RESEARCH

An Application of the SMART Model to Assess Impacts of the EVFTA on Vietnam's Imports of Automobiles from the EU

Vu Thanh Huong[*], Pham Minh Tuyet

VNU University of Economics and Business, 144 Xuan Thuy Str., Cau Giay Dist., Hanoi, Vietnam

Abstract: This paper assesses the potential impacts of the European - Vietnam Free Trade Agreement (EVFTA) on Vietnam's imports of automobiles from the EU by adopting the Software on Market Analysis and Restrictions on Trade (SMART) based on two scenarios. The simulation results reveal that the EVFTA would result in a significant increase in Vietnam's automobile imports from the EU, implying that the EU would be still among the biggest car sources for Vietnam in the upcoming time. However, when Vietnam also extends its coverage of tariff elimination to ASEAN+3, the reduction in Vietnam's automobile imports from the EU would be considerable. Another important finding is that an uneven distribution in Vietnam's additional automobile imports from the EU by nation, automobile group and automobile product would occur when the EVFTA comes into effect. In both scenarios, trade creation effects are higher than trade diversion effects and hence, the EVFTA could raise the welfare of Vietnam. Based on these results, the paper ends by drawing out some implications for the Vietnamese government and domestic enterprises to be better prepared for the upcoming ambitious EVFTA.

Keywords: Vietnam, EU, EVFTA, ASEAN+3, automobiles, SMART.

1. Introduction

With a large population of more than 94 million people, a high economic growth rate, large market size and increasing income per capita, Vietnam has become a lucrative car market in the region. In 2015, total automobile sales in Vietnam were nearly 245,000 units, equivalent to an increase of 55% compared to the sales level in 2014 [1]. The sales in 2016 continue increasing by 24% to reach a peak of more than 300,000 units [2]. The car industry has over time contributed considerably to Vietnam's GDP and employment creation. In

Vietnam's automobile industry development strategy and master plan for 2025 with a vision to 2035, Vietnam sets up the objective to build up the automobile sector into a key industry that will not only meet the domestic demand but also create a motive force to promote the development of other manufacturing industries. In spite of the perceived important role of the car industry in Vietnam's economic development, domestic automobile production has developed slowly and met only about 40% of total domestic demand while Vietnam's consumption of the intermediate and upper car classes has strongly expanded, especially for luxury cars made by the European Union (EU) such as Volkswagen, BMW, Mercedes and Jaguar.

_____
[*] Corresponding author. Tel.: 84-977917656.
  Email: huongvt@vnu.edu.vn

The EU has been an important and strategic trade partner of Vietnam. After more than 3 years of negotiation, Vietnam and the EU signed the Declaration on the conclusion of EVFTA negotiation on 2nd December 2015. On 1st February 2016, the full text of the agreement was officially announced. The way ahead now for both parties is to conduct a legal review, translate the EVFTA into the EU's official languages and Vietnamese and approve and ratify the agreement [3]. According to the EVFTA commitments, Vietnam's import tariffs on automobiles will be eliminated in 10 years. As the EU is among Vietnam's largest car import markets, tariff on automobiles imported from the EU is now very high, and the domestic automobile industry in Vietnam has slowly developed, this tariff elimination is likely to affect considerably Vietnam's car imports and industry.

On these grounds, this paper, by adopting the SMART model, aims at assessing impacts of tariff elimination under the EVFTA on Vietnam's imports of CBU (Completely Built-Up) automobiles[1] from the EU and provides some suggestions for Vietnam to better prepare for the EVFTA.

2. Overview of Vietnam's automobile imports from the EU

Generally, during the period 2001-2015, CBU automobile imports of Vietnam from the EU countries have witnessed an upward trend. The imports have increased by six times, from USD 28 million in 2001 to about USD 172 million in 2015 (Figure 1). More closely, following a significant growth in the period 2006-2011, there was a decline in 2012 to just around USD 72 million. Then, from 2013 to 2015, the imports have consistently increased and finished at a peak of more than USD 172 million in 2015.

However, the proportion of Vietnam's car imports from the EU has declined from 2013 to attain only 7.3% in 2015 despite the fact that the EU has been still among the largest car import markets of Vietnam. This relative reduction can be explained by the dramatic increase of Vietnam's car imports from the ASEAN countries such as Thailand and Indonesia, and other ASEAN partners countries such as Korea, China, India and Japan to take advantage of preferentials in ASEAN-related FTAs.
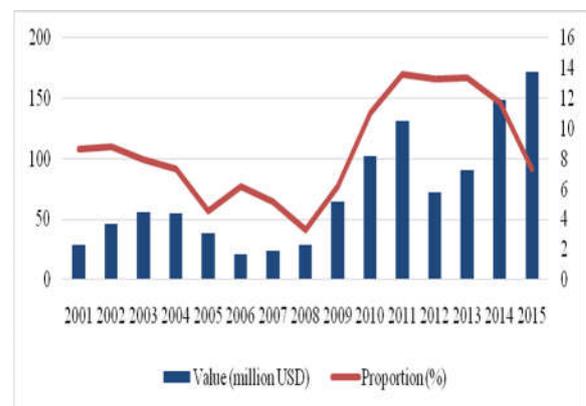

Figure 1. Vietnam's automobile imports
from the EU, 2001-2015.
Source: International Trade Center database.

Vietnam has relied on several of the automobile markets in the EU. Germany has been the leading exporter of automobiles to Vietnam, accounting for more than half of the total exports of the EU to Vietnam (Figure 2). The second biggest share belongs to the UK with over 17%, followed by France, Finland and Hungary with 6.36%, 4.85% and 4.21%, respectively. The remaining countries of the EU have taken up a small proportion of around 3%.

Vietnam imports from the EU three main groups of automobiles including HS 8703 (Motor cars and other motor vehicles principally designed for transport of people), HS 8704 (Motor vehicles for the transport of goods) and HS 8705 (Special purposes motor vehicles). Among these, HS 8703 is the most imported group with 89% of Vietnam's total

---

[1] A CBU automobile means a car is completely built out of the country and imported to the country as a whole piece. It is different from a CKD automobile, which is assembled locally using all the major parts, components, and technology imported from the country of its origin.

automobile imports from the EU (Figure 3). Ranking second is HS 8705 with nearly 8%. The majority of automobile imports are medium sized cars (of cylinder capacity exceeding 1500cc but not exceeding 3000cc), large sized cars (of cylinder capacity exceeding 3000cc), trucks and vans. As a result, similar to the import structure of the EU nations, the import structure by automobile group has been at low diversity.

3. Vietnam's commitments on automobile tariff elimination under the EVFTA

The tariff rates Vietnam has imposed on CBU automobiles from the EU were quite high and stable throughout the period 2012-2016. From 2012 to 2016, the tariff lines at 0% stayed the same, accounting for only 12.58% of the total. The average tariff rate for all groups of automobiles remained at 37.97% (Table 1), which is much higher than the average tariff of 11.97% Vietnam has imposed on all imports from the EU in the base year [4].

In general, the tariff rate Vietnam has imposed on HS 8705 is the lowest among the three automobile groups, at about 3.33% while the rate on HS 8703 (the most imported group) is at the highest at 61.56%. The remaining group HS 8704 is protected with a tariff rate of approximately 17.69%.
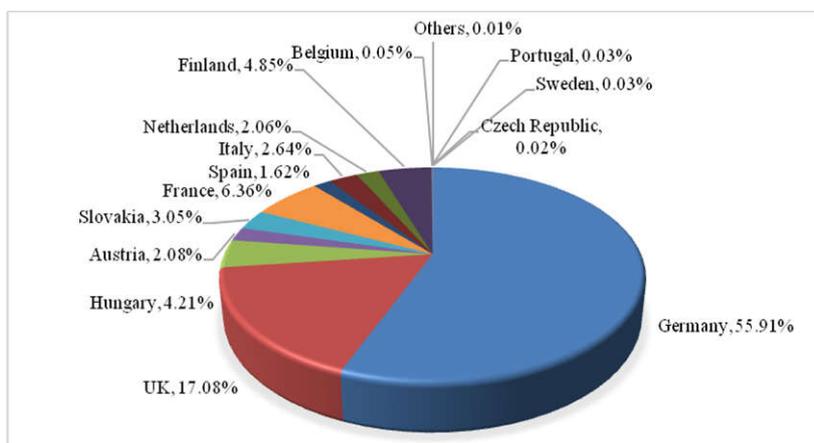

Figure 2. Vietnam's automobile imports by the EU nation in 2015.
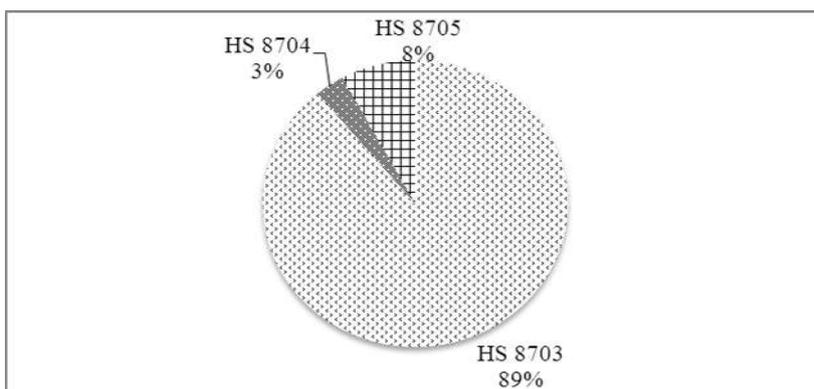*Source:* International Trade Center database.

Figure 3. Vietnam's automobile imports from the EU by automobile group in 2015.
Source: International Trade Center database.

Table 1. Vietnam's tariffs on automobiles imported from EU

HS Code	Number of tariff lines	Base year 2012		2016		Tariff reduction schedule under the EVFTA		
		Number of tariff lines at 0%	Simple average tariff rate (%)	Number of tariff lines at 0%	Simple average tariff rate (%)	Tariff lines in schedule A (%)	Tariff lines in schedule B9 (%	Tariff lines in schedule B10 (%)
8703	64	0	61.56	0	61.56	0.00	11.32	28.93
8704	89	16	17.69	16	17.69	10.06	0.00	45.91
8705	6	4	3.33	4	3.33	2.52	0.00	1.26
Total	159	20	37.97	20	37.97	12.58	11.32	76.1

Source: Authors' calculations from Vietnam's tariff schedule in the EVFTA.

According to Vietnam's tariff schedule under the EVFTA, automobile tariff reductions are classified into three main groups: A, B9, and B10 with the base tariff rates of the negotiated year 2012 (Table 1).

Accordingly, 12.58% of all automobile tariff lines are put under Schedule A, where tariff rates shall be eliminated immediately after the EVFTA enters into force (Table 1). It is important to note that Schedule A includes all the tariff lines that were already at a 0% rate in the base year and almost all are automobiles for the transport of goods (HS 8704) of gross weight exceeding 20 tonnes such as garbage collection trucks, refrigerated lorries, tanker trucks, armored cargo lorries and hook-lift lorries.

11.32% of all tariff lines fall into Schedule B9, where tariff rates shall be eliminated in ten years beginning on the date the EVFTA comes into force. These types of automobiles are mainly those designed for transport of people (HS 8703) such as ambulances and cars with a cylinder capacity exceeding 3,000cc.

The highest tariff line, which is 76.1%, is categorized in Schedule B10 to be removed in eleven equal annual stages starting from the date the EVFTA comes into effect. These types of automobiles are motor vehicles for transportation of people (HS 8703) not exceeding 3,000cc and for transportation of goods (HS 8704) of gross weight not exceeding 5 tonnes.

4. Methodology and data

4.1. Methodology

The SMART is known as a partial equilibrium model that can be used in assessing the trade, tariff revenue, and welfare effects of a FTA. This model and the simulation tools are part of the World Integrated Trade Solution (WITS) database and software suite provided jointly by the World Bank and the United Nations Conference on Trade and Development. The strengths of the model are that it is easily implemented together with the WITS database, it yields important quantitative results on the trade and tariff revenue effects of an FTA, and the analysis can be performed at the most disaggregated level of trade data. However, the main limitation of the model is that it is a partial equilibrium model, which means the results of the model are limited to the direct effects of a trade policy change only in one market.

The demand side of the market in this model is based on the assumption of Armington that commodities are differentiated by their countries of origin. It means imported products from countries are imperfect substitutes for each other and import demand does not completely shift to one source under the preferential trade liberalization of FTA. This assumption is suitable to the status of Vietnam due to the fact that the country imports automobiles from many countries in the world such as the EU, China, the United States, Korea, Japan, Thailand and India. The output of the SMART model presents the various impacts of tariff reduction of a FTA including trade effects (import, export, trade creation and trade diversion), price effect, and also the effects on tariff revenue, consumer surplus and welfare.

Tu Thuy Anh and Le Minh Ngoc (2015) used the SMART model to analyze the potential impacts of the Regional Comprehensive Economic Partnership (RCEP) between ASEAN and six partner countries (China, Korea, Japan, India, Australia and New Zealand) on the industries of Vietnam [5]. The authors concluded that import growth as well as the loss of government revenue is considerably large. Also adopting the SMART model, Vu Thanh Huong (2016a) pointed out that tariff elimination from the EVFTA only affected slightly Vietnam's pharmaceutical imports from the EU, but the import changes significantly varied between the EU country and groups of products [3]. Karingi et al. (2005) used the SMART model to estimate the impact of Economic Partnership Agreements between the EU and Africa and found out that the trade concessions between the two sides would raise adjustment costs and reduce the process of industrialization in African countries [6]. In addition, the EU could gain commercial benefits, but most of them came from trade diversion to other countries in the world. Also applying the SMART model, Karingi et al.

(2005) assessed the impacts of the ECOWAS - EU Economics Partnership Agreement, assuming full liberalization of imports from the EU into ECOWAS [7]. The study found out that EU's exports to ECOWAS might increase about USD 1.8 billion and the rate of trade diversion would be about 6.7%.

The review of past literature shows that using SMART is common and efficient for the analysis of the trade impact of a FTA. Inference from results of the SMART simulation can also be good implications for both governments and enterprises in a given industry to prepare themselves for trade liberalization under an FTA. In this paper, the SMART model therefore is adopted to capture the trade effects of tariff elimination on Vietnam's automobile imports from the EU and from that draw out some implications for Vietnam.

4.2. Data

According to Ahmed (2010), this model requires inputs of three types of elasticity: Export Supply Elasticity, Import Substitution Elasticity, and Import Demand Elasticity [8]. This study assumed that Vietnam's automobile market is too small to affect foreign export prices, so the foreign export supply elasticity is infinite. WITS database provides the following values for the behavioral parameters: (i) import demand elasticity for the commodity of 1.5 and (ii) substitution elasticity between varieties of the commodity of 0.69. The above defaulted elasticity was adopted in this paper because they are appropriate for industrial products as suggested by Amjadi et al. (2011) [9]. Using these elasticity parameters of the SMART model is also a common approach used in the previous studies such as Cassing et al. (2010) [10], Baker et al. (2014) [11], Karingi et al. (2005) [6], Veeramani and Saini (2017) [2] and Vanzetti et al. (2014) [13]. Beside these elasticity, the SMART also requires the following data: import values from each foreign partner and tariffs faced by each foreign partner. The above

input data required to implement the model were extracted from WITS.

This paper adopted the HS (Harmonized System) classification and assessed the impact of the EVFTA on Vietnam's imports of three groups of CBU automobiles namely HS 8703 (Motor cars and other motor vehicles principally designed for transport of people), HS 8704 (Motor vehicles for the transport of goods) and HS 8705 (Special purposes motor vehicles). It is because these three groups account for 99% of total Vietnam's imports of CBU automobiles from the world. Data on Vietnam's imports of automobiles from the EU and the world were collected from the International Trade Center database.

4.3. Scenarios

Two scenarios were constructed based on Vietnam's automobile-related commitments under the EVFTA as well as the current pace of Vietnam's integration in this sector with ASEAN+3, the groups of countries that Vietnam has sharply increased car imports from in recent years.

- Scenario 1: Vietnam eliminates tariff on automobiles imported from the EU without taking into consideration Vietnam's other FTAs

- Scenario 2: This scenario included FTAs of ASEAN+3 in simulation, in which Vietnam eliminates tariffs for automobiles imported from both the EU and ASEAN+3 (ASEAN and its three partners including China, South Korea and Japan).

Within ASEAN+3, Vietnam signed many FTAs including AKFTA (ASEAN-Korean FTA), AJCEP (ASEAN-Japan Comprehensive Economic Partnership), ACFTA (ASEAN-China FTA), VJEPA (Vietnam-Japan Economic Partnership Agreement) and VKFTA (Vietnam-Korea FTA). In these FTAs, Vietnam commits to reduce automobile tariffs but some types of automobiles within ASEAN+3 are categorized in a sensitive list, which must be subject to a

certain level of tariff rates. Therefore, this scenario is ambitious to assume that under pressure of integration, ASEAN+3 nations will try to keep up with the pace of liberalization in the EVFTA and promote the development of the ASEAN Economic Community by removing tariffs for automobiles within the region.

Vietnam and the EU signed the EVFTA in December 2015 and this agreement is expected to enter into force in 2018. Hence, the results of the paper represent the impact of tariff elimination in 2028 and the base year for both scenarios is 2014.

5. Results and discussion

5.1. Results

Impacts of the EVFTA on overall changes in Vietnam's automobile imports from the EU

The results show that Vietnam's imports of automobiles from the EU would increase considerably in both scenarios (Table 2) because of the high initial automobile trade and tariffs between the two parties. In the first scenario, the imports from the EU would increase by 63.67% compared to the initial level of the base year, equivalent to USD 94.47 million. In scenario 2, the imports would grow at a lower rate of 42.22%, corresponding to USD 62.63 million. This is because when Vietnam also removes tariffs for ASEAN+3, the automobile prices of ASEAN+3 nations relative to that of the EU would be lower in scenario 2, making Vietnam transfer a part of its imports from the EU to the ASEAN+3 region.

In comparing scenarios 1 and 2, Vietnam's imports from the EU would reduce by USD 31.8 million, equivalent to a big reduction of 33.7%, implying that the deeper integration of Vietnam with ASEAN+3 would substantially shift Vietnam away from the EU cars and move towards cars from the ASEAN region.

Table 2. Overall changes in Vietnam's automobile imports from EU in two scenarios

Indicators	Scenario 1	Scenario 2
Initial import value ('000USD)	148,369	148,369
Import value in 2028 ('000USD)	242,840	211,007
Total import change ('000USD)	94,471	62, 638
Trade creation ('000USD)	55,153	55,153
Trade diversion ('000USD)	39,318	7,485
Increase in import (%)	63.67	42.22
Trade creation/ Total import change (%)	58.38	88.05

Source: Author's calculations from SMART simulation results.

5.2. Impacts of the EVFTA by the EU country

Table 3 represents ten EU nations from which Vietnam would increase imports most. In two scenarios, Germany and the UK are the biggest gainers from tariff changes, accounting for more than 80% of Vietnam's total import increases from the EUs (Table 3). That is rational as Germany and the UK are among the largest automobile exporting and producing countries in the world and also the two biggest automobile sources for Vietnam in the whole period 2001-2015. Besides Germany and the UK, Hungary, Austria, Slovakia, France, Spain and Italy could also benefit substantially from

exporting more to Vietnam, representing about 15% of Vietnam's total import increase in both scenarios. Thus, after the EVFTA enters into force, enterprises from these countries would become fierce competitors against the domestic enterprises in the market in Vietnam. The 18 remaining nations would increase very minimally their exports of automobiles to Vietnam (0.1%).

The growth rate of Vietnam's automobile imports from most of the EU markets would be at high levels. In both scenarios, the nations with the highest growth rate might be the UK, followed by Austria and Slovakia. The import growth rates of all EU countries in scenario 1 would be higher than those in scenario 2, suggesting that ASEAN+3 countries will compete strongly with the EU in exporting to Vietnam if Vietnam offers similar automobile preferential tariffs for them.

5.3. Impacts of the EVFTA by automobile group

According to simulation results, there might be an uneven distribution of Vietnam's changes in imports from the EU among automobile groups. In both scenarios, more than 97% of increases in the imports could be in HS 8703 (Table 4), accounting for USD 92.5 million in scenario 1 and over USD 60 million in scenario 2. In addition, this group also has the highest growth rates in both scenarios 1 and 2 at about 85.17% and 56.13% respectively. These high growth rates and values result from the high initial imports and tariff rates between Vietnam and the EU in HS 8703. Vietnam would import USD 1.2 million more of HS 8704 from the EU, equivalent to an increase of 27.49%. Although HS 8705 has been the second biggest group of cars imported from the EU its proportion in total import changes is at the lowest, mainly because the group has a very low initial import tariff rate of only 3.33%.

Table 3. Changes in Vietnam's automobile imports by EU nations

No	Nation	Scenario 1			Scenario 2		
		Total import changes ('000USD)	Proportion in total import changes (%)	Growth (%)	Total import changes ('000USD)	Proportion in total import changes (%)	Growth (%)
1	Germany	52,399	55.5	63.15	34,506	55.09	41.59
2	UK	26,173	27.7	103.25	18,007	28.75	71.03
3	Hungary	4,493	4.8	71.90	2,447	3.91	39.17
4	Austria	3,084	3.3	99.69	2,129	3.4	68.81
5	Slovakia	3,581	3.8	79.23	2,078	3.32	45.98
6	France	1,566	1.7	16.64	1,110	1.77	11.80
7	Spain	1,296	1.4	53.89	951	1.52	39.53
8	Italy	921	1.0	23.43	726	1.16	18.46
9	Netherland	614	0.6	20.10	389	0.62	12.74
10	Finland	227	0.2	3.15	211	0.34	2.93
11	Others	118	0.1	-	84	0.1	-
	Total	94,471	100	63.67	62,638	100	42.2

Source: Authors' calculations from SMART simulation results.

Table 4. Changes in Vietnam's automobile imports from the EU by group of product

Product group	Scenario 1			Scenario 2		
	Total import change ('000USD)	Proportion in total change (%)	Growth (%)	Total import change ('000USD)	Proportion in total change (%)	Growth (%)
HS 8703	92,514	97.93	85.17	60,976	97.35	56.13
HS 8704	1,220	1.29	27.49	975	1.56	21.97
HS 8705	738	0.78	2.09	687	1.09	1.95
Total	94,472	100.00	63.67	62,638	100.00	42.22

Source: Authors' calculation from simulation results.

It is noted that in comparison with scenario 1, Vietnam's total automobile imports from the EU in scenario 2 decrease by USD 31.8 million, mainly because of the decreases in imports of HS 8703. It implies that when Vietnam removes tariffs for both the EU and ASEAN+3, its imports of HS 8703 from the EU would be most severely affected as Vietnam would shift its imports from the EU countries to ASEAN+3 nations.

5.4. Impacts of the EVFTA by automobile product

The above analysis shows that Vietnam should take into more careful consideration the changes in imports of HS 8703, which has the highest increases in both import value and growth rate. For this reason, this part analyzes in more detail the changes in imports of HS 8703 at a disaggregated level in order to identify the most vulnerable automobile products for Vietnam under the impact of the EVFTA.

HS 870323 (automobiles principally designed for the transport of persons with cylinder capacity exceeding 1,500cc but not exceeding 3,000cc) would be the product with the largest import increase, taking up nearly 60% of total increases in imports from the EU in scenario 1 and more than 51% in scenario 2 (Table 5). When Vietnam removes tariffs for both the EU and ASEAN+3 nations in scenario 2, the EU would lose a substantial part of HS 870323s market in Vietnam to Japan and Korea. According to results from the SMART model, in this scenario, Vietnam's automobile imports from Japan and Korea would increase rapidly by about USD 10.06 million and USD 6.24 million, respectively.

Table 5. Changes in Vietnam's automobile imports from the EU by product

Product	Scenario 1			Scenario 2		
	Total import change ('000USD)	Proportion in total change (%)	Growth (%)	Total import change ('000USD)	Proportion in total change (%)	Growth (%)
HS 8703	92,514	97.93	85.17	60,976	97.35	56.13
870310	0	0	0	0	0	0
870321	254	0.27	79.8	346	0.55	108.57
870322	635	0.67	83.69	393	0.63	51.82
870323	56,357	59.66	68.19	32,256	51.5	39.03
870324	32,131	34.01	139.42	25,600	40.87	111.08
870332	216	0.23	772.28	204	0.33	728.33
870333	2,920	3.09	160.03	2,177	3.48	119.32
870390	0	0	0	0	0	0

Source: Authors' calculations from simulation results.

The second biggest product in terms of import increases would be HS 870324 (automobiles designed for the transport of persons of a cylinder capacity exceeding 3,000cc) and ranking third would be HS 870333 (automobiles principally designed for the transport of persons of a cylinder capacity exceeding 2,500cc). The former would account for 34% of total additional automobile imports into Vietnam from the EU in scenario 1 and over 40% in scenario 2 while the proportion of the latter is around just 3% in both scenarios. In scenario 2, the integration of Vietnam with ASEAN+3 countries would lead to a significant fall in Vietnam's imports of these two products from the EU, while Japan would be the key partner replacing the EU automobiles in Vietnam.

Imports of three products namely HS 870324, HS 870332 (automobiles designed for

the transport of persons with cylinder capacity exceeding 1,500cc but not exceeding 2,500cc) and HS 870333 (automobiles designed for the transport of persons with cylinder capacity exceeding 2,500cc) might grow at a rocket rate, especially HS 870332 with a growth rate of more than 700%. In comparison with scenario 1, changes in Vietnam's imports from the EU of HS 870332 would decrease by USD 12 thousand in scenario 2 and this difference would shift mainly to Korea.

5.5. *Trade creation and trade diversion effect*

Total changes in Vietnam's imports from the EU can be decomposed into two parts including trade creation and trade diversion. Trade creation occurs when Vietnam increases

imports from the EU due to domestic production being replaced by more efficient imports from the EU. Trade creation therefore would raise the total economic benefits for the EVFTA members. At the same time, domestic consumers will also benefit from the consumption of cheaper automobiles, but trade creation creates competition for the domestic producers. Trade diversion by contrast occurs when Vietnam's imports from the EU increase due to reduction of the EUs automobile price relative to the rest of the world. Trade diversion will lower welfare because the low-cost production from the rest of the world is replaced by less efficient EVFTA members and production is forced to shift away from the comparative advantage.

Table 6. Trade creation and trade diversion effect of the EVFTA

Nation	Trade creation			Scenario 1			Scenario 2		
	Trade creation ('000 USD)	Share in total trade creation (%)	Total trade effect ('000 USD)	Trade diversion ('000 USD)	Share of trade creation in total trade effects (%)	Total trade effect ('000 USD	Trade diversion ('000 USD)	Share of trade creation in total trade effects (%)	
Germany	30,643	55.56	52,399	21,756	58.48	34,506	3,863	88.8	
UK	16,331	29.61	26,173	9,842	62.4	18,007	1,676	90.7	
Hungary	2,116	3.84	4,493	2,376	47.1	2,447	331	86.47	
Austria	1,943	3.52	3,084	1,141	63	2,129	186	91.3	
Slovak	1,830	3.32	3,581	1,751	51.1	2,078	248	88.06	
France	714	1.3	1,566	852	45.6	1,110	396	64.3	
Spain	551	1	1,296	745	42.5	951	400	57.94	
Italy	644	1.17	921	277	70	726	82	88.7	
Netherland	186	0.34	614	428	30.3	389	203	47.8	
Finland	153	0.28	227	74	67.4	211	58	72.5	
Others	42	0.08	118	76	35.6	84	42	50.0	
Total	**55,153**	**100.00**	**94,471**	**39,318**	**58.4**	**62,638**	**7,485**	**88.05**	

Source: Authors' calculations from SMART simulation results.

The SMART results show that the trade creation effect would be larger than the trade diversion effect in both scenarios, implying that the EVFTA would increase welfare for Vietnam. In scenario 1, trade creation would account for 58.4% of total trade effects (Table 6). In scenario 2, some key and traditional partners like Korea, Japan and Thailand also lower the price of automobiles, so the trade diversion effect would reduce and the trade creation effect would increase considerably to 88.05%. Although the trade creation effect of both scenarios is higher than the trade diversion effect, the share of trade creation in total trade effects in scenario 2 is much higher, which claims that the impact of the EVFTA on Vietnam's imports of automobiles from the EU is strongly affected by ASEAN+3 nations. Among the EU countries, Germany and the UK would bring about the highest trade creation effects, followed by Hungary, Austria and Spain in both scenarios.

When Vietnam removes tariffs only for the EU under scenario 1, Vietnam would shift automobile imports from the ASEAN+3 partners to the EU. Among them, Japan would be the biggest loser, followed by Korea, Thailand and China (Table 7).

Table 7. Top four countries suffering from trade diversion in scenario 1

No.	Nation	Trade diversion ('000 USD)
1	Japan	-20,238
2	Korea	-8,582
3	Thailand	-1,561
4	China	-431

Source: Authors' calculations from SMART simulation results.

6. Discussion

Based on the SMART simulation results, this part discusses and suggests some implications in order to support Vietnam to prepare well for the impact of the EVFTA on the automobile sector.

To begin with, overall the SMART simulation results show that tariff reduction under the EVFTA would lead to a significant increase in Vietnam's automobile imports from the EU. The high growth rates of Vietnam's automobile imports from the EU in both scenarios also suggest that the EU would be still among the most important and biggest sources of automobiles for Vietnam if the EVFTA is realized in the future. However, Vietnam's deeper integration with ASEAN+3 would have substantial effects on reducing Vietnam's imports from the EU. In scenario 1, Vietnam's imports of automobiles from the EU would rise by 63.67%, equivalent to USD 94.47 million while the figures for scenario 2 would be 42.22% and USD 62.63 million, respectively. It implies that if Vietnam limits its tariff removal only for automobiles imported from the EU, the EU would significantly improve its market share in the Vietnamese market and ASEAN+3 would lose significantly its competitiveness compared to the EU. So, if Vietnam expects to shift the domestic consumption from ASEAN+3 cars to EU cars, the appropriate policy choice is to promote the EVFTA while keeping the status quo of commitment with ASEAN+3 in the automobile sector.

Secondly, there might be an uneven distribution in Vietnam's total additional imports among the EU countries. In both scenarios, more than 80% of an increase in Vietnam's automobile imports would be concentrated most in Germany and then the UK. Thus, when the EVFTA comes into effect, the biggest competitors for Vietnam's automobile enterprises would be these two nations. Moreover, this competition would sustain over a long term since the increase in imports of Vietnam from both countries is high in terms of both value and growth rate. For this reason, the Vietnamese enterprises need to focus more on understanding the strengths and

weaknesses of automobile enterprises from these two countries while the government should support the domestic firms by establishing an efficient information channel on the automobile enterprises and industries in these markets. These efforts are crucial for Vietnam's enterprises to take full advantage of the benefits from EVFTA and also to limit the challenges when this agreement comes into effect.

Thirdly, there is also uneven distribution of Vietnam's increase in imports by automobile product, resulting in a different level of competition among products. Vietnam would increase imports of HS 8703 from the EU the most, followed by HS 8704. At a disaggregate level, among HS 8703, the biggest increases in imports would fall into HS 870323 and HS 870324, accounting for 59.66% and 34.01% in total additional automobile imports from the EU respectively in scenario 1. In scenario 2, these respective figures would be 51.5% and 40.87%. Both the government and enterprises in Vietnam should perceive this uneven distribution in import increases at a disaggregated level to set up the most appropriate business strategy and policies. More specifically, the domestic automobile enterprises whose product portfolios focus on these above products need to put high priority in understanding more the domestic market and in increasing their capacity in order to serve the domestic market better. The long-term business strategies for them are to be open in cooperating with the EU car enterprises to take advantage of participating in and moving up the car global supply chain. Besides, the government of Vietnam should support the domestic automobile firms in R&D activities and technology so as to increase their capacity to cope better with the EU enterprises.

Fourthly, the trade creation effect would be higher than the trade diversion effect, implying that Vietnam's welfare would be improved when the EVFTA comes into effect. Trade creation accounts for 58% of the total trade effect in scenario 1 and grows substantially to 88.05% in scenario 2. This means that

Vietnam's deeper integration with ASEAN+3 nations would substantially make Vietnam better off. Therefore, if the priority of Vietnam is to increase social welfare, Vietnam should promote the integration in the automobile sector not only with the EU but also with ASEAN+3 countries. However, Vietnam should consider carefully the point of time to eliminate tariffs for each group of countries to avoid a sudden increase in its automobile imports.

Fifthly, when Vietnam offers 0% tariff rates for both the EU and ASEAN+3 countries, besides the competition from the EU, Vietnam also has to face fierce competition from Japan, Korea, Thailand and China.

Finally, the quantitative results also imply that Vietnam would continuously rely on imports of automobiles from two key partners in the EU including Germany and the UK since the increase in imports of Vietnam from these nations is high in terms of both value and growth rate. In the current context when the EU has been trying to overcome a wide range of economic and political difficulties, and Britain is going to leave the EU, Vietnam should diversify and extend its automobile markets to countries that have smaller shares such as Belgium, France, and Italy to reduce the vulnerability of import sources and meet adequately the increasing domestic demand for high-quality automobiles.

7. Conclusions

By adopting the SMART model, this paper analyzed the impact of tariff elimination under the EVFTA on Vietnam's imports of CBU automobiles from the EU in two scenarios, which were constructed based on Vietnam's tariff schedule and the integration with ASEAN+3 countries in the automobile sector. In scenario 1, Vietnam eliminates tariffs only for automobiles imported from the EU while scenario 2 enlarges the scope of tariff reduction to also include ASEAN+3 countries.

The results reveal that Vietnam's automobile imports from the EU would significantly increase in both scenarios, implying that the EU would still be among the most important automobile suppliers for the Vietnamese market in the future. In addition, an uneven distribution in Vietnam's automobile imports from the EU by nation, automobile group and automobile product would occur when the EVFTA comes into effect. Most of the import increases would focus on Germany and the UK in terms of import partner; on HS 8703 and HS 8704 in terms of automobile product group; and on HS 870323 and HS 870324 in terms of automobile product. The EVFTA would also increase the welfare of Vietnam because the trade creation effect is bigger than the trade diversion effect. The above findings are crucial for Vietnam's automobile sector because it provides strong evidence for Vietnam to pay more attention to the impact of the EVFTA and develop appropriate strategies and policies to compete as well as cooperate well with the EU automobile companies to move up in the car global supply chain in the future.

References

[1] Quoc Hung, "In 2015, the automobile sales hit record", Saigon Economics Online, 11/11/2016, http://www.thesaigontimes.vn/140962/Nam-2015-luong-o-to-tieu-thu-tang-ky-luc.html

[2] Duc Huy, "The Vietnamese consumers bought cars at a record rate in 2016", VnExpress, 12/1/2017, http://vnexpress.net/tin-tuc/oto-xe-may/nguoi-viet-mua-oto-nhieu-ky-luc-trong-2016-3526923.html

[3] Vu Thanh Huong, "Assessing potential impacts of the EVFTA on Vietnam's pharmaceutical imports from the EU: An application of SMART analysis", SpringerPlus, 5 (2016a), 1-22.

[4] Vu Thanh Huong, Assessing the possibility to bring about economic benefits of the European – Vietnam Free Trade Agreement, Hanoi, Vietnam:Vietnam National Univeristy, 2016b.

[5] Tu Thuy Anh, Le Minh Ngoc, "Challenges for Vietnam in integrating comprehensively into ASEAN+3: A sector analyis", Journal of Economics and Development, 212 (February 2015).

[6] Karingi, S., Lang, R., Oulmane, N., Perez, R., Jallab, M. S., & Hammouda, H. B., "Economics and Welfare impacts of the EU-Africa Economic Partnership Agreements", African Trade Policy Center, 10 (2005), 1-102.

[7] Karingi, S., Oulmane, N., & Lang, R., "Assessment of the impact of the Economic Partnership Agreement between the ECOWAS countries and the European Union", African Trade Policy Center, 29 (2005).

[8] Ahmed, Shasil, "India-ASEAN trade agreement: A sectoral analysis", SSRN Working Paper 1698849 (2010).

[9] Amjadi, Azita, Schuler, Philip, Kuwahara, Hiroaki, & Quadros, Susanne, WITS: User's manual, Washington DC.: UNCTAD, UNSD, WTO, WB, 2011.

[10] Cassing, James, Trewin, Ray, Vanzetti, David, Truong Dinh Tuyen, Nguyen Anh Duong, Le Quang Lan, & Le Trieu Dzung, Impact assessment of Free Trade Agreement on Vietnam's Economy, Hanoi, Vietnam: MUTRAP, 2010.

[11] Baker, Paul, Vanzetti, David, & Pham, Lan Huong, Sustainable Impact Assessment: EU-Vietnam FTA, Hanoi, Vietnam: MUTRAP IV, 2014.

[12] Veeramani, C., & Saini, G. D., Impact of ASEAN-India Preferential Trade Agreement on Plantation Commodities: A Simulation Analysis, Maharashira, India: Indira Gandhi Institute of Development Research, Mumbai, 2010.

[13] Vanzetti, D., Pham, L. H., & Baker, P., "The European - Vietnam Free Trade Agreement: Sustainable Impact Assessment", Paper presented at the conference Assessing the social, economic and environmental impacts of the European - Vietnam Free Trade Agreement, Hanoi, 2014.