

LOGISTICS DEVELOPMENT IN VIETNAM, 2010–2024

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ABSTRACT

This study examines the development of logistics in Vietnam over the 2010–2024 period using secondary data from the World Bank and UNCTAD. Rather than relying on a single indicator, the study combines three groups of measures—logistics performance, international trade, and transport and maritime connectivity—to provide a multidimensional view of logistics development. The methods include descriptive statistics, trend analysis, and compound annual growth rate (CAGR) calculations. The results show that Vietnam’s total merchandise trade increased from approximately USD 157.08 billion in 2010 to USD 785.34 billion in 2024, corresponding to a CAGR of about 12.18% per year. Container port throughput rose from approximately 6.43 million TEUs to 20.78 million TEUs, representing a CAGR of about 8.74% per year. Vietnam’s Logistics Performance Index (LPI) score increased from 2.96 in 2010 to 3.30 in the 2023 assessment, although the trajectory fluctuated across assessment rounds. At the same time, Vietnam’s international liner shipping connectivity improved substantially. The findings indicate that logistics development in Vietnam has occurred across several dimensions, but the pace of improvement has not been uniform across indicators. The study contributes empirical evidence on Vietnam’s long-term logistics development and highlights the value of a multidimensional indicator framework for assessing logistics performance at the national level.

Keyword: logistics; logistics performance; international trade; container transport; liner shipping connectivity; Vietnam.

1. INTRODUCTION

In the context of globalization and the expansion of global value chains, logistics has become increasingly important in linking production, circulation, and trade. Logistics development not only supports transportation, warehousing, and distribution but also contributes to market access and the competitiveness of an economy. In Vietnam, alongside deeper international economic integration, logistics has become a service sector closely associated with the development of trade, transport infrastructure, and import–export activities [6]

During 2010–2024, Vietnam’s international trade expanded substantially. According to UNCTAD (2025), merchandise exports increased from USD 72.237 billion in 2010 to USD 404.824 billion in 2024, while imports rose from USD 84.839 billion to USD 380.515 billion. Total merchandise trade reached approximately USD 785.339 billion in 2024, about five times the 2010 level. In parallel with this trade expansion, Vietnam’s logistics sector also recorded growth in market size and service capacity. According to the Ministry of

Industry and Trade, the sector has recently grown by approximately 14–16% per year, with an estimated market size of USD 40–42 billion annually [8]. Vietnam’s Logistics Performance Index (LPI) score was 3.3 in 2023, placing the country in rank group 43 in the World Bank assessment [16]. In addition, Vietnam’s container port throughput reached approximately 20.78 million TEUs in 2024 [11]. These indicators suggest that logistics activity expanded alongside the growth of trade and freight transport.

However, logistics development cannot be assessed solely through sectoral growth rates or market size. Logistics is multidimensional, involving infrastructure quality, customs efficiency, logistics competence and service quality, tracking and tracing, timeliness, and the ability to arrange international shipments—dimensions also incorporated into the World Bank’s LPI framework [16]. Despite notable progress, Vietnam’s logistics sector continues to face challenges, including relatively high logistics costs, limited linkages between logistics providers and manufacturing and trading firms, and the

modest scale and capacity of many domestic logistics enterprises [6]. Moreover, the 2010–2024 period encompasses major changes in the trade and supply-chain environment, including deeper trade integration, disruptions during the COVID-19 pandemic, and the subsequent recovery of trade. Examining logistics development over a relatively long period and through multiple indicators can therefore provide a more comprehensive perspective than an assessment based on a single point in time or a single index.

Existing studies and reports have examined Vietnam's logistics sector from various perspectives, including logistics performance, infrastructure, transport, trade, and business activity. Nevertheless, integrating logistics, trade, and transport indicators within a common long-term analytical framework can provide additional empirical evidence on the evolution of logistics in Vietnam. This approach makes it possible to identify not only changes in individual indicators but also the way logistics has evolved in association with trade expansion and transport activity. The specific research gap associated with this approach is identified through the review of prior studies below.

Against this background, this study, entitled “Logistics Development in Vietnam, 2010–2024: Evidence from Logistics, Trade, and Transport Indicators,” analyzes the development trajectory of Vietnam's logistics sector using secondary data. It pursues three objectives: (i) to identify trends in logistics development in Vietnam during 2010–2024; (ii) to analyze changes in trade and transport indicators over the same period; and (iii) to examine the association between logistics development and the expansion of trade and transport activity. Data are drawn primarily from the World Bank, UNCTAD, and official Vietnamese statistical sources. The study is expected to provide updated empirical evidence on changes in Vietnam's logistics system over more than a decade and to support discussion of remaining challenges and future development directions.

2. LITERATURE REVIEW AND THEORETICAL BACKGROUND

1.1. Concept and role of logistics

1.1.1. Concept

The 2005 Commercial Law was the first Vietnamese commercial law to regulate logistics

services directly. Under Article 233 of Commercial Law No. 36/2005/QH11, logistics services are defined as commercial activities whereby traders organize the performance of one or more activities related to goods in return for remuneration [9]

Under this provision, logistics services may include receiving goods, transportation, warehousing, storage, customs procedures, other documentation procedures, consultancy, packaging, marking and coding, delivery, and other services related to goods [9]

From a supply-chain management perspective, logistics can be approached in both a narrow and a broad sense. In the narrow sense, logistics focuses on transportation, freight forwarding, warehousing, storage, and cargo handling. In the broader sense, logistics encompasses the planning, organization, and control of flows of goods and information from production inputs to the final consumer.

In the narrow sense, logistics services are associated with operations that directly support the physical movement of goods, such as transportation, freight forwarding, warehousing, storage, and related procedures. In the broad sense, logistics is a coordinated system of activities designed to ensure the efficient movement of materials, goods, and information from sources of supply to markets.

Article 233 is open-ended because it also covers “other services related to goods”; therefore, the scope of logistics services is not limited to freight forwarding or transportation alone [9]

1.1.2. Role of logistics

At the macroeconomic level, logistics services contribute to socioeconomic efficiency. Logistics consists of continuous and interrelated activities that connect production, circulation, and distribution. Each activity in the chain has a distinct function and cost implication; better coordination can therefore improve the overall efficiency of resource flows.

Logistics also contributes to national competitiveness. As production becomes increasingly fragmented across borders and competition intensifies, logistics performance can become an important source of competitive advantage. Logistics facilitates economic transactions and supports the continuous

movement of goods required for the economy to operate in a coordinated manner.

At the firm level, logistics can improve managerial efficiency, reduce production and distribution costs, and strengthen competitiveness. Effective logistics management supports decisions concerning sourcing, replenishment quantities and timing, transport modes and routes, locations, and the movement of intermediate products, thereby helping firms streamline operations and control costs.

Logistics services can also reduce costs in circulation and distribution and increase the business value generated by transport and freight-forwarding firms. Compared with conventional transport and forwarding, logistics services involve a broader and more complex set of coordinated activities.

1.2. Indicators of logistics development

Because logistics is multidimensional, its development should be assessed using several groups of indicators. In international comparative research, the World Bank's LPI is among the most widely used measures. It provides a relative assessment of national logistics performance through dimensions related to customs, infrastructure, international shipments, logistics competence and service quality, tracking and tracing, and timeliness [16]

However, the LPI has an important limitation for time-series research because it is not published annually. During the period covered by this study, conventional LPI observations are available only for selected years. Consequently, the LPI alone cannot continuously represent the evolution of Vietnam's logistics system throughout 2010–2024.

To address this limitation, indicators of transport activity and cargo flows can be used as complements. Container port throughput, for example, captures an important aspect of the scale of freight logistics and the capacity to handle containerized cargo. Liner shipping connectivity, meanwhile, reflects the extent to which a country is connected to the international container shipping network. Research on global container shipping networks also indicates that port connectivity and the structure of trading communities are closely related to the evolution

of maritime transport systems (Jarumaneeroj et al., 2024).

For Vietnam, combining the LPI with transport, container-throughput, and trade indicators therefore offers a more appropriate approach to describing long-term logistics development. The LPI captures dimensions of quality and efficiency, whereas transport and trade indicators reflect the scale of activity and the connectivity of the logistics system.

1.3. Relationship between logistics and international trade

The relationship between logistics performance and international trade has received considerable attention in empirical research. In theory, an efficient logistics system can reduce time costs and other frictions in the movement of goods, thereby facilitating exports and imports. Conversely, trade expansion generates greater demand for transportation and logistics services, encouraging investment and capacity expansion within the logistics system.

At the international level, Jayathilaka et al. (2022) analyzed data for 142 countries for 2007, 2010, 2012, 2014, 2016, and 2018 using panel regression. Their results indicate a positive relationship between the LPI and net exports globally and in several regions, including Asia. This evidence suggests that logistics performance is significantly associated with economies' participation in international trade.

Recent studies further support this relationship. Wang et al. (2024), examining countries participating in the Belt and Road Initiative, found that international logistics performance significantly affects import and export trade. Evidence from Korea also indicates that individual LPI components are associated differently with trade across product groups, implying that the role of logistics may not be homogeneous across industries [1]

These findings suggest that logistics research should move beyond a single aggregate indicator. Components of logistics performance and characteristics of the transport system may be associated with trade in different ways, which is particularly relevant for highly open economies that depend substantially on international transport networks.

1.4. Studies on logistics and trade in Vietnam

In Vietnam, the relationship between logistics performance and trade has been examined in several recent studies. Hoang and Pham (2022) employed a gravity model and panel data covering Vietnam and 19 trading partners over 2005–2018. Their results confirm a statistically significant relationship between logistics performance and Vietnam's international trade.

At the export level, Le (2022) examined the relationship among exports, logistics performance, and regional economic integration in Vietnam at the sectoral and subsectoral levels. The analysis suggests that the role of logistics may differ across product groups, highlighting the importance of considering trade composition when evaluating logistics effects.

More recently, Vu and Doan (2024) used Vietnam's bilateral export data with 158 trading partners over 2007–2018 and estimated a gravity model using the Poisson Pseudo-Maximum Likelihood (PPML) method. Their results show that the logistics performance of both Vietnam and importing countries has a positive and significant association with Vietnam's exports. At the component level, tracking and tracing, logistics competence and service quality, customs efficiency, and timeliness were found to play significant roles.

On the import side, Vu and Eum (2024) used bilateral trade data for 2007–2022 and an extended gravity model to examine the “logistics bottleneck effect.” Their findings suggest that lower logistics performance between Vietnam and its partners can create bottlenecks for imports, indicating that trade efficiency depends not only on Vietnam's own logistics capacity but also on the logistics capabilities of partner economies.

Taken together, these studies indicate that the logistics–trade relationship may vary according to trade-flow characteristics, trading partners, and estimation methods. The results should therefore be interpreted within Vietnam's specific context and the scope of the data employed.

Overall, empirical studies on Vietnam provide relatively consistent evidence of an association between logistics performance and international trade. However, most focus on estimating the effect of the LPI on exports or imports, typically using bilateral trade data and gravity models.

While this approach is appropriate for estimating trade effects, it does not directly describe the long-term evolution of Vietnam's logistics system through multiple groups of indicators.

1.5. Research gap and analytical framework

Three issues emerge from the literature review. First, much empirical research focuses on causal relationships or statistical associations between logistics performance and trade, with the LPI commonly used as a proxy for logistics. Yet logistics is multidimensional and the LPI is not published annually; reliance on this index alone may therefore fail to capture the full evolution of logistics over time.

Second, studies on Vietnam have primarily used bilateral trade data to evaluate the influence of logistics on exports or imports. Less attention has been given to the simultaneous long-term evolution of logistics performance, trade scale, and transport activity within a unified analytical framework.

Third, the period after 2018 is particularly relevant to Vietnam's logistics sector because it includes major disruptions to trade and supply chains during the COVID-19 pandemic, the post-pandemic recovery, and continued expansion of import–export activity. Extending the observation period through 2024 provides more recent evidence on how logistics, trade, and transport indicators evolved during a period of substantial change.

Accordingly, this study does not conceptualize logistics solely through the LPI or focus exclusively on estimating the effect of logistics on exports. Instead, it develops an analytical framework comprising three groups of indicators: (i) logistics performance and capacity; (ii) international trade; and (iii) freight transport and connectivity. These indicators are examined over 2010–2024 to identify long-term trends, notable changes, and associations among the indicator groups.

This approach adds a temporal perspective to the analysis of logistics development in Vietnam while avoiding the equation of “logistics development” with changes in a single index. It thereby seeks to provide updated empirical evidence on Vietnam's logistics development in association with the expansion of trade and transport activity.

3. DATA AND METHODOLOGY

This study adopts a quantitative approach based on secondary data to examine logistics development in Vietnam during 2010–2024. Data are collected primarily from the World Bank’s World Development Indicators (WDI) and Logistics Performance Index (LPI), the UNCTADstat Data Hub, and selected official statistical reports from Vietnam. The year 2024 is used as the endpoint because it is the most recent year for which the key indicators are relatively complete.

The indicators are divided into three groups: (i) logistics, represented by the Logistics Performance Index (LPI); (ii) trade, including merchandise exports (EXP), merchandise imports (IMP), and total merchandise trade (TRADE); and (iii) transport and connectivity, including container port throughput (CPT) and the Liner Shipping Connectivity Index (LSCI). The LPI captures dimensions of logistics performance such as customs, infrastructure, international shipments, logistics competence and service quality, tracking and tracing, and timeliness [16]. Because the LPI is not published annually, the study uses only observed assessment years and does not interpolate missing years.

Table 1. Variables and data sources used in the study

Group	Indicator	Symbol	Unit	Source
Logistics	Logistics Performance Index	LPI	Score	World Bank
Trade	Merchandise exports	EXP	USD billion	UNCTAD
Trade	Merchandise imports	IMP	USD billion	UNCTAD
Trade	Total merchandise trade	TRADE	USD billion	UNCTAD
Transport	Container port throughput	CPT	Million TEUs	UNCTAD/WDI
Connectivity	Liner Shipping	LSCI	Index	UNCTAD

	Connectivity Index		points	
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The study uses descriptive statistics, trend analysis, and growth-rate measures to assess changes in the indicators during 2010–2024. Annual growth rates and compound annual growth rates (CAGR) are calculated for continuous series to identify the magnitude of change over the full period. In addition, correlation analysis is specified to examine statistical associations between trade and transport indicators, particularly between container throughput and exports, imports, and total trade.

Given the relatively small number of annual observations and the discontinuous availability of some indicators, the study does not seek to establish causal relationships. Any correlations are interpreted as statistical associations and are considered together with trend analysis to provide empirical evidence on Vietnam’s logistics development during the study period.

4. RESULTS

4.1. Trends in the development of Vietnam’s international trade

Alongside export growth, government support measures and improvements in global supply chains contributed to the strong development of Vietnam’s logistics sector in 2024. Total cargo throughput at seaports was estimated to increase by approximately 14%, reaching more than 570 million tonnes during the period reported; dry bulk/general cargo and containerized cargo accounted for substantial shares, with handled volumes of more than 321 million tonnes and 191 million tonnes, respectively. In addition, the expansion of industrial parks, which play a central role in export supply chains, contributed to growing demand for logistics services. Vietnam’s logistics sector has also undergone important changes with the support and accompanying measures of the Government.

In recent years, Vietnam’s logistics sector has recorded an annual growth rate of approximately 14–16%, with an estimated market size of USD 40–42 billion per year. According to the World Bank ranking cited in the source, Vietnam ranked 43rd among 155 countries in logistics performance and was among the five leading ASEAN countries. In 2023, 7,919 new logistics

enterprises were established nationwide, while the market was reported to comprise more than 5,000 logistics enterprises. Some Vietnamese firms have demonstrated regional and international competitiveness. Vietnam was also reported to lead ASEAN in the number of enterprises licensed to provide maritime transport services to and from the United States. During the first nine months of 2024, nearly 6,500 enterprises in logistics-related activities were newly registered, with total registered capital of VND 36.55 trillion and nearly 28,900 registered employees. Compared with the same period in 2023, the number of enterprises increased by 13.5% and registered employment by 18.3%, whereas registered capital decreased by 11.3%.

The results show that Vietnam's international trade expanded strongly during 2010–2024. According to UNCTAD data, merchandise exports increased from USD 72.237 billion in 2010 to USD 404.824 billion in 2024, representing an increase of approximately 5.6 times. Over the same period, imports rose from USD 84.839 billion to USD 380.515 billion, or approximately 4.5 times [11], [12]

Total merchandise trade consequently increased from approximately USD 157.08 billion in 2010 to USD 785.34 billion in 2024, or nearly fivefold. Calculations in this study indicate that the CAGR of exports was approximately 13.10%, imports 11.32%, and total trade 12.18% over 2010–2024. The trade balance also shifted from a deficit of USD 12.60 billion in 2010 to a surplus of USD 24.31 billion in 2024.

Table 2. Selected trade indicators of Vietnam, 2010–2024

Indicator	2010	2015	2024	CAGR 2010–2024
Exports (USD billion)	72.24	162.07	404.82	13.10 %
Imports (USD billion)	84.84	165.61	380.52	11.32 %
Total trade (USD billion)	157.08	327.68	785.34	12.18 %
Trade balance	–12.60	–3.55	24.31	–

(USD billion)				
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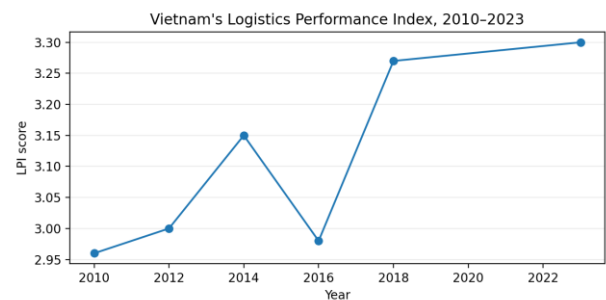
Source: Authors' compilation and calculations based on UNCTAD data.

The results indicate that trade expansion was one of the most prominent features of Vietnam's economy during the study period. In particular, average export growth exceeded import growth, alongside a transition in the trade balance from deficit to surplus.

4.2. Changes in logistics performance

Vietnam's LPI indicates a long-term improvement in logistics performance, although the trajectory was not continuously upward across assessment rounds. The score increased from 2.96 in 2010 to 3.00 in 2012 and 3.15 in 2014, declined to 2.98 in 2016, then rose to 3.27 in 2018 and 3.30 in the 2023 LPI assessment [16]

Figure 1. Vietnam's Logistics Performance Index



Source: World Bank, Logistics Performance Index.

Compared with 2010, the LPI score in the 2023 assessment was 0.34 points higher, equivalent to an improvement of approximately 11.5%. Nevertheless, the pattern confirms that logistics performance did not improve linearly. The decline from 3.15 in 2014 to 2.98 in 2016, followed by recovery to 3.27 in 2018, demonstrates that evaluating logistics development on the basis of a single year or a single index may not fully capture changes in the sector.

Because the World Bank does not publish the LPI annually, the study does not interpolate missing observations and does not use the LPI as an annual time series in the correlation analysis.

4.3. Expansion of container transport and maritime connectivity

Container transport activity also expanded substantially during the study period. UNCTAD data show that Vietnam's container port throughput was approximately 6.43 million TEUs in 2010 and 10.62 million TEUs in 2015. By 2024, container port throughput had reached approximately 20.78 million TEUs [11], [12]

Thus, container throughput in 2024 was approximately 3.2 times its 2010 level. Calculations based on the beginning and end points indicate a CAGR of approximately 8.74% per year for container throughput over 2010–2024.

Table 3. Changes in selected indicators, 2010–2024

Indicator	2010	2024	Change	CAGR
Exports	USD 72.24 bn	USD 404.82 bn	5.60 times	13.10 %
Imports	USD 84.84 bn	USD 380.52 bn	4.49 times	11.32 %
Total trade	USD 157.08 bn	USD 785.34 bn	5.00 times	12.18 %
Container throughput	6.43 mn TEUs	20.78 mn TEUs	3.23 times	8.74%
LPI*	2.96	3.30	+11.5 %	–

*LPI compares the 2010 assessment with the 2023 LPI assessment; the latter is not a 2024 observation.

Source: Authors' calculations based on World Bank and UNCTAD data.

In addition to the increase in container throughput, Vietnam's connectivity with the international maritime transport network improved. According to UNCTAD, Vietnam's Liner Shipping Connectivity Index increased by approximately 30% from the first quarter of 2019 to the first quarter of 2024. Vietnam moved from 14th to 7th position in UNCTAD's global comparison of liner shipping connectivity. This represented the largest improvement among the ten highly connected countries analyzed by UNCTAD (Pallis et al., 2024).

This result indicates that Vietnam's logistics development during the study period was reflected not only in the volume of cargo handled but also in the country's increasing integration into the international container shipping network.

3.4. Association between trade and logistics activity

A comparison of the indicators shows that trade and logistics activity in Vietnam expanded concurrently during 2010–2024. Total merchandise trade increased approximately fivefold, while container port throughput increased by more than 3.2 times. At the same time, the LPI improved from 2.96 to 3.30 between the 2010 and 2023 assessments, and maritime connectivity improved substantially.

However, the growth rates of the indicators were not identical. The CAGR of total trade was approximately 12.18% per year, exceeding the approximately 8.74% CAGR of container throughput. This indicates that the monetary value of trade grew faster than the volume of containers handled at ports. Because trade indicators are measured in monetary value whereas container throughput is measured in TEUs, this difference in growth rates cannot be interpreted directly as a change in logistics efficiency. The two indicators capture different dimensions of trade and logistics development.

In terms of overall trends, trade expansion occurred in parallel with rising container throughput and improved maritime connectivity. This pattern is consistent with the argument that growing international cargo flows create greater demand for transport, ports, warehousing, and logistics services. At the same time, improvements in logistics capacity and transport connectivity may facilitate trade.

Nevertheless, the study does not interpret this co-movement as evidence of causality. Trade and transport series both display upward trends over time, meaning that correlations in levels may partly reflect common trends. Establishing causal relationships between logistics and trade would require a more extensive dataset and an econometric design beyond the scope of the present study.

4.5. Effects of periods of disruption on logistics development

The 2010–2024 period was not characterized by uniform growth. In particular, the COVID-19 pandemic caused major disruptions to global transport and supply chains. These shocks demonstrate that the ability to maintain cargo flows and connectivity with international transport networks is an important dimension of logistics development, alongside market size and growth rates.

Following the pandemic, Vietnam's trade recovered and continued to expand. In 2024, merchandise exports reached USD 404.82 billion, an increase of 14.4% from the previous year, while total merchandise trade reached USD 785.34 billion (UNCTAD, 2025). Together with container throughput of 20.78 million TEUs and improvements in the LSCI, these results indicate that Vietnam's logistics system continued to expand in the post-COVID-19 period.

4.6. Summary of findings

The analysis identifies four principal features of Vietnam's logistics development during 2010–2024.

First, the scale of international trade expanded substantially, with total merchandise trade increasing approximately fivefold and recording a CAGR of about 12.18% per year.

Second, container transport activity expanded from approximately 6.43 million TEUs in 2010 to 20.78 million TEUs in 2024, corresponding to a CAGR of about 8.74% per year.

Third, logistics performance improved over the long term but not continuously, as reflected in the movement of the LPI from 2.96 in 2010 to 3.30 in the 2023 assessment.

Fourth, international liner shipping connectivity improved markedly, with Vietnam's LSCI increasing by approximately 30% from the first quarter of 2019 to the first quarter of 2024.

Overall, the results show that logistics development in Vietnam occurred across several dimensions, including cargo-flow scale, logistics performance, and international transport connectivity. Differences in the pace and pattern of change across indicators reinforce the need to assess logistics development through a system of indicators rather than a single measure.

5. DISCUSSION

The findings show that logistics development in Vietnam during 2010–2024 occurred alongside strong growth in international trade and freight transport. However, the magnitude of change differed across indicator groups. Logistics development should therefore be understood as a multidimensional process encompassing the scale of activity, logistics performance, and connectivity with international transport networks.

5.1. Logistics development and trade expansion

One notable result is that Vietnam's total merchandise trade increased approximately fivefold during 2010–2024, while container port throughput increased by more than three times. The parallel movement of these indicators suggests that trade expansion occurred alongside growing demand for transport, ports, and logistics services.

This finding is consistent with international evidence reported by Jayathilaka et al. (2022). Using data for 142 countries, the authors identified a positive relationship between the LPI and net exports globally and in Asia. Wang et al. (2024) likewise found that improved logistics performance is positively associated with import and export trade among Belt and Road Initiative countries. These findings support the broader proposition that logistics and trade are closely interconnected in the process of international economic integration.

For Vietnam, Vu and Eum (2024), using bilateral trade data for 2007–2022, found that logistics bottlenecks between Vietnam and its partners significantly affect imports. This suggests that trade efficiency depends not only on domestic logistics capacity but also on connectivity and logistics performance across the wider trading chain.

The present study, however, does not treat the co-movement between trade and logistics as evidence of causality. Trade growth can increase demand for logistics, while improvements in logistics can facilitate trade. The findings are therefore more appropriately interpreted as evidence of a reciprocal association between the two domains.

5.2. Trade grew faster than container throughput

Another notable finding is that the CAGR of total merchandise trade exceeded the growth rate of container port throughput. This difference must be interpreted cautiously because the two indicators use different units: trade is measured in monetary value, whereas container throughput is measured in TEUs.

Accordingly, faster growth in trade value than in TEUs does not necessarily mean that container transport capacity developed more slowly than trade. The difference may reflect changes in commodity prices, the composition of imports and exports, the average value of goods per container, a shift toward higher-value products, and the role of other modes of transport.

This result also demonstrates why container throughput alone should not be used as a proxy for overall logistics development. Container port traffic captures the scale of an important component of cargo flows, but it does not directly measure service quality, customs efficiency, logistics costs, or supply-chain management capabilities. Combining this indicator with the LPI and LSCI therefore provides a more comprehensive perspective.

5.3. Logistics performance improved but remained uneven

The LPI results indicate that Vietnam's score improved over the long term, from 2.96 in 2010 to 3.30 in the 2023 assessment, but fluctuated across assessment rounds. In particular, the LPI declined between 2014 and 2016 before increasing again in subsequent assessments.

This pattern indicates that growth in trade and transport scale does not automatically translate into continuous improvement in logistics performance. The LPI encompasses multiple dimensions, including customs efficiency, infrastructure, international shipments, logistics competence and service quality, tracking and tracing, and timeliness. Uneven progress across these components may therefore influence the aggregate score.

This finding is relevant to the assessment of Vietnam's logistics sector. Reliance only on market size, the number of firms, or cargo volumes may lead to an incomplete assessment of

development quality. Conversely, relying solely on the LPI is also problematic because the index is not published annually. A combination of indicator groups is therefore better suited to the characteristics of Vietnam's available data.

5.4. The growing role of maritime connectivity

The improvement in the LSCI is another notable result. Vietnam's liner shipping connectivity increased by approximately 30% between the first quarter of 2019 and the first quarter of 2024, indicating deeper integration into the international container shipping network (Pallis et al., 2024).

For an economy with a large volume of merchandise trade such as Vietnam, maritime connectivity matters not only for the amount of cargo that can be transported but also for access to international shipping services and port networks. The increase in the LSCI therefore captures a dimension that neither the LPI nor container throughput alone can fully represent.

This improvement is also consistent with Vietnam's expanding import and export activity. Nevertheless, stronger international connectivity does not imply that all components of the domestic logistics system operate at a corresponding level of efficiency. Connections between ports and roads, railways, inland waterways, logistics centers, and production areas remain important determinants of overall logistics-chain performance.

5.5. Implications for logistics development in Vietnam

The findings suggest several implications. First, logistics development should move beyond an emphasis on scale expansion toward simultaneous improvements in quality and efficiency. Continued growth in trade and cargo volumes creates demand for infrastructure investment, but logistics performance also depends on coordination among transport modes, trade procedures, and service quality.

Second, improving connections among seaports, logistics centers, industrial zones, and production areas can help Vietnam make better use of its growing international maritime connectivity. Investment in individual ports or transport modes may be insufficient when the links among components of the logistics system remain weak.

Third, logistics service quality should receive attention alongside investment in physical infrastructure. Wang et al. (2024) indicate that infrastructure quality, logistics competence, and customs efficiency can play important roles in trade. As Vietnam becomes more deeply integrated into international supply chains, technology, cargo tracking, data processing, and service reliability should be considered together with transport capacity.

Finally, monitoring logistics development in Vietnam should rely on a multidimensional indicator system rather than a single index. The LPI captures quality and efficiency but is not available annually; container throughput captures activity scale but does not directly measure quality; and the LSCI captures maritime connectivity but represents only one transport mode. Combining these indicators allows for a more comprehensive and cautious assessment of logistics development.

5.6. Contribution of the study

Compared with previous studies that primarily estimate the effects of the LPI on exports or imports, this study adds a long-term process-oriented perspective at the country level. Combining data on logistics performance, trade, container throughput, and maritime connectivity over 2010–2024 makes it possible to identify simultaneous changes in the scale, quality, and connectivity of Vietnam's logistics system.

The results show that Vietnam's logistics development cannot be described simply as a single upward trend. While trade, container throughput, and maritime connectivity expanded substantially, logistics performance measured by the LPI fluctuated across assessment rounds. This finding reinforces the need for a multidimensional approach to logistics assessment and provides a basis for further research on the determinants of logistics quality and efficiency in Vietnam.

6. CONCLUSION

This study examined logistics development in Vietnam during 2010–2024 using indicators of logistics performance, trade, and transport. The results show that Vietnam's logistics system developed substantially over more than a decade, alongside strong expansion in international trade and improved transport connectivity.

During the study period, total merchandise trade increased from approximately USD 157.08 billion in 2010 to USD 785.34 billion in 2024, corresponding to a CAGR of approximately 12.18% per year. Container port throughput increased from approximately 6.43 million TEUs to 20.78 million TEUs, with a CAGR of approximately 8.74% per year. Logistics performance, as measured by the LPI, also improved over the long term, from 2.96 in 2010 to 3.30 in the 2023 assessment, although the index fluctuated across assessment rounds. At the same time, Vietnam's international maritime connectivity improved markedly, as reflected in the increase in the LSCI.

These findings indicate that logistics development in Vietnam is reflected not only in the expansion of freight-transport activity but also in logistics performance and connectivity with international transport networks. However, the pace and direction of change were not uniform across indicators. Assessments of logistics development should therefore draw on multiple groups of indicators rather than a single measure.

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