

“Vietnam’s participation in the global value chains: An empirical study on the automotive industry”

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VIETNAM'S PARTICIPATION IN THE GLOBAL VALUE CHAINS: AN EMPIRICAL STUDY ON THE AUTOMOTIVE INDUSTRY

Abstract

The automotive industry plays a crucial role in national and global economic development. Vietnam and the ASEAN-5 countries are commented to be active in the automotive international production network but mainly participate in the low-value-added segments of the global value chains (GVC). This study aims to identify Vietnam's position and level of participation in the global automotive value chain and compare them to the other ASEAN-5 nations. The paper uses the orthodox and modern trade-related GVC indicators built by Koopman et al. (2010) to accomplish the research objective. The results show that Vietnam and the ASEAN-5 countries located downstream of the global automotive value chain often have less potential to gain more value-added than the upstream position, despite their high level of participation. Compared to ASEAN-5 countries, Vietnam still needs to catch up. Although Vietnam's auto industry has made many positive changes, it still mainly produces simple products and currently participates in the least added value segment in the global automotive value chain. The underdeveloped support industry in Vietnam is the main cause of this situation. The study makes several practical policy recommendations for Vietnam based on the research findings to improve its position in the production network for the automotive sector in the following years.

Keywords

global value chain, automotive industry, Vietnam, ASEAN-5

JEL Classification

F14, L62, O24

INTRODUCTION

The automotive industry played a vital role in developing global and national economies, including Vietnam. Although Vietnam is actively expanding its involvement in the international production network, the country still depends significantly on foreign input sources and mainly participates in the low-added value segments of the global automotive value chain.

Specifically, although established in 1958, until after the Doi Moi reforms in 1986, the Vietnamese automotive industry began to build the very first development foundations. Since the Doi Moi reforms, the industry has contributed significantly to Vietnam's economic development, accounting for up to 3% of the nation's GDP (National Institute for Finance, 2020; Tuyền, 2021). In the global marketplace, Vietnam has been asserting its rising position. Specifically, in 2021, Vietnam's automotive export turnover ranks third in the ASEAN region with 4.5 billion USD, just behind Thailand and Indonesia (Trade Atlas, n.d.). The prospect of Vietnam's automotive industry is also reflected in the establishment of the "Made in Vietnam" automotive manufacturing brand, Vinfast of Vingroup. Vingroup has set a goal to become the largest automotive manufacturer in Southeast Asia by 2025. This is a



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great ambition; however, they have begun to invest in manufacturing auto parts and accessories, such as internal combustion engines and electric motors, toward more sustainable and environmentally friendly products.

However, Vietnam continues to rely significantly on foreign input imports and mostly manufactures basic auto parts, adding little value to the global automotive value chain. The average localization rate of the Vietnamese auto industry is around 20-30%, much lower than that of countries in the region, such as Thailand, Indonesia, and Malaysia (65-70% on average) (Ministry of Industry and Trade of Vietnam, 2021). The primary cause of this situation is the weakness of the supporting industry, which was unable to sustain the production of the automotive sector. In addition, limitations in the infrastructure system, market size, technology level, and labor quality are significant barriers that limit Vietnamese enterprises from upgrading their positions in the global automotive value chain (Long, 2019).

1. LITERATURE REVIEW

Regarding the concept of the global value chain (GVC), commodity chains, supply chains, and value networks helped to clarify the definition of a GVC. A supply chain relates to the relationship between businesses and their suppliers and customers to provide goods or services at a lower cost (Christopher, 2005). A GVC concentrates on specific value-creating activities within the chain to create competitive advantages (Al-Mudimigh et al., 2004). Potter (1985) first proposed a “value chain” concept. Following that, Hummels et al.’s (2001) empirical research on input-output models linked the phrase “vertical specialization” to GVC. However, three famous GVC research researchers, Stefano Ponte, Gary Gereffi, and Gale Raj-Reichert, synthesized the GVC concept as a comprehensive chain of activities for businesses and employees, bringing a product from conception to end-use. It is carried out on a global scale and is implemented in either one or multiple businesses. Accordingly, Ponte et al. (2019) suggested that a neutral GVC has four fundamental structural components:

- 1) value-added activities or economic functions;
- 2) supply chain;
- 3) output market; and
- 4) supportive environment.

Regarding the concept of the global automotive value chain, Gereffi and Fernandez-Stark (2016) defined it as a set of activities that add value to automotive products, including product design, manufacturing, marketing, and after-sale service. In addition, they proposed a simplified visual representation of the global automotive value chain, including the de-

sign and development of vehicles, parts, components, systems modules, systems integration, final assembly, and finally, replacement parts and recycling.

Regarding the concept of participation at the country/industry level in GVCs, this term was initially proposed by Hummels et al. (2001). Accordingly, a country/industry can engage in the vertical specialization of the production process in two ways, namely

- 1) importing intermediate inputs to produce exported products; and
- 2) exporting intermediate goods utilized as inputs by other countries to create exported goods.

However, Hummels et al. (2001) made two significant presumptions. Firstly, the intensity of using imported inputs is the same for goods produced for export and domestic consumption. However, this assumption is unsuitable for large quantities of outsourcing trade in developing countries. Secondly, all imported intermediate inputs are 100% foreign-sourced. This assumption underestimates the share of domestic value-added in exports, especially for developed nations where their imports often have a large share of their own value-added. Therefore, although Hummels et al. (2001) were among the first to analyze the participation in GVCs at the country/industry level, with these assumptions, their approach was no longer relevant.

Koopman et al. (2010) inherited and overcame the limitations of Hummels et al. (2001) by splitting a country’s total exports into five components, including

- 1) domestic value-added reflected in the exports of final goods and services that the importer directly absorbs;
- 2) domestic value-added reflected in the export of intermediate goods that the importer directly uses to produce the necessary products in the country;
- 3) domestic value-added reflected in the export of intermediate goods that the importer directly uses to produce the good and exports to third countries (indirect value-added exports);
- 4) domestic value-added reflected in the export of intermediate goods used directly by the importer to produce the good and exported back to the source country;
- 5) foreign value-added reflected in total exports.

Accordingly, Koopman et al. (2010) stated that the participation in GVCs at the country/industry level is the participation in the backward linkage representing the imports of foreign inputs/intermediate goods for domestic export, and the participation in the forward linkage representing the export of intermediate goods abroad and continues to be exported to a third country. Those linkages are determined based on the origin of the added value of the intermediate goods as represented in the total exports of the particular country/industry. Kowalski et al. (2015), Muradov (2017), Raei et al. (2019), Banga (2013), and the World Bank (2020) have also applied this approach. This paper also draws on Koopman et al. (2010)'s methodology to determine Vietnam and the ASEAN-5 nations' participation in the global automotive value chain.

According to a recent analysis of ASEAN countries' participation in GVC by the ASEAN-Japan Center (2020), these nations are decreasing their involvement in GVC while accelerating the evolution of the regional value networks. However, most ASEAN countries mainly participated in the backward linkage in the value chain, focusing on importing automotive intermediate goods from abroad. On the other hand, a few case studies of countries in the ASEAN region can be mentioned, such as Kuroiwa's study (2017) investigating Thailand's automotive value chain. The results show that Thailand is strengthening the construction and development of

supporting industries for automotive production. In addition, Sturgeon et al. (2016) have examined the upgrade options for the Philippines in the global automotive value chain, such as manufacturing wire harnesses, enhancing the competitive human resource, supporting effective Export Processing Zone (EPZ) regime, and attracting the leading firms in the industry. However, Athukorala (2021) shows that the Philippines has recently relied heavily on low-end assembly processes in EPZs. This result is rooted in the dualistic incentive structure of the economy that 'arrested' the country's participation in global production networks within the enclave EPZs. Dzulfian (2019) highlighted numerous difficulties Indonesia faced to improve its place in the global automotive value chain, including its inability to capture value, its inefficiency, its neoliberal regime, and harmful policies and institutions.

Finally, studying the case of Vietnam, Schröder (2017) surveyed Vietnamese automotive suppliers to assess the status of these enterprises' participation in the international production network. The results show that the opening of the economy and the strengthening of the signing of bilateral and multi-lateral FTAs have created opportunities for Vietnam to penetrate deeper into the international production network of the automotive industry. However, domestic suppliers' technology level and capacity are minimal, so they can mainly participate in the value chain's simple processing and assembly segments. The country imports most materials for automobile production. Then, the study proposed policy implications related to enhancing the exploitation of FTAs to diversify the supply and consumption markets of automobile products and, simultaneously, heighten the connection to technologically advanced countries to develop Vietnam's automobile industry.

In summary, this study has reviewed the literature on country/industry participation in GVCs and determined to choose the method of Koopman et al. (2010) to assess the participation of Vietnam and ASEAN-5 countries in the global automotive value chain. This method has inherited and overcomes the limitations of previous approaches and has been accepted and applied recently by many prestigious works worldwide. In fact, the previous literature on the status of the participation of Vietnam and ASEAN-5 countries in the global automotive value chain shows the position of these countries. However,

these studies mainly synthesize information to understand the research problem without an orthodox and widely applied approach. The development of the research field on GVCs has provided the method of Koopman et al. (2010), and this is the knowledge gap that this paper seeks to fill to reevaluate the research problem.

2. METHODS

A literature review on the participation of country/industry in the GVC shows that the method of Koopman et al. (2010) is updated and widely used by reputable research. Koopman et al. (2010) classified the participation of country/industry in GVCs through four indicators:

- 1) the backward linkage index;
- 2) the forward linkage index;
- 3) the GVC position index;
- 4) the GVC participation index.

The backward linkage index estimates the import of foreign inputs/intermediate goods for domestic export; the forward linkage index reflects the export of intermediate goods abroad and continues to be exported to a third country; the GVC position index is used to determine the position of a country upstream or downstream in GVCs. If the GVC position > 0 , the added value of exporting intermediate goods is higher than imports, indicating the upstream position. Conversely, if the GVC position < 0 , the added value of importing intermediate goods is higher than exports, illustrating the downstream position. Finally, the GVC participation index indicates a country's level of participation in GVC, illustrating the openness of the economy in the international production network.

$$\text{Backward linkage index} = \frac{FVA}{GE}, \quad (1)$$

$$\text{Forward linkage index} = \frac{DVX}{GE}, \quad (2)$$

$$\text{GVC_Position} = \log\left(1 + \frac{DVX}{GE}\right) - \log\left(1 + \frac{FVA}{GE}\right), \quad (3)$$

$$\text{GVC_Participation} = \frac{DVX}{GE} + \frac{FVA}{GE}, \quad (4)$$

where *FVA* is added-value imports inputs/intermediate goods for domestic export; *DVX* is domestic value-added reflected in the export of intermediate goods that the importer directly uses to produce the goods and continue exports to third countries; and *GE* is total exports of the reference country.

There are numerous data sources to measure country/sector participation in GVCs. They include the World Input-Output Database (WIOD), the Trade Value Added (TiVA) database created by the Organization for Economic Cooperation and Development (OECD), the Multi-Region Input-Output (MRIO) database created by the United Nations Conference on Trade and Development (UNCTAD), and the MRIO database created by the Asian Development Bank (ADB). Each dataset has its advantages and limitations. For example, WIOD is the dataset Koopman et al. (2010) used, but there is no data for Vietnam. UNCTAD's data are only updated to 2017 for the auto industry. Meanwhile, the MRIO developed by ADB is one of the most up-to-date GVC trade data sets, updated to 2021. The MRIO dataset from the ADB includes statistics on 35 industries and services, including the automobile industry, from 62 countries, including Vietnam and the ASEAN-5 countries. Therefore, this is a relevant and updated data set to describe the participation of Vietnam and ASEAN-5 countries in the global automotive value chain.

The research period is from 2010 to 2021. The reason for starting from 2010 is that countries just experienced the financial crisis in 2008–2009 and had a chance to recover in 2010. Although Vietnam's participation in the global automotive value chain is the primary focus of the study, the paper also compares Vietnam's participation to that of the ASEAN-5 nations because of their many similarities to Vietnam in terms of national economic development and the automotive industry.

3. RESULTS

Although Vietnam is located downstream of the global automotive value chain, it has recently experienced an optimistic development trend.

Source: Authors' calculations from the ADB MRIO database (n.d.).

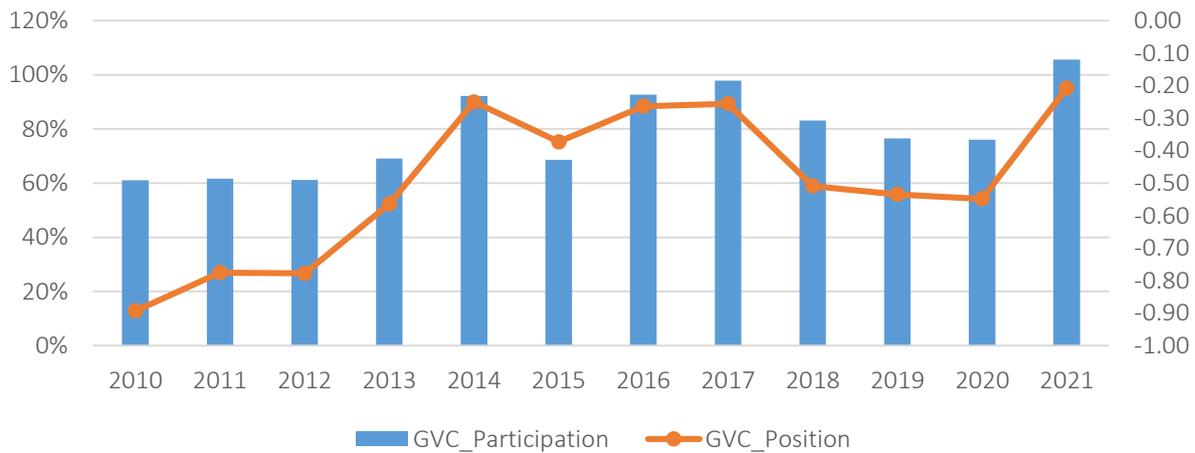


Figure 1. Position and participation Indexes of Vietnam in the global automotive value chain from 2010 to 2021

Vietnam’s position index is lower than 0, indicating that the country is situated downstream, focusing on importing inputs when participating in the global automotive value chain (Figure 1). This proves that Vietnam is still relatively passive in the supply of inputs for the production of the automobile industry. However, Vietnam’s situation significantly improved in 2021 compared to 2010. Particularly, Vietnam’s global automotive value chain dramatically recovered since the 2008–2009 financial crisis (the GVC position index increased from -0.89 in 2010 to -0.25 in 2014). This is mainly contributed by the growth of intermediate product exports (DVX statistics climbed from 7% in 2010 to 33% in 2014) (Figure 2). However, in 2015, Vietnam’s position decreased slightly because the fluctuations in world oil prices limited the international trade of intermediate goods in the automotive industry. Following a modest rebound in 2016 and 2017, Vietnam’s position drastically declined

in the following three years, 2018, 2019, and 2020, as a result of the COVID-19 pandemic’s detrimental effects on the global supply chain disruption. However, in 2021, Vietnam’s position in the global automotive value chain has substantially recovered, mainly due to the contribution of export activities (with DVX figures increasing from 17% in 2020 to 40% in 2021). This encouraging development demonstrates how diligently the Vietnamese government and businesses are working to recover from the COVID-19 pandemic. In the upcoming years, the country expects this growth to continue.

Regarding the level of Vietnam’s participation in the global automotive value chain from 2010 to 2021, Vietnam has markedly improved its role in the international production network of the automotive industry. Specifically, in 2010, Vietnam’s participation index was 61%, but in 2021, this index was 106%. This achievement can include

Source: Authors' calculations from the ADB MRIO database (n.d.).

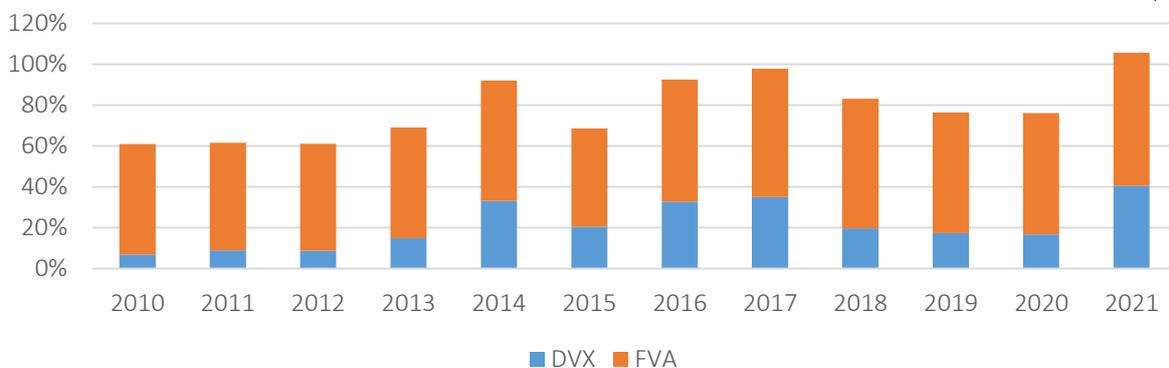


Figure 2. Vietnam’s participation in the backward and forward linkage of the global automotive value chain from 2010 to 2021

Source: Authors' calculations from the ADB MRIO database (n.d.).

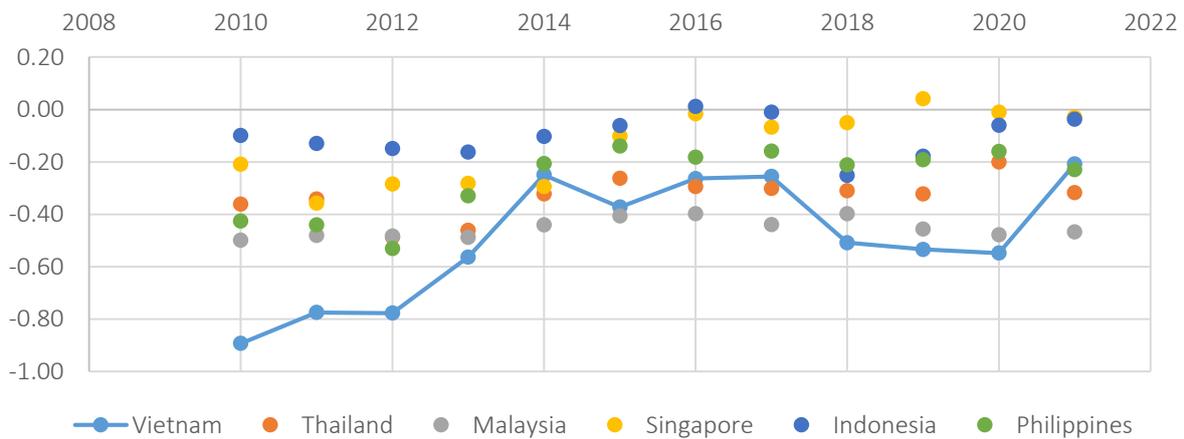


Figure 3. Position indexes of Vietnam and ASEAN-5 countries in the global automotive value chain from 2010 to 2021

the successful signing of several free trade agreements (FTAs) in Vietnam recently, such as the EU-Vietnam Free Trade Agreement – EVFTA (effective on August 1, 2020) and the Vietnam-UK Free Trade Agreement – UKVFTA (effective on December 31, 2020). FTAs are compared to a highway for the growth of Vietnam’s international trade, leading to prospective markets and greater advantages for the nation.

Comparing the positions of Vietnam and ASEAN-5 countries in the global automotive value chain for 2010–2021, these countries are located downstream of the chain; this position usually has less potential to create more added value when participating in the global value chain (Raei et al., 2019; Banga, 2013). However, Singapore and Indonesia are the two countries with the most potential positions, followed by the Philippines,

Thailand, Vietnam, and finally, Malaysia (Figure 3). Vietnam has a low starting point and falls behind the other ASEAN-5 nations regarding its position in the global automotive value chain.

Comparing the level of participation in the global automotive value chain of Vietnam and ASEAN-5 countries in the period 2010–2021, Vietnam is one of the most active countries in the region. For example, Vietnam’s average participation index for the entire period of 2010–2021 is 79%, slightly below Singapore (81%), whereas exceeding Malaysia (74%), Thailand (52%), the Philippines (46%), and Indonesia (29%) (Figure 4).

Regarding the structure of Vietnam’s and the ASEAN-5 countries’ participation in the global automotive value chain between 2010 and 2021, it can be seen that these nations mostly engage

Source: Authors' calculations from the ADB MRIO database (n.d.).

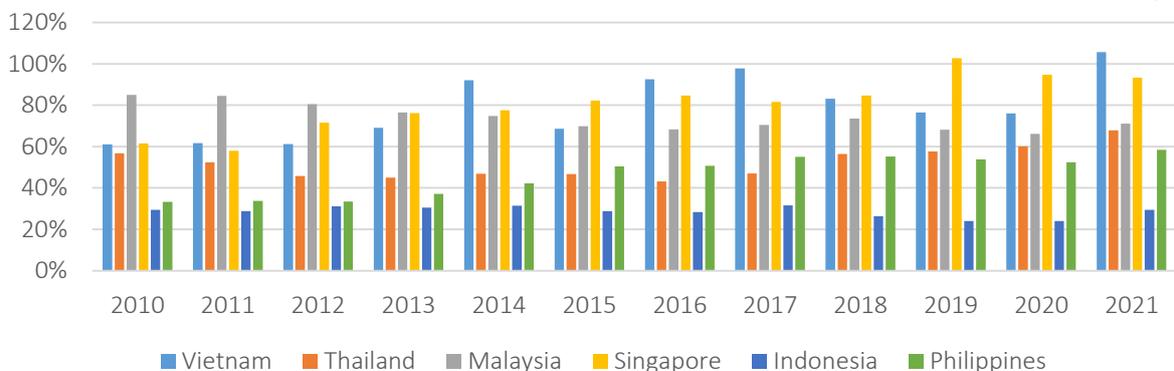


Figure 4. Participation indexes of Vietnam and ASEAN-5 in the global automotive value chain from 2010 to 2021

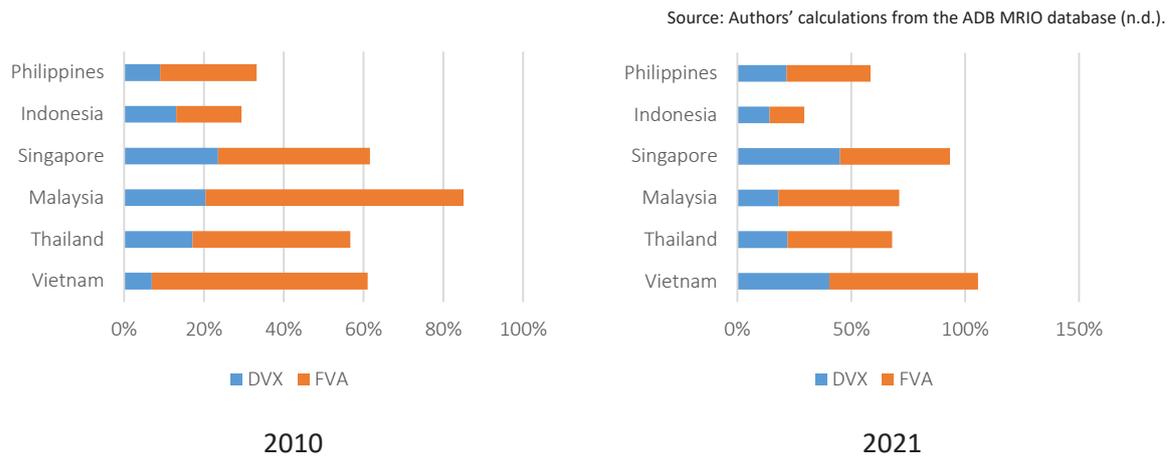


Figure 5. Participation of Vietnam and ASEAN-5 countries in the global automotive value chain in 2010 and 2021

in backward linkages or import inputs for the manufacturing of the automobile sector (Figure 5). However, Vietnam and the ASEAN-5 nations have been boosting exports while restricting imports of raw materials for the automotive industry, signifying an improvement in their position in the global value chain.

4. DISCUSSION

The results show that Vietnam is downstream of the global automotive value chain (Position Index < 0). This position often has less potential to gain more value-added than the upstream. Vietnam's main activities in the value chain are importing inputs for automotive production. This result is consistent with the previous statements by the Ministry of Industry and Trade of Vietnam (2021). Vietnam will continue to hold a downstream position shortly but will move more upstream, a position with the ability to create more value when joining the global automotive value chain.

The primary cause of Vietnam's reliance on imported inputs is its weak domestic supporting sector, which is incapable of supplying for production and export of the automobile industry (The Ministry of Industry and Trade of Vietnam, 2021). The average localization rate of the Vietnamese auto industry is around 20-30%, much lower than that of countries in the region, such as Thailand, Indonesia, and Malaysia (65-70% on average). Domestic businesses preeminent manufacture basic components with little added value, such as

bumpers, tires, wires, radiator covers, windshield adhesives, water fuel pipelines, radiator covers, mud, seats, bumpers, batteries, wheels, exhaust pipes, or air conditioners. Only a few companies invest in tire and body stamping lines (Lam, 2022). As a result, manufacturers must import inputs for automotive production, leading to rising manufacturing costs and decreasing competitiveness. Consequently, due to lower prices than assembled goods, the quantity of CBU-imported cars from other ASEAN countries has recently increased dramatically (The Vietnam Customs, 2022).

Several reasons make it difficult for the supporting industry in Vietnam to develop. Firstly, the small size of the Vietnamese market makes it hard to establish an active supporting industry. It is challenging for the small market size to take advantage of the economies of scale since the supporting industry frequently requires large investment expenditures, including human and financial resources (Thuy, 2022). As a result, it will be more economical for domestic manufacturers to import inputs from abroad. Secondly, the connection between foreign and domestic businesses is still relatively faint. It is hard for domestic firms with limited capacity and innovation resources to participate in manufacturing high-value products in large multinational global production networks. In addition, international brands frequently collaborate with longtime foreign partners to maintain a more effective and consistent supply capacity (The Ministry of Trade and Trade of Vietnam, 2022). Thirdly, using abundant labor resources, the nature of specialization in the global produc-

tion network has made Vietnam and other developing nations “vicious” in processing and assembling goods.

Exploiting this advantage has resulted in a positive and promising development for Vietnam’s economy and manufacturing sectors, especially the automobile sector. Taking advantage of cheap labor has become less appealing to foreign investors in today’s global upheavals context, such as the COVID-19 pandemic, increased political tension between nations, high protectionism, and the practical impacts of digital technologies (The OECD, 2019; Dachs & Seric, 2019; The World Bank, 2020). Recent years have seen the emergence and enhancement of the phenomena known as “back shoring” or “reshoring” by numerous significant firms across the globe. As a result, Vietnam urgently has to create plans for effective and sustainable development that will allow it to benefit from current advantages while at the same time promoting the development of supporting industries to be more proactive in input supplying, enhancing the added value obtained when participating in the global automotive value chain.

Vietnam has a relatively high level of involvement in the global automotive value chain (the participation index is around 79%). This demonstrates that Vietnam is actively developing its national brand on the global market. This outcome aligns with economists’ beliefs that Vietnam dynamically supports global economic integration. Indeed, Vietnam has recently successfully signed two free trade agreements, including the EVFTA and the UKVFTA.

Comparing Vietnam’s position and level of participation with ASEAN-5 countries in the global automotive value chain, although Vietnam participates very enthusiastically, it still needs to progress. This result is consistent with the assessment made by the Ministry of Industry and Trade of Vietnam (2021), which notes that Vietnam’s automotive industry still needs to catch up with those of the other ASEAN-5 countries. For instance, whereas the localization rate for the Vietnamese auto sector is around 20%, it is between 65-70% in places like Thailand, Indonesia, and Malaysia. However, Vietnam

and ASEAN-5 countries are still downstream of the global automotive value chain, mainly participating in importing inputs for automobile production. The impact of foreign direct investment (FDI) is the primary cause of this situation. FDI enterprises usually use the host nation as a manufacturing base and benefit from low labor costs rather than using local resources (Kowalski et al., 2015). Consequently, when a country attracts more FDI, its import turnover typically increases, leading to the downstream position in the value chain.

On the other hand, the difference in participating segments in the global automotive value chain of Vietnam and ASEAN-5 countries is also notable. Specifically, while Indonesia and Thailand are regional hubs for famous brands’ car production, the Philippines and Vietnam focus on purely Completely Knocked Down (CKD) assembly and manufacture of simple parts and components due to lower technological capacity and limited domestic market. For example, the Philippines mainly manufactures wiring systems, electrical components, aluminum components, and chassis systems; Vietnam mainly assembles complete units (CBUs). Meanwhile, Singapore focuses on automotive electronics, regional sales and distribution, and, more recently, driverless vehicles (The ASEAN-Japan Center, 2020).

The global automotive value chain is dynamic and constantly evolving, especially regarding technology and innovation in product development and production processes. Regarding product development, ASEAN is moving toward “green technology.” This trend is related to the increase in the electrification of many parts and components and the increase in the use of electric cars. Indonesia is focusing on manufacturing its low-cost green car (LCGC) program. Malaysia is promoting its auto sector as an energy and efficiency car hub, while Thailand is trying to position itself as a global hub for green car production. The Philippines also promotes green technology by providing tax advantages to companies producing and importing hybrid and electric cars. These new orientations will undoubtedly significantly affect how the regional and global automotive value chains are organized soon.

CONCLUSION

The study aims to assess Vietnam's global automotive value chain and compare its data to the other ASEAN-5 nations using the model built by Koopman et al. (2010). The results show that Vietnam and the ASEAN-5 nations are situated downstream of the global automotive value chain and concentrate on importing raw materials for the production of the automotive industry. When engaging in GVCs, this position typically has a lower potential for adding value to the nation or industry. However, the study's findings demonstrate that, in recent years, Vietnam and the ASEAN-5 nations have increased the growth of intermediate product exports and restrictions on imports, signifying an improvement in their position in the global automotive value chain. Additionally, Vietnam and the ASEAN-5 nations participate in the global automotive value chain at quite a high level, highlighting the importance of these nations and their development potential within the global production network of the automobile industry. However, Vietnam still needs to catch up to other countries in the ASEAN-5 region, especially Thailand, Malaysia, and Indonesia, in the production and export of automobiles. Vietnam participates mainly in the low-added value segment, producing simple auto components due to the significant limitation in the capacity of the domestic supporting industry.

The paper has determined Vietnam's position and level of participation and compared it with ASEAN-5 countries. Although Vietnam participates very actively in the international production network, it is mainly involved in the low value-added process and heavily depends on input imports. This is the problem facing the automobile industry in many other developing nations throughout the world when they are primarily utilizing the benefit of abundant labor, and it is challenging to transition to segments that contribute more value to the GVCs. In order to improve Vietnam's participation in the global automotive value chain and draw lessons for other developing countries, the study proposes some practical policy implications. It will be wise for Vietnam to stimulate worldwide economic integration through free trade agreements to diversify trading partners and reduce the risk in today's ongoing global upheaval. The expansion of the domestic market will also be facilitated by expanding to the global market, setting the foundation for the growth of the domestic supporting industry in the automobile sector. In addition, it is advisable to take advantage of foreign direct investors and heighten their commitment to developing the domestic supporting sector.

AUTHOR CONTRIBUTIONS

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Formal analysis: Linh Nguyen Thi Phuong, Anh Vu Hai.

Funding acquisition: Linh Nguyen Thi Phuong, Anh Vu Hai.

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Methodology: Linh Nguyen Thi Phuong.

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Software: Linh Nguyen Thi Phuong, Anh Vu Hai.

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Writing – review & editing: Linh Nguyen Thi Phuong, Anh Vu Hai.

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