90	11.25	7.50	3.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0401.40.10	11.25	7.50	3.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0401.40.20	11.25	7.50	3.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0401.40.90	11.25	7.50	3.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0401.50.10	11.25	7.50	3.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0401.50.90	11.25	7.50	3.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0402.10.41	2.25	1.50	0.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0402.10.42	2.25	1.50	0.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0402.10.49	2.25	1.50	0.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0402.10.91	4.17	3.33	2.50	1.67	0.83	0.00	0.00	0.00	0.00	0.00	0.00
0402.10.92	4.17	3.33	2.50	1.67	0.83	0.00	0.00	0.00	0.00	0.00	0.00
0402.10.99	4.17	3.33	2.50	1.67	0.83	0.00	0.00	0.00	0.00	0.00	0.00

Table 3. Vietnam's tariff reduction schedule for imported dairy products from the EU at 8-digit HS (%) *(continued)*

Code	Y 1	Y2	Y 3	Y 4	Y 5	Y 6	Y 7	Y 8	Y 9	Y 10	Y 11
0402.21.20	2.25	1.50	0.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0402.21.30	2.25	1.50	0.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0402.21.90	2.25	1.50	0.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0402.29.20	4.17	3.33	2.50	1.67	0.83	0.00	0.00	0.00	0.00	0.00	0.00
0403.29.30	4.17	3.33	2.50	1.67	0.83	0.00	0.00	0.00	0.00	0.00	0.00
0402.29.90	4.17	3.33	2.50	1.67	0.83	0.00	0.00	0.00	0.00	0.00	0.00
0402.91.00	8.33	6.67	5.0	3.33	1.67	0.00	0.00	0.00	0.00	0.00	0.00
0402.99.00	16.67	13.33	10.00	6.67	3.33	0.00	0.00	0.00	0.00	0.00	0.00
0403.10.21	5.83	4.67	3.5	2.33	1.17	0.00	0.00	0.00	0.00	0.00	0.00
0403.10.29	5.83	4.67	3.5	2.33	1.17	0.00	0.00	0.00	0.00	0.00	0.00
0403.10.91	5.83	4.67	3.5	2.33	1.17	0.00	0.00	0.00	0.00	0.00	0.00
0403.10.99	5.83	4.67	3.5	2.33	1.17	0.00	0.00	0.00	0.00	0.00	0.00
0403.90.10	2.25	1.50	0.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0403.90.90	5.83	4.67	3.5	2.33	1.17	0.00	0.00	0.00	0.00	0.00	0.00
0404.10.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0404.10.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0404.90.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0405.10.00	12.50	10.00	7.50	5.00	2.50	0.00	0.00	0.00	0.00	0.00	0.00
0405.20.00	12.50	10.00	7.50	5.00	2.50	0.00	0.00	0.00	0.00	0.00	0.00
0405.90.10	4.17	3.33	2.50	1.67	0.83	0.00	0.00	0.00	0.00	0.00	0.00
0405.90.20	4.17	3.33	2.50	1.67	0.83	0.00	0.00	0.00	0.00	0.00	0.00
0405.90.30	12.50	10.00	7.50	5.00	2.50	0.00	0.00	0.00	0.00	0.00	0.00
0405.90.90	12.50	10.00	7.50	5.00	2.50	0.00	0.00	0.00	0.00	0.00	0.00
0406.10.10	8.33	6.67	5.0	3.33	1.67	0.00	0.00	0.00	0.00	0.00	0.00
0406.10.20	8.33	6.67	5.0	3.33	1.67	0.00	0.00	0.00	0.00	0.00	0.00
0406.20.10	8.33	6.67	5.0	3.33	1.67	0.00	0.00	0.00	0.00	0.00	0.00
0406.20.90	8.33	6.67	5.0	3.33	1.67	0.00	0.00	0.00	0.00	0.00	0.00
0406.30.00	8.33	6.67	5.0	3.33	1.67	0.00	0.00	0.00	0.00	0.00	0.00
0406.40.00	8.33	6.67	5.0	3.33	1.67	0.00	0.00	0.00	0.00	0.00	0.00
0406.90.00	7.50	5.00	2.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Source: Authors' calculation based on the EVFTA text (European Commission, 2018)

3. Research methodology

3.1 Research design

To fulfill the research's objectives, quantitative research is held. The conduction of the research involves the use of SMART, a partial equilibrium modeling tool. This market access simulation package is included in the World Integrated Trade Solution (WITS) trade database and software provided jointly by the World Bank (WB) and the United Nations Conference on

Trade and Development (UNCTAD). The SMART is based on the economic theories related to import demand and export supply with three assumptions: (i) the Armington assumption, (ii) the two-stage optimization process, and (iii) the infinite export supply elasticity. The Armington assumption means that a commodity, which is defined at the HS 6-digit level, imported from one country is an imperfect substitute for that commodity imported from another country. Therefore, although an FTA goes with preferential trade commitments, it does not lead to all import demand shifting to the partner of the preferential tariff. Regarding the second assumption, the SMART model also assumes that a consumer maximizes his or her welfare through a two-stage optimization process which involves allocating expenditure by commodity and by national variety (Laird and Yeats, 1986; Cheong, 2010; Ahmed, 2010). The extent of the between-variety allocative response to a change in the relative price is defined as the substitution elasticity, which is defaulted at 1.5 in the SMART. The setup of SMART is that different nations compete to export their goods to an import market. Therefore, the SMART model assumes infinite export supply elasticity which implies that the export supply curves are flat and the world prices of each variety are exogenously given. This is called the price taker assumption, which may be suitable for the market whose import quantity is too small to change the prices of exporters. It reports the results of any trade policy shock on several variables such as trade effects, tariff revenue, customer surplus, and welfare.

Two scenarios were constructed in the SMART as follows:

Scenario 1: Vietnam only eliminates tariffs on dairy products from the EU.

Scenario 2: Vietnam eliminates tariffs on dairy products from the EU and extends the coverage of its tariff elimination to 15 countries in RCEP.

On 12 February 2020, the European Parliament ratified the EVFTA during a plenary session in Strasbourg, France. The agreement will come into force 30 days after the Vietnamese National Assembly's ratification. So the research assumes that the tariff elimination process will start in 2020 and finish in 2030. To integrate trade agreements between ASEAN nations and their major trading partners in the Asia-Pacific region into a single one, the RCEP will be the world's largest trade agreement with several tariff reduction commitments once it is signed. Therefore, Scenario 2 assumes that Vietnam will eliminate tariffs on all dairy products imported from the countries in the RCEP by 2030 like the EVFTA. The base year for both scenarios is 2018. By constructing these two scenarios, the research aims at quantifying the changes in Vietnam's imports of dairy products from the EU in the context of the EVFTA and then comparing these changes with the ones when Vietnam integrates at the highest level in both FTAs. On 31 January 2020, the UK officially stopped being a member of the EU. Following withdrawal, the UK will be outside of the territories covered by the EVFTA. However, this research assumes that the UK will be entitled to enjoy preferential trading terms in the agreement. Therefore, Scenario 1 includes 28 countries and Scenario 2 includes 43 countries.

After the impact assessment of an FTA in the SMART simulation, sensitivity analysis, and robustness test is carried out to ensure that the results obtained in the initial simulation, which is also known as the base case scenario, of the model are accurate and can be used to guide policymaking. To conduct sensitivity analysis, as done in previous studies by Thurlow and Holden (2003), Zgovu and Kweka (2009), Mugano *et al.* (2013), and Ratisai (2014), different scenarios have to be constructed using differing substitution elasticities. This analysis is required to assess the robustness of the results in the base case which is standard in the SMART model.

Table 4. Elasticities used in the sensitivity analysis

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

Source: Calculated by the authors

As shown in Table 4, the substitution elasticity of 1.5, the standard value in the SMART model, is set for the base case. The other scenarios used in the robustness tests are the lower bound, upper bound, and worst-case scenario. The testing scenarios are in line with literature that has substitution elasticity as 0.5 for the lower bound, 2 as the upper bound, and adds 4 to the upper bound to get the worst-case scenario (Thurlow and Holden, 2003; Ratisai, 2014). The export supply elasticity was maintained at 99 showing the fact that the EU is always a price taker.

3.2 Data collection method

The SMART model requires the following data which is extracted from WITS or imported from other reliable sources for the simulation of an FTA: (i) the import value of each exporting partner, (ii) the tariff imposed on each exporting partner, (iii) the import demand elasticity for the commodity, (iv) the export supply elasticity for the commodity, and (v) the substitution elasticity between national varieties of the commodity. In this research, the value of Vietnam's imports from different partners is extracted from TrendEconomy and Trade Map database. The tariff rate which Vietnam imposes on the imports of each foreign exporter is retrieved from UNCTAD's TRAINS, WTO's IDB (Integrated Data Base), and Vietnam's Ministry of Finance (Vu, 2016). The import demand elasticity defaulted in the SMART model is adopted in this paper. The research used the number 99 to illustrate the infinite export supply elasticity as Vietnam is a small importing partner of the EU and its increase in imports cannot affect the prices of goods from the EU. The EVFTA also cannot completely shift Vietnam's imports from other countries or blocs to the EU market. The substitution elasticity is valued at 1.5 as defaulted in SMART. These parameters have been commonly used in several previous studies which adopted the SMART model including Baker *et al.* (2014), Tu and Le (2015), Vu (2016), and Vu and Pham (2017).

4. Research results

4.1 Trade effects

4.1.1 Overall changes in Vietnam's imports of dairy products from the EU

Results from the simulation have shown that the value of dairy imports from the EU would go up in both scenarios, which are shown in Table 5.

An increase of 13.5% and 12.6% is a low level of increase compared to that of previous years though initially, Vietnam imposes quite high tariff rates on EU's dairy products, averaging 10.22% in 2018. In the first scenario, Vietnam's imports of dairy products would rise by 19,069.4 thousand USD corresponding to a 13.5% increase. In Scenario 2, the total import change in Scenario 2 would be 17,765.8 thousand USD, which is equivalent to a 12.6 % increase. The increase in import in Scenario 2 would be 6.8% lower than that in Scenario 1 as when Vietnam integrates with more nations, it would shift part of its dairy imports previously from the EU to other exporting partners. However, the number 6.8 suggests that this extension would not result in a big decrease in Vietnam's imports from the EU. Therefore, the EU would still be a main dairy supplier of Vietnam.

Total import increases could be decomposed into trade creation and trade diversion. Table 5 makes clear that in both scenarios trade creation effect would dominate the trade diversion effect in Vietnam which would lead to welfare gains for the country. In Scenario 1, the EVFTA would draw total trade creation effects accounting for 59.1% of total trade into Vietnam. In the other scenario when 15 countries of RCEP also receive preferential treatment like the EU member states, trade diversion effects would decline by 16%. The share of trade creation in total trade would go up from 59.1% to 63.4%. However, the difference between trade creation and trade diversion suggests that the improvement in Vietnam's welfare would not be so high.

Table 5. Overall changes in Vietnam's imports of dairy products from the EU in both scenarios

Indicators	Scenario 1	Scenario 2
Initial import value (in 1000 USD)	141,200.0	141,200.0
Final import value (in 1000 USD)	160,269.4	158,965.8
Total import changes (in 1000 USD)	19,069.4	17,765.8
Increase in imports (%)	13.5	12.6
Trade creation (in 1000 USD)	11,263.8	11,263.8
Trade diversion (in 1000 USD)	7,805.6	6,502.0
Trade creation/total import changes (%)	59.1	63.4

Source: Authors' calculation based on the SMART simulation results

4.1.2 Changes in Vietnam's imports of dairy products from the EU by country

There would be significant differences in Vietnam's import changes by nation in the two scenarios (Table 6).

Table 6. Changes in Vietnam's imports of dairy products from the EU by country

No.	Countries	Scenario 1			Scenario 2		
		Import changes (in 1000 USD)	Total (%)	Growth (%)	Import changes (in 1000 USD)	Total (%)	Growth (%)
1	France	6,500.8	34.09	21.3	6,209.0	34.95	20.3
2	Germany	4,807.1	25.21	15.9	4,487.3	25.26	14.8
3	Netherlands	2,716.5	14.25	12.2	2,426.1	13.66	10.9
4	Poland	1,400.6	7.35	7.4	1,274.8	7.18	6.7
5	Lithuania	1,018.3	5.33	8.0	926.8	5.22	7.2
6	Belgium	813.8	4.27	10.4	740.2	4.17	9.5
7	Finland	509.3	2.67	12.6	481.9	2.71	11.9
8	UK	394.1	2.07	28.7	382.5	2.15	27.8
9	Ireland	264.6	1.39	6.1	240.7	1.36	5.6
10	Italy	233.3	1.22	19.8	215.2	1.21	18.3
11	Denmark	224.5	1.18	15.8	207.6	1.17	14.6
12	Czech	111.1	0.58	60.1	101.7	0.57	55.0
13	Slovenia	31.5	0.17	58.3	28.8	0.16	53.3
14	Greece	25.4	0.13	63.5	25.4	0.14	63.5
15	Sweden	8.5	0.05	--	8.5	0.05	--
16	Slovakia	8.2	0.04	2.8	7.5	0.04	2.5
17	Luxembourg	1.6	0.00	--	1.6	0.00	--
18	Cyprus	0.2	0.00	10.0	0.2	0.00	10.0
19	Latvia	0.0	0.00	0.0	0.0	0.00	0.0
	Total	**19,069.4**	**100.00**	**13.5**	**17,765.8**	**100.00**	**12.6**

Source: Authors' calculation based on the SMART simulation results

The value of changes in imports from France would rank at the top of the list then comes Germany, Netherlands, Poland, and Lithuania which corresponds to their position in the list of initial trade value with Vietnam in 2018. The increase in Vietnam's imports of dairy products from these five countries would account for more than 86% in both scenarios. Except for Lithuania, the top four countries are also the countries that exported the highest dollar value worth of dairy products in the world. The tariff elimination would not result in an increase in Vietnam's imports of dairy products from Latvia. The SMART simulation did not generate results about changes of other nine countries due to inefficient data or no history of Vietnam's dairy imports from them.

Table 7. Trade effects by country in both scenarios

Countries	Scenario 1				Scenario 2			
	Trade creation (in 1000 USD)	Total trade effect (in 1000 USD)	Trade diversion (in 1000 USD)	Trade creation/ total trade effect (%)	Total trade effect (in 1000 USD)	Trade diversion (in 1000 USD)	Trade creation/ total trade effect (%)	
France	3,916.5	6,500.8	2,584.3	60.2	6,209.0	2,292.5	63.1	
Germany	3,153.3	4,807.1	1,653.8	65.6	4,487.3	1,334.0	70.3	
Netherlands	1,482.9	2,716.5	1,233.6	54.6	2,426.1	943.2	61.1	
Poland	691.3	1,400.6	709.3	49.4	1,274.8	583.5	54.2	
Lithuania	463.1	1,018.3	555.2	45.5	926.8	463.7	50.0	
Belgium	372.0	813.8	441.8	45.7	740.2	368.2	50.3	
Finland	347.3	509.3	162.0	68.2	481.9	134.6	72.1	
UK	287.2	394.1	106.9	72.9	382.5	95.3	75.1	
Ireland	128.8	264.6	135.8	48.7	240.7	111.9	53.5	
Italy	164.9	233.3	68.4	70.7	215.2	50.3	76.6	
Denmark	117.4	224.5	107.1	52.3	207.6	90.2	56.6	
Czech	82.7	111.1	28.4	74.4	101.7	19.0	81.3	
Slovenia	23.2	31.5	8.3	73.7	28.8	5.6	80.6	
Greece	22.0	25.4	3.4	86.6	25.4	3.4	86.6	
Sweden	4.7	8.5	3.8	55.3	8.5	3.8	55.3	
Slovakia	6.0	8.2	2.2	73.2	7.5	1.5	80.0	
Luxembourg	0.5	1.6	1.1	31.3	1.6	1.1	31.3	
Cyprus	0.1	0.2	0.1	50.0	0.2	0.1	50.0	
Total	**11,263.8**	**19,069.4**	**7,805.6**	**59.1**	**17,765.8**	**6,502.0**	**63.4**	

Source: Authors' calculation based on the SMART simulation results

The simulation shows some surprising results regarding the growth rate of Vietnam's dairy imports from the EU. France would be the only country that witnesses not only a high value of imports changes but also a high growth rate of increase, which is 21.30% in Scenario 1 and 20.3% in Scenario 2. Although the proportion of import change value of Poland and Lithuania would be high, the growth rate would stay rather low between 6% and 8% in both scenarios. Some countries would have a potentially dynamic growth rate of dairy exports to the Vietnamese market after the EVFTA is in full application despite their limited value of trade with Vietnam in this sector in the past. They include the Czech Republic, Slovenia, and Greece with a growth rate of over 50%. The growth rate of import changes from the Netherlands, Belgium, Finland, and Denmark is medium, which is close to the average value. Imports from Ireland and Slovakia would experience the slowest growth rate after the tariff elimination period. The growth rate of Sweden and Luxembourg cannot be counted as the value of initial imports of dairy products from these partners is zero.

Regarding the trade creation and trade diversion in specific, trade creation would be unevenly distributed across EU member states in both scenarios. The major contributors to trade creation would be France, Germany, and the Netherlands. In contrast, the trade created from Sweden, Slovakia, Luxembourg, Cyprus would be modest. The trend that trade creation value would exceed trade diversion value would happen in most of the countries except for Poland, Lithuania, Belgium, Ireland, and Luxembourg. Greece, Czech, Slovenia, Slovakia, and the UK are among the countries that would have the highest share of trade creation in total trade effect (between 70% and 87%). France, Germany, and Finland would have the above average share of trade creation in the total trade effect.

4.1.3 Changes in Vietnam's imports of dairy products from the EU by group of products

Changes in Vietnam's imports of dairy products from the EU would vary greatly among 4-digit HS groups, which are presented in Table 8.

Table 8. Changes in Vietnam's imports of dairy products from the EU by group of product (4-digit HS)

Code	Scenario 1			Scenario 2		
	Import changes (in 1000 USD)	Total (%)	Growth (%)	Import changes (in 1000 USD)	Total (%)	Growth (%)
0401	4,399.1	23.1	50.2	3,997.6	22.5	45.6
0402	6,683.9	35.1	9.3	6,166.9	34.7	8.6
0403	2,272.1	11.9	83.1	2,192.9	12.4	80.2
0404	659.1	3.4	2.7	651.7	3.7	2.7
0405	1,778.8	9.3	18.7	1,625.5	9.1	17.1
0406	3,276.4	17.2	13.8	3,131.2	17.6	13.2
Total	**19,069.4**	**100.0**	**13.5**	**17,765.8**	**100.0**	**12.6**

Source: Authors' calculation based on the SMART simulation results

Accounting for the largest portion of total import changes in both scenarios are Vietnam's imports of HS 0402, which would reach 35.1% in Scenario 1 and 34.7% in Scenario 2. Vietnam imports of HS 0402 from the EU would witness a significant decline in value from 6,683.9 thousand USD in Scenario 1 to 6,166.9 thousand USD in Scenario 2. It implies that when Vietnam extends its preferential tariff to 15 countries in RCEP, a large number of imports of HS 0402 will shift to these countries. This could be explained by the fact that HS 0402 has been a major imported products of Vietnam from these countries. However, the growth rate of Vietnam's imports of this group from the EU would be low for both scenarios as the initial tariff imposed on this group is low averaging 5%.

The second-largest portion of total import changes would fall into HS 0401 with 23.1% and 22.5% in Scenario 1 and Scenario 2, respectively. Vietnam's imports of this group also witnessed a high growth rate, reaching 50.2% in Scenario 1 and 45.6% in Scenario 2. The fact that Vietnam imposes a high level of tariff (15%) on products from this group may account for this impressive result.

Changes in the imports of HS 0403 from the EU would only make up for over one-tenth of total changes but would grow at the highest rate of over 80% in both scenarios. Products of HS 0403 face a very high tariff rate of 20% in the base year.

Changes in Vietnam's imports of HS 0404 would be modest in both value and growth rate in two scenarios. The low growth rate of 2.7% in both scenarios can be explained by the fact that Vietnam imposes a rather low initial tariff rate on HS 0404 averaging 1.67%. Vietnam's imports of HS 0404 would be nearly the same in both two scenarios, meaning that Vietnam's integration in RCEP would not affect its imports of HS 0404 from the EU. This comes from the fact that Vietnam's imports HS 0404 from RCEP countries are much lower than those from the EU and Vietnam eliminates tariff on HS 0404 for almost all countries in RCEP.

Vietnam's imports of HS 0405 from the EU would have the third-highest growth rate in both scenarios. The value of import changes of HS 0404, however, would be rather low due to the limited initial trade between the two sides.

Table 9 below makes clear the total import changes and the extent of trade creation relative to trade diversion by product, resulting from the tariff removal.

Table 9. Trade effects by group of products in both scenarios (6-digit HS)

Code	Scenario 1				Scenario 2		
	Trade creation (in 1000 USD)	Total trade effect (in 1000 USD)	Trade diversion (in 1000 USD)	Trade creation/total trade effect (%)	Total trade effect (in 1000 USD)	Trade diversion (in 1000 USD)	Trade creation/total trade effect (%)
0401	3,082.9	4,399.1	1316.2	70.1	3,997.6	914.7	77.5
0401.10	353.3	429.1	75.8	82.3	423.8	70.5	83.4
0401.20	2,575.2	3,482.7	907.5	73.9	3,186.6	611.4	80.8
0401.40	0.4	1.4	1.0	28.6	1.4	1.0	28.6
0401.50	154.1	485.9	331.8	31.7	385.8	231.7	39.9
0402	3,227.4	6,683.9	3456.5	48.3	6,166.9	2,939.5	52.3
0402.10	2,558.0	5,628.2	3,070.2	45.1	5,121.3	2,563.3	49.9
0402.21	512.8	853.5	340.7	60.1	853.5	340.7	60.1
0402.29	140.1	150.9	10.8	92.8	141.8	1.7	98.8
0402.91	0.5	1.9	1.4	26.3	1.9	1.4	26.3
0402.99	16.0	49.4	33.4	32.4	48.4	32.4	33.1
0403	1,776.5	2,272.1	495.6	78.2	2,192.9	416.3	81.0
0403.10	1,284.7	1,460.2	175.5	88.0	1,460.2	175.5	88.0
0403.90	491.9	811.9	320.0	60.6	732.7	240.8	67.1
0404	624.9	659.1	34.2	94.8	651.7	26.7	95.9
0404.10	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0404.90	624.9	659.1	34.2	94.8	651.7	26.7	95.9
0405	664.4	1,778.8	1114.4	37.4	1,625.5	961.1	40.9
0405.10	468.5	1,237.8	769.3	37.8	1,237.8	769.3	37.8
0405.20	23.5	39.8	16.3	41.0	39.8	16.3	41.0
0405.90	172.3	501.2	328.9	34.4	347.9	175.6	49.5
0406	1,887.7	3,276.4	1388.7	57.6	3,131.2	1,243.5	60.3
0406.10	402.0	820.0	418.0	49.0	678.2	276.2	59.3
0406.20	181.2	373.4	192.2	48.5	373.0	191.8	48.6
0406.30	358.0	669.5	311.5	53.5	667.0	309.0	53.7
0406.40	9.9	10.0	0.1	99.0	9.9	0.0	100.0
0406.90	936.6	1403.5	466.9	66.7	1,403.1	466.5	66.8
Total	**11,263.8**	**19,069.4**	**7,805.6**	**59.1**	**17,765.8**	**6,502.0**	**63.4**

Source: Authors' calculation based on the SMART simulation results

It is also important to identify the non-member countries, whose trade is being diverted to the EU as a result of the tariff liberalization under the EVFTA. Table 10 provides a list of top non-member countries that would suffer the most.

Table 10. Top countries suffering from trade diversion in Scenario 1 (Unit: in 1000 USD)

No.	Countries	Trade diversion effect
1	New Zealand	-3,514.0
2	U.S.	-2,283.3
3	Australia	-1,317.2
4	Uruguay	-202.9
5	Thailand	-149.2
6	Malaysia	-111.4
7	Singapore	-81.4

Source: Authors' calculation based on the SMART simulation results

As shown in Table 10, New Zealand would be the most adversely affected country, followed by the US, Australia, and Uruguay if the EVFTA were fully enacted. These other three countries would be Southeast Asian countries that have already received preferential treatment as a result of the FTA with Vietnam. All these nations are also the biggest exporters of dairy products for the Vietnamese market.

4.2 Revenue effects

Table 11 shows the revenue losses from the tariff removal in two scenarios.

Table 11. Revenue loss (Unit: thousand USD)

Code	Revenue loss	
	Scenario 1	Scenario 2
0401	-1,412.5	-2,537.6
0402	-3,839.6	-4,878.7
0403	-1,031.0	-1,092.1
0404	-32.1	-56.3
0405	-943.9	-3,324.1
0406	-2,101.4	-2,286.3
Total	-9,360.5	-14,175.1

Source: SMART simulation results

The majority of member states within an FTA consider fiscal revenue to be a major concern when signing an FTA as the tariff liberalization will have harmful effects on the economy due to revenue losses. These losses emanate from the decline in the import tariffs and taxes. According to the SMART simulation results, the possible fiscal revenue loss implications for

Vietnam would amount to 9360.5 thousand USD in Scenario 1 and 14,175.1 thousand USD in Scenario 2. The possibly most affected by losses would be HS 0402 worth 3.8 million USD in Scenario 1 and 4.8 million USD in Scenario 2. The second group of products with revenue losses would be HS 0406, which is worth around 2.2 billion USD in both scenarios. Revenue losses from HS 0404 would be the lowest as they initially face a low level of tariff.

The total revenue loss in Scenario 2 would be 1.5 times as high as that in Scenario 1. Revenue loss from tariff elimination on HS 0401, HS 0402, and HS 0405 would increase remarkably when Vietnam integrated with more nations. In contrast, revenue loss on HS 0403, HS 0404, and HS 0406 would go up insignificantly.

4.3 Welfare effects

Welfare effect is defined as the benefits consumers in the importing country derive from the lower domestic prices after the removal or reduction of tariffs. Table 12 reveals results on Vietnam's welfare by group code and for all groups as one aggregate in both scenarios.

Table 12. Welfare effect (Unit: thousand USD)

Code	Welfare effect	
	Scenario 1	Scenario 2
0401	187.9	250.5
0402	99.0	149.8
0403	64.5	66.2
0404	24.5	37.8
0405	13.4	43.4
0406	73.9	76.6
Total	463.2	624.3

Source: SMART simulation results

The simulation results reveal that Vietnam would experience benefits in consumer welfare of 463.2 thousand USD through tariff removal on the dairy products imported from the EU and of 624.3 thousand USD through extending the tariff removal to imported dairy products from RCEP countries. The total gains realized in the two scenarios are seen to be insignificant as they represent only 0.18% and 0.25%, respectively, of Vietnam's GDP as at 2018, which stood at 245.2 billion USD (World Bank, 2019). HS 0401 would have the highest consumer welfare effects valued at 187.9 thousand USD in Scenario 1 and 250.5 thousand USD in Scenario 2 (Appendix 1). This was followed by HS 0402, which is worth 99 thousand USD and 149.8 thousand USD. It is significant to note that the order of products generating welfare effects would be different from that of products generating trade effects.

The welfare effects resulting from tariff removal for all groups in Scenario 2 (Appendix 1) would be higher than that in Scenario 1, which implies that the more tariff Vietnam removes, the more welfare effects it benefits from. The difference between the welfare effects in the two

scenarios would be significant for HS 0401, HS 0402, and HS 0405. This may indicate that HS 0401, HS 0402, and HS 0405 are major products Vietnam imports from RCEP countries. For HS 0403, HS 0404, and HS 0406, the extension of tariff removal would only result in small increases in welfare effects.

4.4 Sensitivity analysis and robustness test

We created two different scenarios with different elasticity values under which the SMART model was re-run to check the robustness of the results of the base case. Results are presented in Table 13.

Table 13. Sensitivity analysis and robustness test using different elasticities

Impacts	Scenario 1			
	Base case	**Lower bound**	**Upper bound**	**Worst case**
Total import changes	19,069.4	19,069.4	19,069.4	19,069.4
Trade creation	11,263.8	11,263.8	11,263.8	11,263.8
Revenue effect	-9,360.5	-9171.0	-9455.6	-10,234.6
Welfare effect	463.2	467.7	461.2	443.6
	Scenario 2			
Total import changes	17,765.8	17,765.8	17,765.8	17,765.8
Trade creation	11,263.8	11,263.8	11,263.8	11,263.8
Revenue effect	-14,175.1	-14,030.0	-14,247.8	-14,834.9
Welfare effect	624.3	627.6	622.6	609.6

Source: Authors' calculation based on the SMART simulation results

From the results in Table 13, the percentage changes of these values given different substitution effects are calculated as follows:

% change = (Base case value-Scenario value)/(Base case) x 100

Table 14. Percentage changes of scenario simulations from the base case (Unit: %)

Impacts	Scenario 1			Scenario 2		
	Lower bound	**Upper bound**	**Worst case**	**Lower bound**	**Upper bound**	**Worst case**
Total import changes	0	0	0	0	0	0
Trade creation	0	0	0	0	0	0
Revenue effect	2.02	1.01	9.33	1.01	0.51	4.65
Welfare effect	0.97	0.43	4.23	0.52	0.27	2.35

Source: Authors' calculation based on the SMART simulation results

According to Table 14, the substitution elasticity valued at 0.5 for the lower bound, 2 for the upper bound, and 6 for the worst case would result in no change in trade creation and total changes in imports from the base case.

The lower bound of 0.5 would reduce the revenue loss by 189.5 thousand USD in Scenario 1, which is corresponding to a 2.02% reduction, and 145.1 thousand USD in Scenario 2, which is corresponding to a 1.01% reduction. The worst case of 6 would result in an increased revenue loss of 874.1 thousand USD, which is a 9.33% increase, in Scenario 1 and of 659.8 thousand USD, which is a 4.65% increase.

According to Table 14, the opposite trend would occur in the welfare effect when changing the substitution elasticity. Lowering to 0.5 would lead to an increase in welfare effects and increasing to 2 and 6 would lead to welfare decreases. As shown in Table 13, the changes in welfare effects would be minimal in relative terms.

In short, the changes in the value of impacts when using different substitution elasticities would be insignificant. Therefore, the base case is considered robust.

5. Conclusion and recommendations

This study aims at quantifying the potential impacts of the tariff elimination under the EVFTA on Vietnam's imports of dairy products. To fully capture these impacts at a disaggregate level, the study makes use of the SMART, which is a simulation tool included in the WITS. Two scenarios are constructed which are based on Vietnam's tariff reduction commitments under the EVFTA and the broad picture of the ongoing integration of the nation in the dairy sector with RCEP countries.

The findings show that in Scenario 1, Vietnam's imports of dairy products from the EU would increase by 13.5%, which is insignificant compared to the level of increase in the previous years. In the scenario, the figure is 12.6%, which suggests that Vietnam's integration with the RCEP countries would only slightly affect its dairy imports from the EU market. In other words, the EU would be one leading dairy exporter for Vietnam. Trade creation would be unstable and exceed the trade diversion in both scenarios. The extent of trade creation and trade diversion implies that Vietnam's welfare gains would be insignificant, which is clarified in Table 12. France, Germany, Netherlands, Poland, and Lithuania are the top countries from which Vietnam would increase its dairy imports. Regarding the product groups, HS 0401 and HS 0402 would be the top groups to be imported when the tariff was fully eliminated in both scenarios. The tariff elimination would also result in revenue losses and divert trade of some top dairy exporters for Vietnam away.

In light of these results, the following recommendations are drawn for Vietnam to make the most advantages and overcome the disadvantages that the EVFTA brings. Vietnam's political leaders should make amendments to trade policies so that they are in accordance with the country's current context and its commitments in the EVFTA and improve the efficiency of adopting these policies. First, the Ministry of Industry and Trade should complete and publish the "Plan to implement the EVFTA of the government" which acts as a guideline for other ministries, industries, and local authorities to construct their plans to implement the agreement. Second, it is of significance to complete the program to implement technical barriers to trade (TBT) in accordance with the WTO's regulations to not only protect the nation's benefits

but also promote the competitiveness of domestic enterprises and commodities. When the dismantling of tariff barriers does not go with effective TBT, Vietnam faces a possibility of becoming a potential market for the low-quality products that exert detrimental impacts on consumer's health and domestic production.

There is a need for the Vietnamese government to adjust the structure of revenue sources to offset the revenue loss resulting from the tariff elimination. The results from the SMART analysis already capture this loss to some extent. The agreement will also lead to the reduction in the government revenue from the value-added tax (VAT) and excise tax on imported goods as the calculation of these two kinds of tax is based on the price of goods including the customs duties. The VAT and excise tax on domestic products may also experience a downward trend as the reduction in foreign products due to the tariff removal promotes the customers' spending on them; thus decreases the consumption of domestic products. The fact that the tariff removal on these products will be implemented progressively is a useful measure to soften the loss in tariff revenue. To mitigate further revenue loss, the government may need to consider domestic consumption tax such as excises on particular goods and general sales tax.

The government needs to develop mechanisms and policies to support dairy enterprises. These will equip them with incentives to improve their competitiveness in a tough competition with several dairy giants from the EU.

The government in collaboration with the ministries should regularly inform all the content of the EVFTA, opportunities, and challenges for Vietnam, and a specific plan to implement it on both online and offline platforms. Broadcasts on national's TV channels, publications such as articles, reports, and studies should be promoted.

The Vietnam Dairy Association (VDA) is a social-professional association that involves the optional participation of firms, farms, families raising cows, and specialists in manufacturing and processing dairy products. It is necessary that the VDA should equip the dairy firms with information relating to the EVFTA. Some activities such as conferences, workshops, and seminars for the enterprises to exchange and resolve all their concerns about the EVFTA should be held regularly and timely. Not only the EVFTA, but the association should also consult and provide its members with knowledge about international business laws, international economic integration, and experiences to resolve international commercial disputes through publications and posts on its website about the EVFTA and the EU market. The association also needs to answer the enterprises' questions about the EVFTA and relevant government policies.

In the context of the EVFTA, the VDA should be a more effective bridge between firms and government agencies in the industry. The association should help to deliver directions of the government and the ministries to the dairy enterprises and develop them into detailed plans. In return, it should collect and examine the ideas of its members on the EVFTA and then communicate them with government agencies. This strong network will help domestic production to tackle difficulties and compete with foreign brands when almost all the trade barriers for protecting them are eliminated.

The EVFTA stands as an opportunity for the EU's dairy firms to dominate the Vietnamese market as several countries in this bloc are the world's top dairy exporters. The VDA should collaborate with domestic dairy firms to underpin their highly competitive positions in the domestic market. Firstly, it should support the firms' needs for the best and most recent business and technical information and advice. Secondly, research within the field of animal care, antimicrobial resistance, and farming practices should be undertaken to equip them with the measures to improve products' quality. Moreover, it should support its members in developing and adopting state-of-the-art facilities and technology in manufacturing and distributing its products.

Knowing the rules is vital for any business to enter a game. Vietnam's dairy companies, without exception, must get a better understanding of the EVFTA. Figuring out these insights requires great visibility courtesy of data and analytics. The dairy firms can get these insights from their resources or get help from the VDA. They will provide stability and predictability and allow them to make strategic decisions across innovation, marketing, pricing, and assortment in both the short-term and long-term future. It is also essential that the dairy companies organize meetings and training programs to facilitate their employees with this information and the company's strategies. Any difficulty arising from an understanding of the EVFTA or developing adaptation strategies should be immediately communicated to the VDA or other authorities so that they can jointly resolve it.

Minimizing the price of dairy products, while optimizing output and quality is also the basis upon which the Vietnamese dairy enterprises win customers in the home market in the future. To maintain their competitive advantage in the context of the heightened level of competition, the domestic dairy companies should concentrate their effort and resources in three main areas: improving all steps in their product line, investing in modern technology and facilities in the whole supply chain, and enhancing the quality of human resources.

To survive in harsh competition, the dairy industry also ought to form a strong network that combines the strengths of all entities to proactively overcome upcoming challenges together. The share of knowledge and experience among them will be the glue to consolidate the network. Therefore, with the guidelines of the government and the association, the support spirit among the domestic dairy enterprises will turn the EVFTA into a win-win game.

The research is one of a few studies that pre-empts the impacts of the tariff liberalization under the EVFTA on Vietnam's imports at a disaggregated level. The research makes both empirical and practical contributions to the existing literature. Empirically, the research exploits the TrendEconomy's data on import value and tariff faced by each exporting partner and parameters in the SMART model to examine how the tariff removal will affect Vietnam's imports of dairy products from the EU. The research will be a foundation for future studies that take into account the impacts of both tariff and non-tariff barrier elimination on Vietnam's imports of dairy products from the EU and the whole dairy industry. From a practical perspective, based on a careful reading of the EVFTA especially the chapter on commitments to reduce tariffs on dairy products and grounded on the use of well-tested analytical tools, this

assessment provides an important input for policymakers in all management levels to grasp the most opportunities of the FTA.

Although the research contributes important quantitative results on the trade and tariff revenue effects of the EVFTA at the most disaggregated level of trade data, some limitations should be noted which raise the possibility of future studies. First, the choice of methodology leads to some limitations derived from the nature of a partial equilibrium approach. It is static by nature, allowing only for a comparative static comparison of pre- and post-policy change when all the other variables are held constant which is an oversimplification of the real world. The results are limited to the direct effects of an FTA in a single market. Therefore, the SMART simulation ignores the inter-industry effects and the feedback effects. SMART also does not return results on an FTA's effects on domestic production, which may be of interest to several policymakers. Furthermore, SMART does not account for the possibility of new foreign exporting sources. Finally, SMART's results may be sensitive to the modeling assumptions and parameter values used. The research uses the defaulted parameter values in SMART which were provided by the World Bank. These values may be less reliable for developing countries like Vietnam. Therefore, future studies can perform it manually by replacing these parameters with more accurate or reasonable ones. Second, this research uses data on trade and tariffs from TrendEconomy, TRAINS, and WTO to run the SMART simulation, which may be less reliable and timely in the case of developing countries. Accordingly, to improve the results' reliability, future studies may seek data from various sources of their own countries to replace or complement the WITS trade and trade-barrier data. Third, the research provides helpful results on the impacts of tariff barrier removal under the EVFTA and contributes some suggestions for Vietnam. However, an FTA also deals with non-tariff barriers which may make much greater impacts on the whole sector. Future studies may provide more novel insights and precise policy prescriptions for this sector by examining the impacts of non-tariff barrier elimination. Fourth, the economic analysis presented in this research cannot match the complexity of such an agreement in the context of COVID-19. Due to the effects of the COVID-19 pandemic, many countries including the EU member states are suffering from serious economic losses. Therefore, the EVFTA's effects may not be as large as this quantification. Taking the effects of the pandemic into account when quantifying the impacts of the EVFTA can be an avenue for future research.

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Appendix 1. Countries in two scenarios

No.	Code	Countries	
		Scenario 2	**Scenario 1**
1	040	Austria	Austria
2	056	Belgium	Belgium
3	100	Bulgaria	Bulgaria
4	191	Croatia	Croatia
5	196	Republic of Cyprus	Republic of Cyprus
6	203	Czech Republic	Czech Republic

Appendix 1. Countries in two scenarios *(continued)*

No.	Code	Countries	
		Scenario 2	**Scenario 1**
7	208	Denmark	Denmark
8	233	Estonia	Estonia
9	246	Finland	Finland
10	250	France	France
11	276	Germany	Germany
12	300	Greece	Greece
13	348	Hungary	Hungary
14	372	Ireland	Ireland
15	380	Italy	Italy
16	428	Latvia	Latvia
17	440	Lithuania	Lithuania
18	442	Luxembourg	Luxembourg
19	470	Malta	Malta
20	528	Netherlands	Netherlands
21	616	Poland	Poland
22	620	Portugal	Portugal
23	642	Romania	Romania
24	703	Slovakia	Slovakia
25	705	Slovenia	Slovenia
26	724	Spain	Spain
27	752	Sweden	Sweden
28	826	UK	
29	096	Brunei	
30	116	Cambodia	
31	360	Indonesia	
32	418	Laos	
33	458	Malaysia	
34	104	Myanmar	
35	608	Philippines	
36	702	Singapore	
37	764	Thailand	
38	036	Australia	
39	156	China	
40	392	Japan	
41	410	Korea	

Source: Authors' compilation