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Analyzing the impact of the EVFTA on the importation of transportation vehicles, parts, and components into Vietnam from the EU: A SMART model approach

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Abstract: This study examines the impact of the EU-Vietnam Free Trade Agreement (EVFTA) on Vietnam's imports of transportation vehicles, parts, and components from the EU. Using the SMART model and data from UN COMTRADE and Vietnamese government agencies, the analysis shows modest increases in import values. Growth rates are 0.23% with the EVFTA alone and 0.21% when the Regional Comprehensive Economic Partnership (RCEP) is also considered. These findings reveal different effects among EU member states and product categories, especially in HS group 87 (vehicles) and HS group 89 (ships and boats), where trade creation is notable for Germany, Slovakia, and Italy. However, the study also finds significant trade diversion, with $361.91 million shifting from other regions to the EU. Despite these modest gains, the EVFTA positively impacts Vietnam's industrial growth and green energy transition by enabling the import of advanced EU products. The research emphasizes the importance of considering how agreements like the RCEP influence the broader economic effects of the EVFTA, as some benefits shift to RCEP countries like Japan, South Korea, and China.

Keywords: EVFTA, transportation imports, SMART model, tariff elimination, trade creation.

1. Introduction

Since 1990, the relationship between Vietnam and the EU has substantially evolved from mere political ties to robust economic and trade collaborations. The EU has become a major export market and an essential source for Vietnam's manufacturing sector, playing a significant role in maintaining production continuity and satisfying domestic demand. Negotiations for the EU-Vietnam Free Trade Agreement (EVFTA) started in June 2012,

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culminating in its signing in June 2019 and subsequent implementation in August 2020. Despite the widespread anticipation of the EVFTA's benefits, there remains a significant gap in comprehensive economic assessments concerning the impact of the EVFTA on the importation of transportation vehicles, parts, and components from the EU to Vietnam. In addition, given the strategic importance of the transportation sector and its implications for Vietnam's economic development and modernization, directly linked to broader objectives like improving logistics, increasing domestic production efficiency, and deepening integration into global supply chains, it is imperative to delve into the potential effects of the EVFTA on the importation of transportation vehicles, parts, and components to inform policy decisions and strategic planning better.

This paper employs the SMART model to evaluate the EVFTA's impact on importing transport parts and components, simulating tariff elimination effects and assessing trade creation and diversion. Data from UN COMTRADE and Vietnamese government agencies are integrated to strengthen the empirical findings.

2. Literature review

Free Trade Agreements (FTAs) play a crucial role in shaping international trade dynamics by reducing or eliminating tariffs, import quotas, and preferences on most (if not all) goods and services traded between member countries. The primary theoretical constructs underpinning the study of FTAs are the concepts of trade creation and trade diversion, as articulated by Viner (1950). Trade creation occurs when an FTA replaces higher-cost domestic production with lower-cost imports from member countries, thereby increasing economic welfare. Conversely, trade diversion happens when lower-cost imports from non-member countries are replaced by higher-cost imports from member countries due to preferential treatment, potentially reducing economic welfare. These effects often interact in complex ways, emphasizing the need to consider their interplay when assessing the overall welfare implications of FTAs (Plummer, Cheong, Hamanaka, 2010; Katsioloudes & Hadjidakis, 2007).

FTAs offer a diverse influence on international trade. Research by Pham et al. (2018) and Vu (2017) underscores the importance of strategic responses to cope with shifts in export-import dynamics following participation in new-generation FTAs. Sector-specific impacts are elucidated by Ji and Yoo (2018), Moon et al. (2013), Jones and Blayney (2014), and Bui (2022), providing insights into agricultural products, consumer behavior, and market dynamics. FTAs also significantly impact economic and market development. Studies by Pham et al. (2018) and Thao (2017) highlight the profound effects of new-generation FTAs on Vietnam's economic landscape and trade patterns, emphasizing the need for strategic responses.

The implementation of the EVFTA provides both parties with opportunities and challenges. Studies by Vu and Nguyen (2016), Nguyen and Tran (2021), and the European Union (2018) highlight robust growth in trade activities and the benefits of tariff elimination and reduction of non-tariff barriers. Studies by Bui et al. (2020), Pham and Dang (2022) offer insights into trade dynamics under the EVFTA and strategies to capitalize on opportunities while mitigating challenges.

Further research on the EVFTA's trade implications by Nguyen et al. (2015) and Tran et al. (2021) reveals potential economic growth alongside intensified competition and sectoral impacts. Nguyen & Pham (2017) and Le et al. (2020) highlight the uneven distribution of growth across sectors and the need for nuanced policy responses. The European-Vietnam Free Trade Agreement (EVFTA) significantly impacts importing vehicles and components in Vietnam. An assessment using the SMART model indicates a substantial increase in Vietnam's automobile imports from the EU, driven by tariff eliminations under the EVFTA. This suggests that the EU will remain a crucial source of cars for Vietnam, with notable trade creation effects surpassing trade diversion effects, enhancing Vietnam's welfare (Huong, 2017). Another study corroborates these findings, highlighting that the EVFTA will boost EU automobile exports to Vietnam by reducing tariffs to 0%, particularly benefiting Germany, Sweden, Italy, and Slovakia. At the same time, non-EU nations might see a negative impact on their exports to Vietnam (Le et al., 2020).

Furthermore, trade facilitation measures, including border efficiency, significantly affect the trade of parts and components, emphasizing

the importance of robust importers' trade facilitation for the machinery and transport equipment sector (Yadav, 2014). Insights from the environmental consequences of NAFTA's trade in used vehicles provide a broader context for understanding the potential environmental impacts of similar trade agreements, highlighting the balance between vehicle emissions and the trade's environmental outcomes (Davis & Kahn, 2010). Lastly, an analysis of the global automobile industry's trade networks over 25 years reveals how geopolitical and technological shifts impact trade in automotive components and parts, with Germany and the US playing central roles (Russo et al., 2022).

The SMART model, known for its granular, product-level analysis, has effectively understood FTA impacts on import dynamics. Hence, researchers choose to leverage it to assess the trade effects of tariff elimination on transportation imports from the EU to Vietnam, aiming for comprehensive insights (Vu & Pham, 2017; Nguyen & Tran, 2021; Vu, 2016; Bui et al., 2020). Despite existing contributions, further research on the EVFTA's impact on transportation imports is warranted, underscoring the need for updated efforts to optimize EVFTA benefits in Vietnam. The SMART model has been extensively utilized to assess the impacts of various scenarios within EU and RCEP member states. An application of the SMART model revealed that the European-Vietnam Free Trade Agreement (EVFTA) significantly boosts Vietnam's automobile imports from the EU, with the trade creation effects outweighing trade diversion effects, enhancing Vietnam's welfare (Vu, 2017).

This paper contributes to the existing literature by providing a detailed assessment of the EVFTA's impact on importing vehicles, parts, and components in Vietnam. It utilizes the SMART model for its granular, product-level analysis. It fills the research gap by offering updated insights and policy recommendations to optimize the benefits of the EVFTA, particularly in the transportation sector. Additionally, it extends the application of the SMART model to analyze scenarios within EU and RCEP member states, providing a comparative analysis that highlights the broader implications of FTAs on international trade dynamics and economic development.

3. Research background

The EVFTA, effective August 1, 2020, represents a significant stride in Vietnam-EU relations. This agreement, spanning 17 chapters across sectors like goods trade and services, eliminates nearly 99% of tariffs in alignment with WTO regulations. Projected to boost Vietnam's GDP by 2.18-3.25% in 2020-2023 and above 4% in 2024 (Vu, 2022), the EVFTA facilitates tariff removal, investment, and standard recognition, offering market access and integration into global value chains for Vietnam.

Under the EVFTA, Vietnam transitioned from average MFN tax rates of 11.93% to preferential rates for EU imports, immediately removing 48.5% of tariff lines, reaching 98.3% in a decade. Tariffs for transport vehicles and parts are abolished upon enforcement, with 0% tariffs maintained until 2030 for 15.61% of lines (VCCI, 2016). Approximately 32.46% of tariff lines are reduced over eight years, with the remainder reduced by the 10^{th} to 11^{th} year (VCCI, 2016). Notably, 15.26% of HS 87 lines retain tariffs, which are expected to be removed by the 11^{th} year (VCCI, 2016). The EVFTA also addresses non-tariff measures, focusing on Technical Barriers to Trade (TBT) for vehicles and equipment. Both parties commit to UNECE regulations as adequate international standards. Although not a UNECE 1958 Agreement member, Vietnam commits to accepting EU-certified vehicles as compliant, reciprocated by the EU upon Vietnam's accession to the UNECE 1958 Agreement.

Despite the EVFTA's promise to enhance trade relations and reduce tariffs, the overall import values have steadily declined, dropping from US$ 2,281.8 million in August 2020 to just US$ 36.41 million by August 2022 - a dramatic decrease of approximately 64.2% (Figure 1). This decline suggests that the anticipated benefits of the EVFTA may not have fully materialized, potentially due to external factors such as the COVID-19 pandemic, global supply chain disruptions, and geopolitical uncertainties, highlighting the complexities in translating trade agreements into sustained economic benefits.

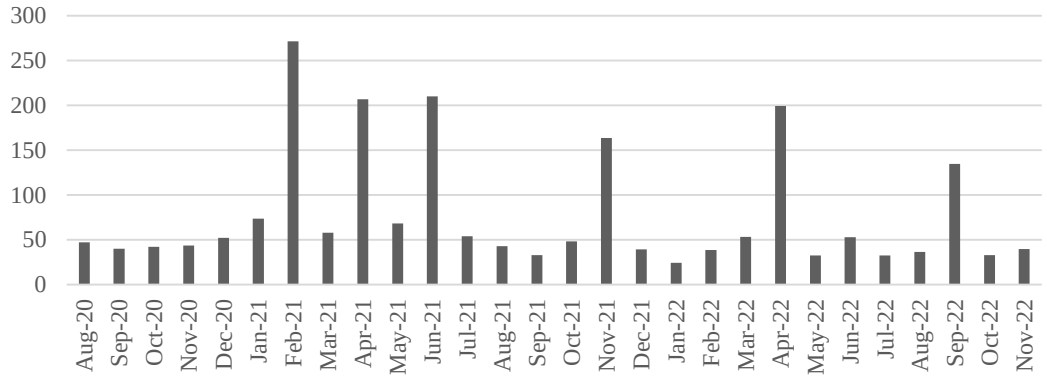

Figure 1: Import value of transportation vehicles, parts, and components from the EU to Vietnam in the period 8/2020 - 8/2022 (Million USD)
Source: General Customs Office (2023).

Table 1: Top 5 EU exporters of transportation vehicles, parts, and components to Vietnam, 2020-2022 (Million USD)

Importing country	**One year of EVFTA implementation (8/2020 - 7/2021)**	**% growth compared to the same period in the previous year (8/2019 - 7/2020)**	**First 8 months of 2022 (1/2022 - 8/2022)**	**% growth compared to the same period the previous year (1/2021 - 8/2021)**
EU	1166.18	-26.64%	468.95	-52.36%
Germany	775.40	-29.13%	183.23	-74.32%
Netherlands	122,58	13,24	38,48	-61,91
Italy	39,77	62,08	15,07	-54,16
Poland	24,13	84,97	1,53	-54,25
Spain	22,78	30,69	12,41	1,95

Source: The authors' calculation from UN COMTRADE.

Among the top 5 EU exporters of transportation vehicles, parts, and components to Vietnam, Germany, the largest exporter, saw its import value plummet by 76.37% from US$ 775.40 million in the first year of the EVFTA to US$ 183.23 million in the first eight months of 2022 (Table 1). Similar declines were observed in the Netherlands, Italy, Poland, and Spain, which experienced drops of 68.6%, 62.1%, 63.94%, and 45.5%, respectively. These declines following the EVFTA highlight the importance of understanding the full potential of the EVFTA and its interaction with other new-generation FTAs, such as the RCEP for the imports of transportation vehicles, parts, and components into Vietnam from the EU.

4. Methodology and data

The study adopts the SMART model, a renowned quantitative methodology for evaluating the impacts of FTAs on trade dynamics and economic welfare. Developed collaboratively by the World Bank and the United Nations Conference on Trade and Development (UNCTAD), SMART is integrated seamlessly into the World Integrated Trade Solution (WITS) framework. This model draws on foundational economic theories such as local equilibrium and trade creation, offering robust analytical capabilities. Key features of the SMART model include its ability to calculate trade creation and trade diversion effects resulting from tariff changes, to assess changes in consumer welfare due to price variations in imported goods, and to integrate data from various sources, providing comprehensive insights in a user-friendly manner. The advantages of the SMART model encompass detailed product-level analysis at the HS (Harmonized System) code level for precise impact assessments, policy simulation

capabilities for understanding potential economic outcomes of various tariff scenarios, and ease of use through its integration with WITS, making it accessible for researchers and analysts and promoting widespread use in trade policy evaluations.

Leveraging the SMART model, this study aims to provide nuanced insights into the implications of the EVFTA on transportation imports, focusing mainly on HS codes 86-89:

HS 86: Encompasses railway or tramway locomotives, rolling stock, associated parts, fixtures, fittings, and mechanical traffic signaling equipment.

HS 87: Pertains to motor vehicles, excluding railway or tramway rolling stock, inclusive of parts and accessories.

HS 88: Addresses aircraft, spacecraft, and their respective components.

HS 89: Covers ships, boats, and floating structures.

Moreover, the study incorporates 4-digit HS codes within these chapters to furnish detailed analyses, enabling a granular examination of transportation-related imports from the EU to Vietnam.

Data aggregation for the SMART model draws upon diverse sources, facilitated by the WITS tool, which amalgamates information from the United Nations Comtrade Consumer Trade Statistics Database (UN's COMTRADE), Trade Map, MFN tariff data sourced from the UNCTAD, and the World Trade Organization (WTO) Integration Database (IDB). These secondary datasets, encompassing the period from the onset to the culmination of 2020, underpin the model's analytical framework.

Table 2: Data collection method

No.	Data	Collection method
1	Import value from EU27 to Vietnam	Data on transportation goods' import value (HS codes 86-89) from the EU to Vietnam, sourced from the WITS database using the SMART tool, based on 2020 data, including EU27 partners under EVFTA.
2	Tariff rates on EU27 partners	Tariff rates from Vietnam's EVFTA schedule and WTO database via WITS for transportation imports from the EU.
3	Import demand elasticity	Elasticity derived from WITS reflects the responsiveness of import demand for transportation goods from the EU in Vietnam.
4	Export supply elasticity	Assumed infinite under EVFTA, denoted as Ex = 99, indicating EU's endeavor to export transportation goods to Vietnam.
5	Substitution elasticity	The default value of substitution elasticity in the SMART model is set at 1.5*.

Note: *The default substitution elasticity of 1.5 in the SMART model reflects a moderate level of substitutability, balancing sensitivity to price changes with realism, and is grounded in empirical research. This value is particularly significant because it standardizes analyses across studies, making comparisons more reliable, and provides a solid baseline for diverse markets and products (World Bank, 2011; Francois & Hall, 2009).

Source: The authors.

Additionally, where data was unavailable via WITS, the study incorporated information from various supplementary sources: (i) General Statistics Office of Vietnam data, offering comprehensive statistical insights. (ii) UN COMTRADE bilateral trade data detailing international trade flows within the HS code. (iii) Vietnam's Import-Export Reports from the Ministry of Industry and Trade, presenting national-level trade dynamics. (iv) Insights from reputable sources like VCCI publications, VTV news reports, Government newspapers, and other credible sources to enrich the analysis with supplementary data.

The study examines two tariff scenarios to frame its analysis:

Scenario 1: Vietnam and the EU uphold tariff elimination commitments under the EVFTA, with no additional integration for importing transportation goods from other nations. This results in a uniform reduction of tariffs to 0% for all relevant commodity groups, allowing the SMART model to assess tariff removal impacts across all 27 EU member states without affecting prices.

Scenario 2: Tariff reductions include the EVFTA and the RCEP, covering 41 countries - and 14 RCEP member states. The RCEP was

strategically selected due to its recent enforcement in 2022 and its significant role in Vietnam's import structure, particularly with key partners like China, Japan, and South Korea. This scenario provides a broader perspective on how Vietnam's deeper integration with the RCEP, alongside the EVFTA, influences trade patterns, capturing the most relevant competitive pressures. Focusing on the RCEP offers timely, actionable insights into Vietnam's evolving trade policies, especially in the transportation sector, where other FTAs lack similar impact.

5. Empirical findings

The empirical findings reveal several insightful results about the impact of the EVFTA on Vietnam's importation of transportation vehicles, parts, and components from the EU. While the overall increase in import values is modest, significant variations exist among different EU member states and product categories. Some EU countries, such as Germany, and product groups like motor vehicles are experiencing more substantial benefits. Additionally, the findings underscore the importance of considering regional trade agreements like the RCEP when evaluating the broader economic implications of FTAs such as the EVFTA.

The overall simulation results indicate that while the EVFTA positively influences the importation of transportation vehicles, parts, and components, the impact is relatively modest (Table 3). Under Scenario 1, import values increase by approximately US$ 0.87 million, representing a growth rate of 0.23%. Scenario 2 shows a slightly lower increase of US$ 0.80 million, with a growth rate of 0.21%, suggesting that Vietnam's integration with the RCEP does not significantly impact imports from the EU. Trade creation remains strong at US$ 183.82 million in both scenarios, highlighting the EVFTA's role in boosting EU imports through tariff reductions. Trade diversion, however, is significant, with US$ 361.91 million under Scenario 1 and a reduced US$ 317.78 million under Scenario 2. This reduction in trade diversion under Scenario 2 implies that the RCEP offers competitive alternatives, yet the EVFTA still successfully enhances the competitiveness of EU suppliers in the Vietnamese market by shifting imports from other suppliers to the EU, even when the RCEP's tariff exemptions are considered.

Table 3: Overall changes in importation of vehicles, parts, and from the EU in two scenarios

Indicator	Scenario 1	Scenario 2
Initial import value (in US$ 1,000,000)	371.02	371.02
Import value after EVFTA (in US$ 1,000,000)	371.88	371.81
Total import change (in US$ 1,000,000)	0.87	0.79
Increase in imports (%)	0.23	0.21
Trade creation (in US$ 1,000,000)	183.82	183.82
Trade diversion (in US$ 1,000,000)	361.91	317.78

Source: Authors' calculation in the SMART model.

In examining the impact of the EVFTA on Vietnam's imports from EU member states, notable differences emerge between scenarios focused solely on the EVFTA and those incorporating the RCEP (Table 4). Under the EVFTA alone, Germany sees the largest increase in total trade effect at US$ 239.17 thousand, driven primarily by trade diversion. Slovakia follows with a US$ 98.6 thousand increase, while Italy, Spain, and Austria also benefit, though to a lesser extent. When the RCEP is included, these effects are moderated, with Germany's total trade effect decreasing to US$ 210.25 thousand, and similar reductions observed for Slovakia, Italy, and Spain. This highlights how the EVFTA encourages trade creation and diversion toward the EU, but these gains are tempered when the RCEP is also considered, illustrating the complexities of overlapping trade agreements.

Table 4: Top 5 EU exporters most impacted by the EVFTA in both scenarios

Nation	Scenario 1			Scenario 2		
	Total trade effect (US$ 1,000)	Trade diversion (US$ 1,000)	Trade creation (US$ 1,000)	Total trade effect (US$ 1,000)	Trade diversion (US$ 1,000)	Trade creation (US$ 1,000)
Austria	32.79	10.97	21.82	28.05	6.23	21.82
Germany	239.17	206.74	32.43	210.25	177.82	32.43
Italy	63.07	34.06	29.01	57.59	28.58	29.01
Slovakia	98.6	57.08	41.52	91.22	49.70	41.52
Spain	47.14	21.5	25.64	43.29	17.65	25.64

Source: Authors' calculation in the SMART model.

Table 4 shows that trade diversion outweighs trade creation in both scenarios, highlighting challenges with the impact of EVFTA. In Scenario 1, trade diversion totals US$ 361.91 million, compared to US$ 183.82 million in trade creation, indicating more imports from the EU at the expense of other countries. When the RCEP is considered in Scenario 2, trade diversion decreases to US$ 317.78 million, suggesting the RCEP offers competitive alternatives to EU imports. Germany benefits most from trade creation, with US$ 32.43 million, followed by Slovakia and Italy. However, this concentration of benefits raises concerns about uneven distribution across the EU. Among non-EU partners, Thailand, Japan, and Indonesia are most affected by trade diversion, particularly shifting imports from China, Malaysia, and South Korea to the EU. Seven of the top non-EU countries impacted by trade diversion are RCEP members, implying potential negative effects on Vietnam's integration with ASEAN and the broader Asian region. In Scenario 2, Japan and China see positive trade diversion values, benefiting from exporting vehicles and parts to Vietnam, while Thailand, Indonesia, and the U.S. still face negative impacts from tariff removals under both agreements.

Table 5: Top 5 non-EU countries suffering from trade diversion in both scenarios

Nation	Scenario 1			Scenario 2		
	Trade creation (in US$ 1,000)	Trade diversion (in US$ 1,000)	Total trade effect (in US$ 1,000)	Trade creation (in US$ 1,000)	Trade diversion (in US$ 1,000)	Total trade effect (in US$ 1,000)
Thailand	0	-249.97	-249.97	0.00	-426.78	-426.78
Japan	0	-76.7	-76.7	361.07	123.96	485.03
Indonesia	0	-32.93	-32.93	0.00	-75.37	-75.37
The USA	0	-31.07	-31.07	0.00	-48.83	-48.83
China	0	-20.99	-20.99	114.40	20.33	134.72

Source: Authors' calculation in SMART model.

The simulation results also reveal an uneven distribution of Vietnam's increased imports from the EU across product groups (Table 6). In Scenario 1, it's evident that 97.73% of the increased import volume of vehicles and their parts and components from the EU to Vietnam comes from HS group 87. Similarly, in Scenario 2, HS 87 contributes to nearly 99.7% of the increased imports. However, compared to Scenario 1, the total imports of vehicles and their parts and components from the EU decreased by over US$ 73 thousand in Scenario 2, primarily due to a decrease in the import value of HS group 87 by over US$ 56 thousand. This result suggests that with the EVFTA and RCEP in effect, Vietnam shifts the importation of HS 87 to countries within the RCEP. This can be explained by HS 87 being a primary import category for Vietnam from RCEP countries. Notably, import tariffs are lower in Thailand, Indonesia, and China, resulting in lower costs than imports from the EU.

Table 6: Changes to Vietnam's vehicle parts and components imports from the EU by product

Product (HS Code)	Scenario 1			Scenario 2		
	Total import changes (in US$ 1,000)	Proportion in total import changes (%)	Growth (%)	Total import changes (in US$ 1,000)	Proportion in total import changes (%)	Growth (%)
86	0	0	0.00	0	0	0
87	848.37	97.73	0.36	791.91	99.67	0.34
88	0	0.00	0.00	0	0	0
89	19.73	2.27	0.18	2.65	0.33	0.02
Total	**868.10**	**100.0**	**0.54**	**794.55**	**100**	**0.34**

Source: Authors' calculation in the SMART model.

Additionally, RCEP member countries have committed to reducing tariffs on this category over time. Similarly to HS group 87, the import increase of HS group 89 also decreases from US$ 19.726 thousand in Scenario 1 to US$ 2.646 thousand in Scenario 2. Moreover, the growth rate of this product group also declines from 0.18% to 0.019%. In Scenario 2, when Vietnam removes tariffs for both the EU and RCEP countries, imports of HS group 89 from the EU will decrease sharply by about 86.6% compared to Scenario 1, and Vietnam will replace imports of HS group 89 from the EU with imports from the US, China, and Japan. This can be explained by the fact that with the RCEP, the import tariff rate for this category from China is reduced to 0% in the first year and exempted if imported from Japan. Therefore, even with the EVFTA, the tariff rate reduction period of 5 years creates significant price disadvantages compared to countries currently enjoying a 0% import tariff rate in Vietnam.

6. Discussion

The EVFTA has significantly enhanced EU-Vietnam economic relations, particularly within the transportation sector. According to the SMART model, the EVFTA has led to an increase in the importation of transportation vehicles, parts, and components from the EU, with growth rates of 0.23% under Scenario 1 (EVFTA alone) and 0.21% under Scenario 2 (EVFTA combined with RCEP). These results reflect the improved accessibility and affordability of EU goods in Vietnam, especially within HS 87 and HS 89, which are pivotal in import value growth. Given the modest figures, the EVFTA has expanded access to EU transportation products, which has benefited domestic production growth and automotive input sources' diversification in Vietnam's automotive sector. Notable collaborations include THACO's partnership with BMW in 2022, which was enabled by the increase in imports of components from Germany, contributing US$ 32.43 million in trade creation. This has led to the local assembly of models such as the 3 Series and X5 in Chu Lai, Vietnam (NH, 2022). By 2023, Vietnam secured US$ 384.3 million in FDI, including key projects like the Skoda assembly plant targeting an annual capacity of 120,000 units (Dat, 2023). These investments underscore the strategic importance of the EVFTA in enhancing Vietnam's automotive industry and integrating it into global supply chains.

The importation of EU automotive components is expected to improve vehicle quality and enhance the integration of domestic automotive enterprises into the global supply chain. The SMART model highlights that Germany, Slovakia, Italy, and Spain, benefiting from trade creation, may be potential contributors to the elevation in the standards and capabilities of Vietnam's automotive sector. The country now hosts 58 domestic suppliers for Toyota, and THACO - one of Vietnam's leading corporations in the field of automobile manufacturing and assembly - has planned to expand its supporting factories from 20 to 36 by 2025, further solidifying Chu Lai's position as a manufacturing hub (Huong, 2023).

Besides, the EVFTA also facilitates the upgrade and development of Vietnam's logistics infrastructure, particularly in the maritime and railway sectors. The SMART model shows an increase in the import value of products under HS code 89, which includes ships and floating structures, thanks to the reduction of import

tariffs to 0% under the EVFTA. This result allows Vietnam to more easily import modern ships from the EU with more affordable costs, helping to improve operational efficiency and technical standards of the sector. In the railway sector, the SMART model also indicates that products under HS code 86 (railways and related equipment) saw an increase in import value in Scenario 2, in which all importing tariff lines are eliminated. These positive changes are expected to support the upgrade of the national railway system, improving operational efficiency, and enhancing regional transportation connectivity.

Lastly, the EVFTA opens up opportunities for Vietnam to transition to and develop the green energy sector in transportation. On July 22, 2022, the Vietnamese Prime Minister issued Decision No. 876/QD-TTg approving the Green Energy Transition Action Program, aimed at reducing carbon and methane emissions in the transportation sector. The program targets developing a green transportation system with the goal of achieving net-zero greenhouse gas emissions by 2050. This program outlines a roadmap for various transportation modes, including road, rail, inland waterways, maritime, and aviation, to shift toward electric and green energy sources. The EVFTA can contribute to this transition by facilitating the importation of green technologies and components from the EU. Given Vietnam's relatively underdeveloped technological and industrial base compared to the EU, these imports are essential for achieving the nation’s green energy goals.

However, the landscape of importing vehicles, parts, and components into Vietnam post-EVFTA presents multifaceted challenges. Despite the tariff reductions facilitated by the agreement, the SMART model highlights significant trade diversion of US$ 361.91 million in Scenario 1, indicating that while EU products have become more accessible, their high cost, coupled with elevated import taxes and other levies, limits their appeal compared to cheaper alternatives from markets like Thailand, Indonesia, and China.

Additionally, the internal dynamics within the EU introduce further complexity. The SMART model reveals that while countries like Germany, Slovakia, and Italy benefit from trade creation, other EU member states face intensified competition due to similar product structures. For instance, intra-EU competition among France, the Netherlands, and the Czech Republic could further challenge Vietnam's market dynamics, particularly as these countries possess distinct export advantages. Moreover, the EU's stringent environmental regulations, targeting a shift towards emission-free mobility, may increase production costs and make EU vehicles less competitive against rapidly advancing electric vehicle technologies from global players, particularly China.

The SMART model shows that in Scenario 2, when Vietnam removes tariffs for both the EVFTA and RCEP, some benefits initially gained by the EU are redistributed to RCEP countries. For example, Japan, South Korea, and China show positive trade creation values, benefiting from increased exports to Vietnam due to reduced tariffs. This redistribution highlights the importance of the RCEP in balancing the influence of the EVFTA, making imports from RCEP countries more competitive. The dual participation in both agreements enables Vietnam to leverage advantages from multiple trade partners, fostering a more balanced and diversified import portfolio.

7. Conclusion

The findings of this study highlight the nuanced impact of the EVFTA on Vietnam's importation of transportation vehicles, parts, and components from the EU. While the agreement has led to improved market access for EU products, the overall growth in import values remains modest, with only slight increases in Scenario 1 (0.23%) and Scenario 2 (0.21%). This suggests that the benefits of the EVFTA, while present, are constrained by factors such as high costs, import taxes, and competition from cheaper alternatives in Asia. However, the EVFTA presents opportunities for Vietnam, including access to high-quality, technologically advanced EU transportation products, which can enhance domestic production and support the country’s modernization efforts.

Additionally, the study reveals significant trade diversion, amounting to US$ 361.91 million in Scenario 1, indicating that while EU imports have increased, they have done so at the expense of trade with other regions, posing a

challenge to broader economic gains. Despite this, the EVFTA potentially facilitates the upgrade and development of Vietnam's logistics infrastructure and supports Vietnam's transition and development of the green energy sector within transportation, aligning with global sustainability trends.

Moreover, the study underscores the uneven distribution of benefits among EU member states, with countries like Germany, Slovakia, and Italy experiencing substantial trade creation, while others face intensified competition. The interplay between the EVFTA and RCEP further complicates Vietnam's trade dynamics, as some of the benefits initially gained by the EU are redistributed to RCEP countries like Japan, South Korea, and China in Scenario 2. These findings emphasize the need for Vietnam to carefully navigate its participation in multiple trade agreements, balancing the opportunities presented by the EVFTA with the challenges of trade diversion, intra-EU competition, and competitive pressures from RCEP members. Future research should continue to explore the long-term impacts of these agreements across various sectors, providing a more comprehensive understanding of their economic and strategic implications.

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