

Solutions to Enhance the Competitiveness of Vietnam's National Fleet

Nguyen Thi Cam Huyen

University of Transport, Ho Chi Minh City, Vietnam

PhD Candidate at Thuongmai University, Vietnam

Email: camhuyen.nguyen@ut.edu.vn

Abstract— The rapid development of international trade has positioned the maritime transport industry as a crucial player in the transportation of goods and the promotion of trade between nations. For Vietnam, in particular, with its strategic geographical location and long coastline, building a strong national fleet not only enhances the country's transport capacity but also ensures economic security, reduces dependence on foreign fleets, and increases the nation's competitiveness in the global market. However, in the increasingly competitive global shipping market, improving the competitiveness of the national fleet poses a significant challenge, requiring in-depth and systematic research to propose appropriate solutions. Through this article, the author analyzes the current state of factors affecting the competitiveness of the national fleet, thereby proposing suitable solutions to enhance the competitiveness of Vietnam's maritime fleet in the near future.

Keywords— National fleet, competitiveness, influencing factors.

I. THEORETICAL BASIS

1.1. Definition of Competitiveness

Competitiveness is a multidimensional and complex concept, encompassing knowledge from various fields such as economics, management, history, politics, and culture, and is studied at multiple levels and perspectives. Competitiveness is synonymous with the economic strength of a country, industry, or individual enterprise (Srivastava et al., 2006). In an ever-changing economic landscape, the survival and success of a nation or organization increasingly depend on competitiveness. As the competitive environment becomes more intense, competitiveness becomes a decisive tool to confront and overcome challenges. Therefore, achieving competitive advantage has become a new goal for many countries today, as it is closely linked to prosperity and directly impacts a nation's economic potential (Bhawsar & Chattopadhyay, 2015).

According to the Collins dictionary, a fleet is "a group of ships working together" or under the coordination of an organization or nation. A maritime fleet may include cargo ships, cruise ships, fishing vessels, military ships, or various other types of ships used for specific purposes. Ships within a fleet often operate together to perform tasks such as transporting goods, safeguarding seas, participating in military activities, or carrying out other operations at sea. Coordination among ships within a fleet is often done to ensure efficiency and safety during operations.

The national fleet is the entirety of vessels flying the flag of a specific nation. For example, Vietnam's marine fleet includes all ships registered under the flag of Vietnam. As previously defined, in this study, the national fleet refers to the group of vessels owned, operated, and controlled by a nation to perform the transportation of goods by sea. The national fleet is a crucial part of a country's maritime transport industry, playing an indispensable role in serving the nation's economy and trade.

A national fleet consists of various types of ships with different sizes, types, and capacities to meet the demand for

transporting goods to and from that nation via the sea, as well as participating in international trade. Therefore, a large and high-quality national fleet can create a competitive advantage for that country in the global market, while contributing to national defense, creating employment opportunities, and supporting global economic growth.

1.2. Concept and Role of Competitiveness of the National Maritime Fleet

The competitiveness of a national maritime fleet refers to a country's ability to manage, operate, and develop its fleet in order to compete with the fleets of other nations on the international market. This is demonstrated by the country's ability to maintain and expand the size of its fleet, improve operational efficiency, comply with national and international regulations, and build and strengthen business relationships with various international partners.

The competitiveness of a national maritime fleet determines the success of that country in providing maritime transport services in the global market, reflected in aspects such as transportation speed, competitive pricing, assured quality, and the ability to attract customers internationally. To achieve this, it is crucial to ensure the fleet's operational efficiency, manage maritime assets, protect the environment, and proactively participate in international agreements related to maritime transport. Nations that enhance the competitiveness of their maritime fleets help shape international trade activities, promote economic development, and ensure national security at sea.

The competitiveness of the national maritime fleet plays a crucial role in various aspects. First, it helps promote domestic trade and contributes to international trade by providing high-quality and efficient maritime transport services. This allows the country to engage deeply in the global supply chain, boost import-export activities, and create significant opportunities for domestic enterprises to participate in international trade. As a result, numerous job opportunities arise in sectors such as maritime transport services, ship maintenance, and port

management, which contribute significantly to national economic growth. Furthermore, the competitiveness of the maritime fleet helps the country shape international trade models, foster cooperation with various nations worldwide, and advance its national interests on the global stage.

1.3. Factors Creating Advantages for Maritime Transport Enterprises

The ability to manage and operate maritime transport is a key factor in building competitiveness for a national maritime fleet. This capability includes various aspects that directly impact the fleet's ability to monitor operations, maintain vessels, and adapt to changing market conditions effectively and efficiently (D'agostini et al., 2019; Gena et al., 2020). Yeo et al. (2011) provide evidence that operational capacity plays a significant role in the competitiveness of Asian container ports. Effective fleet management and operation are core competencies that greatly influence a fleet's business performance. Good management and operation help reduce operational costs, optimize the use of equipment and facilities, maximize the transport capacity of the fleet, thereby increasing revenue and profits, strengthening the company's resources, and enhancing the competitive advantage of the national fleet. Moreover, well-managed fleet operations ensure smooth and efficient service delivery, enhance transport service quality, build the reputation and brand of the national fleet, and consequently, strengthen its international competitiveness (Gena et al., 2020).

The quality of human resources, particularly skilled and dedicated crew members, forms the foundation for the competitiveness of a national maritime fleet. The quality and capacity of the workforce play a crucial role in determining the fleet's ability, competitiveness, and success in the maritime industry (Hetherington et al., 2006).

Operational costs also significantly contribute to building the competitiveness of a national fleet by providing services at reasonable prices, optimizing resources, and enhancing resilience to economic fluctuations. Specifically, lower operational costs help maritime transport enterprises reduce overall service costs and sea freight rates, thereby attracting more customers. In the fiercely competitive international market, the ability to offer maritime transport services at competitive prices is a significant advantage, allowing companies to secure key transport contracts and maintain long-term relationships with customers.

The capacity for alliances and partnerships in maritime transport services helps leverage the strengths and expertise of various members to create collective strength and build a shared competitive advantage for the alliance. This not only optimizes costs but also facilitates brand building and market expansion, thus increasing operational capacity, effectively utilizing the transport potential of the maritime fleet, and improving the business performance of the entire alliance (Chen et al., 2022).

II. FACTORS AFFECTING THE COMPETITIVENESS OF THE NATIONAL MARITIME FLEET

2.1. Demand Condition Factors in the Maritime Transport Services Market

Domestic maritime traffic and national transport demand: The domestic demand for maritime transport, essentially the country's import and export needs, plays a crucial role in enhancing the competitiveness of the national maritime fleet. The larger the national demand for goods transport, the higher the profits for the maritime fleet, which contributes to improving business efficiency, accumulating resources, and gaining experience. This helps the national maritime fleet (NMF) enhance its position, reputation, and core capabilities, ultimately increasing its competitiveness in the international maritime transport market. Additionally, fluctuations in national maritime transport demand provide the fleet with a clearer understanding of changes and evolving customer needs. This not only creates pressure but also serves as motivation for the fleet to innovate, improve service quality, and enhance its transport capacity and vessel tonnage, thereby strengthening competitiveness and meeting customer expectations.

International traffic and re-export demand: International maritime transport demand significantly impacts the competitiveness of the NMF. Compared to domestic maritime transport, international shipping orders are generally of higher value, yielding greater revenue for the maritime fleet. This has a profound effect on the fleet's profitability and business performance, allowing it to accumulate more resources for reinvestment in technical improvements and competitiveness.

Demand for multimodal transport and supply chain integration: Multimodal transport involves moving goods using a combination of different transportation modes such as road, sea, rail, and air. This combination helps reduce shipping costs and time by leveraging the strengths of each shipping method. Multimodal transport and supply chain integration are global economic trends, presenting vast market opportunities and attractive business prospects for the transport sector, including the maritime fleet. However, this demand also requires the NMF to enhance its ability to collaborate with other transport sectors and stakeholders. Additionally, the fleet must improve its management and operational capabilities to ensure smooth, efficient coordination between all involved parties during the transport process. This improved collaboration directly contributes to increasing the competitiveness of the NMF.

2.2. Input Production Condition Factors

Natural conditions: Natural factors, such as geographical location, river systems, and coastline length, play a crucial role in the formation and development of maritime transport routes. Favorable natural conditions give a maritime fleet an advantage in expanding transport routes, developing port systems, and combining with inland waterways to shorten transportation distances and reduce delivery times. This optimization of routes leads to cost savings and ensures timely deliveries, thereby enhancing the quality of transport services and creating a competitive edge for the fleet.

Infrastructure: Infrastructure includes roads, docks, airports, ports, telecommunications systems, electrical grids, and water supplies that facilitate the flow of goods from production sites to consumers. Specifically, port infrastructure—such as warehouses, loading and unloading yards, docking stations, and port communication systems—plays a significant role in the

competitiveness of port and maritime transport services (Yeo et al., 2011; Yuen & Thai, 2015). Well-developed infrastructure ensures efficient logistics and reduces bottlenecks in supply chains, contributing to the overall competitiveness of a national maritime fleet.

Shipbuilding industry quality: The shipbuilding industry provides the transport capacity, which is fundamental to the competitiveness of the national maritime fleet (NMF). The quality of the shipbuilding industry significantly impacts the competitiveness of the NMF. Specifically, the quality of the industry determines the ship's tonnage, type, and technology, which, in turn, affect the fleet's capacity, transport speed, operational efficiency, and even operating costs (Cao & Zhang, 2017). A high-quality shipbuilding industry, with advanced technical expertise, skilled labor, and modern equipment, produces ships with large tonnages, modern technology, and efficient operation. This improves the fleet's transport capacity and ability to handle large orders. Ship tonnage and transport capacity are key factors in determining the NMF's competitiveness in the international market. Additionally, modern technology, especially engines and machinery, enables the fleet to increase speed, reduce transport times, and improve overall service quality.

Access to fuel suppliers: Fuel suppliers provide the necessary fuel for the maritime fleet's operations, and fuel costs account for a significant portion of the fleet's annual operating expenses. Therefore, fuel prices from suppliers have a direct impact on input costs and therefore on the competitiveness of NMF. Research has shown that costs are one of the major competitive factors in international maritime transport. Beyond cost, fuel suppliers can also influence the fleet's transport schedules through the time required for refueling at ports, impacting overall efficiency and service quality.

2.3. Related and Supporting Industries

Related and supporting industries provide both inputs and outputs for the operations of the national maritime fleet (NMF), contributing to the value chain of maritime transport services and enhancing the NMF's competitiveness. These industries include port services, maritime services, and logistics services (Cao & Zhang, 2017). The interaction and collaboration among these sectors create synergies that increase the value of maritime transport services, thereby establishing competitive advantages for the NMF. Furthermore, strong relationships between the fleet and supporting industries ensure sustainable competitive advantages. Without the participation of these industries, the fleet would be heavily dependent on external suppliers, facing higher risks and losing the ability to innovate and improve productivity and service quality—key factors that significantly influence the NMF's competitiveness. The following supporting industries directly impact the competitiveness of the maritime fleet:

Quality of port services: Ports and maritime service equipment form the backbone of maritime operations and are essential for maintaining a competitive edge in the global shipping industry. Modern ports go beyond traditional docking functions, acting as comprehensive service providers that facilitate vessel arrivals, manage berthing, and offer critical maintenance and

repair services for both ships and their cargo (Baştuğ et al., 2022). The quality of port services is reflected in the port's capacity to handle ships (types, sizes, and the number of vessels that can be docked), cargo handling capacity (throughput, quality, and speed of loading/unloading), and port fees. These factors directly influence the competitiveness of the NMF through reduced costs, shorter transport times, faster cargo handling, and more reliable schedules. In particular, a port's ability to accommodate various types of ships and efficiently handle cargo has a significant impact on the national fleet's competitiveness (Gordon et al., 2005).

Quality of maritime services: High-quality maritime services are essential for improving the NMF's competitiveness by ensuring safe and efficient cargo transport. Regular maintenance, strict technical inspections, and adherence to international safety regulations minimize risks of accidents, cargo damage, and transport delays. Such safety and reliability enhance customer trust, helping maritime companies maintain a strong reputation and competitive position in the global market.

Quality of inland road transport: Inland road transport is closely linked with maritime transport, facilitating the distribution of goods from suppliers to ports and from ports to receivers. This is a crucial component that adds value to the NMF's transport services. Value-added services are a key determinant of international competitiveness for the NMF, as they create seamless logistics solutions that meet customer expectations.

Quality of warehouse logistics: In the maritime transport value chain, warehousing services are responsible for the storage and preservation of goods at departure and arrival points. Similar to inland road transport, warehousing adds value to the NMF's transport services, thus significantly influencing its competitiveness on the international stage. Specifically, high-quality warehousing ensures modern storage facilities equipped to maintain the quality and integrity of goods during transit. This is especially important for sensitive goods, such as perishable products with short shelf lives that require specialized handling and storage (Mehrzadegan et al., 2022).

2.4. Economic and International Development Opportunities

Economic openness: Measured by the ratio of total foreign trade value (including exports and imports) to the national GDP, economic openness affects market size, the vibrancy of international trade activities, and the level of global integration. A higher level of openness leads to an increase in international maritime transport demand, contributing to the growth of the national maritime fleet (NMF).

Domestic economic environment: A stable and growing domestic economy positively impacts societal consumption demand, which in turn stimulates production and business activities. This increases demand for maritime transport (both domestic and international) across a variety of goods, from raw materials and machinery to consumer products (Vukić & Cerbán, 2022).

International economic environment: A stable global economy creates favorable conditions for national economic development and fosters international integration, such as

participation in global value chains, expansion of export-import activities, and international market growth. As global economic activities thrive, the demand for international transport, including maritime transport, increases, presenting both opportunities and challenges for the NMF.

International trade cooperation: International trade directly influences maritime transport demand. As export-import activities expand, the need for international transport services grows, increasing the demand for maritime shipping. Conversely, a decline in international trade leads to reduced transport demand, affecting the profitability of the NMF. Economic integration and globalization have driven the proliferation of Free Trade Agreements (FTAs), which promote international trade, thereby boosting the demand for maritime transport and creating new business opportunities for the NMF.

2.5. State Management Factors for Maritime Transport

The factors influencing maritime transport, as discussed above, are subject to state management through the implementation of legal frameworks, policies, and institutional regulations. These actions either foster or hinder the development of maritime transport, indirectly affecting the competitiveness of the NMF. Additionally, the state directly impacts the NMF's competitiveness by creating the operational and competitive environment for the maritime industry. Effective governance establishes a free and fair legal environment for all businesses, encouraging healthy competition among enterprises, and fostering sustainable competitive advantages for the NMF. Conversely, weak governance results in market imbalances, reducing competitiveness and hindering the sustainable development of both the fleet and the maritime transport industry (Bilbao-Ubillos et al., 2021).

Maritime policy framework: National legal regulations guide and control the business activities of the maritime transport industry. Researchers have shown that governmental policies significantly influence the competitiveness of the shipbuilding industry and port services. For instance, government subsidies are a critical factor in determining the international competitiveness of the NMF.

Investment and business environment in maritime transport: Factors such as industry planning, legal regulations on business operations, transportation laws, administrative procedures, and legal frameworks on ownership and business contracts shape market entry barriers and the level of domestic market competition. A challenging business environment restricts the NMF's growth, thereby diminishing its competitive strength. On the other hand, a favorable business environment, with lower risks and reduced operating costs, enables the NMF to enhance its internal capacity, optimize operational efficiency, and compete internationally (Ng & Gujar, 2009).

Foreign policy and international relations: A nation's foreign policy and international relations determine its role and standing within the global community. Strong diplomatic relationships and favorable trade agreements can enhance the NMF's access to international markets and reduce trade barriers, supporting the fleet's expansion and global competitiveness. Conversely, strained international relations

may limit market access and increase the risks and costs associated with maritime transport operations.

III. ASSESSMENT OF THE CURRENT COMPETITIVENESS OF VIETNAM'S SHIPPING FLEET

3.1. Current Status of the Quality of Vietnam's Shipping Fleet

3.1.1. Average Age of Ships

The age of a ship is an important basis for assessing its level of wear and tear, which helps to control and ensure safety in maritime transport operations. This, in turn, contributes to evaluating the current status, quality, and competitiveness of the maritime transport sector. According to Decree 171/2016/ND-CP, the age of a ship is calculated in years and starts from the date of keel laying or the date the ship's hull is assembled, depending on the specific case. According to statistics from the Vietnam Maritime Administration, the average age of Vietnam's shipping fleet in 2023 is approximately 19 years. Specifically, the average age of a container fleet is 19 years, compared to the world average of 11 years, because Vietnam's container fleet is relatively old. The average age of the bulk carrier fleet is about 16 years; due to this relatively high age, these ships often face higher maintenance and repair costs and are more prone to technical failures. The average age of the oil tanker fleet is around 21 years, which is also quite high.

TABLE 1: Average Age of Vietnam's Shipping Fleet and Other Countries, 2018 - 2023 (unit: years)

Area	Type of vessel	2018	2019	2020	2021	2022	2023
Vietnam	Average Age of the Entire Fleet	15	16	17	17	18	19
	Oil tanker	18	18	19	19	20	21
	Bulk carrier	15	15	16	16	16	16
	General cargo	15	16	17	18	19	20
	Container ship	14	16	16	17	18	19
	Other ship	17	17	17	17	18	18
China	Average Age of the Entire Fleet	13	14	14	14	14	14
Japan	Average Age of the Entire Fleet	20	20	20	19	19	20
Korea	Average Age of the Entire Fleet	25	25	24	25	25	26
Singapore	Average Age of the Entire Fleet	9	10	10	11	11	12
Thailand	Average Age of the Entire Fleet	28	28	29	29	30	31
Malaysia	Average Age of the Entire Fleet	17	17	18	18	19	20
Indonesia	Average Age of the Entire Fleet	18	19	19	19	19	20
Philippin	Average Age of the Entire Fleet	31	31	31	31	32	33
ASEAN	Average Age of the Entire Fleet	18	18	19	20	20	21
Developing Countries	Average Age of the Entire Fleet	18	19	19	19	20	20
World	Average Age of the Entire Fleet	20	21	21	21	22	22

Source: UNCTADstat

In recent years, the average age of Vietnam's fleet has experienced some fluctuations but has not been positive. In 2018, the average age of Vietnam's fleet was about 15 years.

The Vietnamese shipping industry is still facing many challenges in investing in new ships, high shipbuilding costs, and a lack of strong financial support policies from the government. The COVID-19 pandemic has severely impacted the socio-economic situation in general and the shipping industry in particular, exacerbating the difficulties faced by shipping companies. Many shipping companies were unable to raise capital, leading to delays or cancellations of new ship investment projects. In 2021, the average age of the fleet continued to remain at 17 years.

Although the economy began to recover after the COVID-19 pandemic, the shipping industry in Vietnam still faces many challenges, such as difficulties for businesses in accessing investment capital and rising shipbuilding costs, which have slowed down the process of rejuvenating the fleet. The average age of the fleet in 2022 and 2023 continued to rise to 18 years and 19 years, respectively. The government's support policies for the shipping industry have started to be effective but are not sufficient to create a significant change in the average age of the fleet. The government needs to continue to enhance support policies such as tax incentives, financial assistance, and encouragement for investment in modern technology; shipping companies need to implement robust long-term strategies to improve the situation.

3.1.2. Ship Technology

Compared to the rapid development of automobile and aircraft technology, the development speed of maritime technology in general is still lagging. In particular, the technology of Vietnam's fleet is currently facing many technological challenges. Many ships still utilize outdated technology, resulting in low utilization efficiency and high maintenance and operational costs.

According to statistics from the Ministry of Transport, as of 2023, about 70% of Vietnam's ships older than 15 years were built from 1990 or early 2000. Most of these vessels still use old technology, lacking modern automation systems, advanced maritime safety standards, and green, fuel-efficient technologies.

The continued use of old engines and machinery systems on many ships will affect the business efficiency of shipping companies, maritime safety, the marine environment, and reduce the competitiveness of the national fleet. If the ship's transport management, navigation, and communication systems do not meet modern standards and lack automation and effective information connectivity, it will lead to increased operational costs, reduced profits for shipping companies, and decreased competitiveness compared to modern vessels from other countries in the region.

3.1.3. Cargo Handling Equipment

The cargo handling equipment on ships primarily consists of crane systems, lifting equipment, conveyors, and container loading and unloading systems. According to statistics from the Ministry of Transport, the majority of cargo handling equipment on Vietnamese vessels has not been significantly upgraded in recent years.

As reported by the Ministry of Transport, about 70% of Vietnam's container cargo ships still use traditional mechanical cranes, while approximately 30% utilize semi-automated or

fully automated cranes. Consequently, loading and unloading goods on these vessels often takes longer, is prone to safety issues, and reduces work efficiency.

The application of information technology in managing and tracking cargo on Vietnamese ships has not received sufficient attention. Many vessels still rely on manual management methods, which can lead to errors and inaccuracies in tracking the location and condition of goods. However, some shipping companies have begun implementing cargo management systems using RFID and GPS technology.

RFID (Radio Frequency Identification) is an upgraded version of barcode technology. This system reads identification codes using radio waves, making the monitoring of cargo and knowing the time of shipment and destination simpler, faster, and more accurate. This technology is ideal for accurately controlling and storing warehouses. The chips can also contain indicators for better information storage and utilize GPS positioning for tracking. However, the number of ships using RFID and GPS technology remains very low, accounting for about 20% of the total number of maritime transport vessels.

3.1.4. Communication Information Systems

The communication information systems of the maritime fleet must meet the requirements specified in the National Technical Regulation on Maritime Safety Equipment. However, the modernity and completeness of the communication information systems equipped on vessels vary. According to statistics from the Ministry of Transport in 2023, approximately 60% of Vietnam's maritime fleet has been equipped with advanced communication devices such as Global Positioning Systems (GPS), satellite communication devices, and Automatic Identification Systems (AIS) for tracking and communication.

3.2. Current Situation of the Transport Capacity of Vietnam's Maritime Fleet

3.2.1. Number of Ships

According to statistics from the Vietnam Maritime Administration, the total number of vessels in Vietnam's maritime fleet has decreased from 2018 to 2023. The total number of vessels in 2018 was 1,147, but by 2023, it had dropped to 976, a decrease of nearly 15%. Specifically: the number of oil tankers increased from 152 to 175, an increase of 15%; the number of bulk carriers decreased from 99 to 61, a reduction of 38%; the number of general cargo ships decreased from 785 to 618, a reduction of 21%; the number of container ships saw minimal change, rising from 41 to 43, an increase of nearly 5%, and the number of other types of ships also experienced a slight increase of nearly 13%.

General cargo ships, also known as multipurpose ships, are one of the specialized types of cargo ships used to transport various types of general cargo packed in containers (boxes, bags, etc.) or arranged separately in a fixed position (machinery, industrial equipment, metal sheets, etc.). This type of vessel can transport a diverse range of goods and currently represents the main type of ship in the Vietnamese fleet, accounting for about 63% of the total number of ships as of 2023.

TABLE 2: Number of Vietnamese Ships and Ships from Other Countries from 2018 to 2023
(Unit: Vessels)

Area	Type of vessel	2018	2019	2020	2021	2022	2023
Vietnam	Total Number of Ships	1.14	1.04	1.04	1.03	1.00	976
	Oil tanker	152	156	159	162	178	175
	Bulk carrier	99	99	101	87	73	61
	General cargo	785	669	667	660	636	618
	Container ship	41	39	38	38	43	43
	Other ship	70	84	84	85	79	79
China	Total Number of Ships	5.83	6.28	6.70	7.46	8.79	9.22
Japan	Total Number of Ships	4.99	5.09	5.47	5.13	5.19	5.23
Korea	Total Number of Ships	1.87	1.88	2.01	2.12	2.16	2.16
Singapore	Total Number of Ships	3.45	3.37	3.38	3.30	3.22	3.19
Thailand	Total Number of Ships	828	845	853	885	869	880
Malaysia	Total Number of Ships	1.73	1.74	1.80	1.78	1.76	1.75
Indonesia	Total Number of Ships	9.73	10.0	10.5	10.9	11.5	11.8
Philippines	Total Number of Ships	1.69	1.77	1.86	2.21	2.21	2.02
ASEAN	Total Number of Ships	19.7	20.1	20.8	21.5	21.9	22.2

Source: UNCTADstat & Vietnam Maritime Administration

TABLE 3: Load Capacity of the Vietnamese Maritime Fleet and Other Countries from 2018 to 2023
(Unit: 1,000 DWT)

Area	Type of vessel	2018	2019	2020	2021	2022	2023
Vietnam	Total Number of Ships	7.10	7.76	7.23	12.0	12.3	12.4
	Oil tanker	1.50	1.53	1.69	2.21	3.99	3.85
	Bulk carrier	2.20	2.41	2.82	3.38	3.32	3.43
	General cargo	2.93	2.91	2.92	2.91	2.88	2.85
	Container ship	414	415	423	457	482	546
	Other ship	43	479	-630	3.03	1.66	1.73
China	Total Number of Ships	90.6	99.0	103.	110.	120.	127.
Japan	Total Number of Ships	37.7	39.2	40.7	39.0	40.0	41.7
Korea	Total Number of Ships	13.9	13.0	14.9	15.7	15.7	18.9
Singapore	Total Number of Ships	128.	129.	139.	136.	131.	135.
Thailand	Total Number of Ships	6.28	5.80	6.70	6.07	5.38	4.69
Malaysia	Total Number of Ships	10.2	10.4	10.4	10.2	9.22	9.46
Indonesia	Total Number of Ships	23.7	25.4	27.2	29.1	29.4	30.2
Philippines	Total Number of Ships	5.94	5.66	6.62	6.57	6.49	6.04
ASEAN	Total Number of Ships	183.	186.	201.	199.	195.	198.

Source: UNCTADstat & Vietnam Maritime Administration

3.2.2. Load Capacity of the Vietnamese Fleet

According to reports from the Vietnam Maritime Administration, the number of vessels in the Vietnamese fleet is declining, but their load capacity is increasing. From 2018 to 2023, the total load capacity of the Vietnamese fleet rose from 7,101,000 DWT (Deadweight Tonnage) to 12,422,000 DWT, an increase of nearly 75%. This increase reflects a positive trend in the modernization and upgrading of the Vietnamese fleet. In 2023, while the number of general cargo ships accounted for about 63%, their total load capacity represented only about 23%. In contrast, while bulk carriers made up only 6.25% of the total number of ships in the national fleet, their total load capacity accounted for as much as 27.7% of the entire fleet's load capacity. This indicates a significant difference in load capacity among various types of ships within the Vietnamese fleet. Additionally, the total load capacity of different types of ships has experienced significant fluctuations over the years.

The total load capacity of oil tankers has increased from 1,502,000 DWT in 2018 to 3,854,000 DWT in 2023, representing an increase of nearly 157%. This shows a growing demand for the transportation of oil and petroleum products, prompting oil transport companies to intensify their investments in new vessels and upgrades to increase their ships' load capacity.

3.3. Current Status of the Quality of Maritime Transport in the Vietnamese Fleet

In recent years, the quality of maritime transport services in the Vietnamese fleet has seen significant improvements. According to statistics from the Vietnam Maritime Administration, the quality of transport in the Vietnamese fleet from 2018 to 2023 is specifically reflected as follows:

The average delivery time from port to domestic port has decreased from 16 days to 14 days, with on-time delivery rates reaching about 85%. The adherence to the delivery schedule has improved from 80% to 85%, due to the application of advanced ship management technologies such as integrated maritime management systems and real-time tracking software. However, there are still many incidents causing port congestion, bad weather conditions, and technical failures. These incidents result in approximately 10% of shipments being delayed by more than 24 hours. This indicates the need for improvements in port infrastructure and weather forecasting technologies to minimize unexpected incidents.

The rate of cargo loss and damage during delivery has decreased from 2% to 1.5% over the past five years. This reduction is mainly due to the application of new technologies in the preservation and handling of goods. Maritime transport companies have invested in automated loading equipment and GPS-based cargo monitoring systems, helping to minimize the risk of damage. The rate of spoilage for perishable goods during long-distance transport has decreased from 3% to 2.2%, but further improvements are still needed in the preservation of goods and transportation conditions.

From 2018 to 2023, the on-time delivery rate has increased from 82% to 88%. This reflects improvements in ship management and maintenance, as well as the application of modern monitoring technologies. The rate of incidents related to accidents or security issues has decreased from 0.5% to 0.3%.

Strict safety measures, including periodic ship inspection procedures and safety training for crew members, have contributed to reducing incidents throughout the cargo transport process.

The continuity and regularity of maritime transport services have improved from 97% to 98% over the past five years. This increase is mainly due to enhanced ship maintenance, technological upgrades, and management technologies. The number of canceled voyages has decreased from 3% to 2%, attributed to issues related to ship conditions, unexpected technical failures, lack of synchronization in infrastructure, and other unforeseen incidents. Many maritime transport companies have invested in improving cargo handling infrastructure and regular maintenance, enhancing the quality and reliability of maritime transport services.

3.4. Current Status of Maritime Freight Rates in the Vietnamese Fleet

In recent years, maritime freight rates in the Vietnamese fleet have experienced significant fluctuations. According to statistics from the Vietnam Maritime Administration, pre-COVID-19 freight rates for major international routes such as East Asia and South Asia ranged from \$500 to \$600 per TEU (1 twenty-foot container). However, in the second half of 2020, freight rates sharply declined due to a decrease in global shipping demand and congestion in the supply chain. Maritime freight rates dropped to around \$400 to \$500 per TEU, partly due to a reduction in the volume of goods transported and partly due to lockdown measures in various countries that diminished shipping volumes.

Entering 2021, maritime freight rates began to show signs of recovery due to the rebound of the global economy and increased demand for maritime transport. However, the shipping industry continued to be affected by the COVID-19 pandemic, alongside port congestion and supply chain disruptions, which pushed freight rates higher. By mid-2021, maritime freight rates for international routes from Vietnamese ports increased to about \$600 to \$800 per TEU. This situation persisted until the end of 2022, when rates reached their highest levels in five years, due to a shortage of ships and containers, as well as rising fuel prices.

Maritime freight rates began to stabilize more in 2023, but they remained high compared to the pre-pandemic period due to global economic growth, increasing demand for maritime transport, and high operating costs. According to information from maritime organizations and market reports, the current freight rates for the Vietnamese fleet range from \$550 to \$750 per TEU, which is relatively high but somewhat more stable than the peaks seen in 2021.

4.1. Achievements

Firstly, the total deadweight tonnage (DWT) of the fleet has continually improved: From 2018 to 2023, the total deadweight tonnage of the Vietnamese maritime fleet increased from 7,101,000 DWT to 12,422,000 DWT, an increase of nearly 75%. This growth reflects a positive trend in the modernization and upgrading of the Vietnamese maritime fleet, as well as the attention of shipping companies and the government to

upgrading the fleet. This will contribute to enhancing the competitiveness of the fleet on maritime transport routes.

Secondly, modernization of the fleet: Vietnam has made significant investments in modernizing the fleet, with many shipping companies adding new ships equipped with advanced technology and meeting international standards. In the period from 2018 to 2023, approximately 40 new ships were put into service, including large container ships and oil tankers.

Thirdly, expanding the market for the Vietnamese maritime fleet: Active participation in new generation free trade agreements will increase the scale of maritime transport service markets. As export and import activities between Vietnam and its trading partners grow, the logistics service market will expand, particularly in maritime transport.

Fourthly, improved service quality: The Vietnamese maritime fleet has focused on enhancing service quality through the application of international standards and new technologies in the management and operation of the system. The implementation of modern voyage monitoring and transport management systems has significantly improved the quality of maritime transport services, reduced risks, and enhanced the ability to meet increasingly diverse customer needs. This has contributed to raising the prestige, reliability, and competitiveness of the Vietnamese maritime fleet.

Fifthly, improved management efficiency: The adoption of advanced management systems and information technology has helped the Vietnamese maritime fleet enhance its management and operational efficiency. These systems assist in monitoring and analyzing operational data, thereby optimizing transport processes, cargo handling, and minimizing costs. Additionally, investing in human resource training has also been a focus, aiming to meet the increasing demand for service quality and operational efficiency.

4.2. Limitations

Firstly, the fleet size is still limited and shows a decreasing trend: The total number of ships in the Vietnamese maritime fleet has been declining from 2018 to 2023. The total number of ships in 2018 was 1,147, but by 2023 it had decreased to only 976, a reduction of nearly 15%.

Secondly, there is a lack of high-quality specialized ships: The Vietnamese maritime fleet mainly consists of general cargo ships, oil tankers, bulk carriers, and medium and small-sized container ships; other types of ships account for a very low proportion, particularly a shortage of high-quality specialized ships.

Thirdly, the supporting infrastructure for maritime transport is still weak: In recent years, the infrastructure supporting maritime transport, such as port systems and maintenance facilities, has gradually improved, but it still has limitations in scale and quality.

Fourthly, the average age of the Vietnamese maritime fleet is quite high, and equipment is relatively outdated: The average age of the fleet is 19 years, having increased by 4 years since 2018. Although the government has made significant efforts in issuing policies and programs to support the maritime transport sector, the pace of modernizing the fleet has not progressed due to various financial challenges and investment costs.

Fifthly, the workforce with specialized skills and high qualifications is still limited: Currently, there is a severe shortage of crew members in the country, especially captains and chief engineers. Training an individual to become a captain or chief engineer after graduating from the Maritime University takes at least 10 more years. Although the salary is relatively high, the nature of the job, which often requires long periods away from home and exposure to danger, makes it difficult to attract skilled personnel.

Sixthly, high operating costs: The operating costs of the Vietnamese maritime fleet, including maintenance, fuel, and spare parts, remain high compared to some regional competitors like Singapore and Malaysia. High costs lead to increased freight rates, reduced profits, and decreased price competitiveness of the national fleet in international shipping contracts.

Seventhly, a lack of knowledge and experience in international maritime transport markets: The Vietnamese maritime fleet still lacks experience in managing and exploiting complex international shipping routes; there is also a lack of information and understanding of the legal regulations related to international maritime transport.

Eighthly, dependence on foreign suppliers: Vietnamese shipping companies still rely on foreign suppliers for raw materials, spare parts, and maintenance services. This reduces the autonomy and flexibility of the fleet, which may lead to risks regarding costs and service quality, affecting the competitiveness of the fleet in the international market.

4.3. Causes of Limitations

Firstly, the limited size of the fleet and its decreasing trend from 2018 to 2023 is due to a lack of long-term investment in shipbuilding and fleet development. Government support policies to encourage investment in shipbuilding are not strong or aggressive enough and lack attractive financial incentives for shipping companies. Raising capital from banks and financial institutions also faces many difficulties, slowing down the fleet expansion process for maritime transport enterprises. In addition, the COVID-19 pandemic is one of the significant factors affecting the development of the maritime transport sector in general and the size of the Vietnamese fleet in particular during 2020.

Secondly, the shortage of high-quality specialized ships, such as large oil tankers and large container ships, is mainly due to the lack of policies encouraging and supporting investment in specialized vessels. Most companies in the national maritime transport sector still prioritize investing in smaller ships due to lower initial costs, simpler operational processes, and fewer demands regarding skilled labor and shipbuilding technology.

Thirdly, the weak infrastructure is due to the port infrastructure development policy not being synchronized with fleet development, leading to infrastructure that does not meet the requirements of large and modern ships.

Fourthly, the relatively high average age of the fleet and the outdated equipment result from a lack of investment in research and development of new technologies. National shipping companies often encounter difficulties in updating new

technologies due to high costs and a lack of government support for investment and technological innovation.

Fifthly, the limited availability of skilled and highly qualified human resources is due to the lack of in-depth training programs and educational institutions that meet international standards; the training programs do not closely align with the practical requirements of the maritime transport profession; policies for educators are not attractive enough to draw skilled individuals into training; and there are many unreasonable training and apprenticeship processes, such as requiring university or college graduates to work as sailors for two years before being considered for officer training. The salary and working conditions are not attractive enough to retain talent in the industry; working on a ship is quite labor-intensive and arduous, often lacking emotional support and care for family, while the income of land-based workers is not significantly different from that of crew members.

Sixthly, high operating costs mainly stem from the prices of input materials, especially marine fuel, and maintenance costs. Dependence on the supply of raw materials, spare parts, and maintenance services from abroad leads to high operating costs. Tax policies and environmental protection regulations also contribute to increasing operational costs for shipping companies.

5. Proposed Policy Solutions to Enhance the Competitiveness of the Vietnamese Maritime Fleet

From the analyzed current situation, aimed at enhancing the competitiveness of the Vietnamese maritime fleet in the near future, the author proposes several policy solutions as follows:

Firstly, a solution for restructuring, innovating, and improving the quality of the national maritime fleet. The restructuring, innovation, and quality improvement of the maritime fleet should be strongly implemented, focusing on criteria such as deadweight tonnage, the number of ships, average age of the fleet, and the structure of specialized vessels.

Secondly, a solution to promote the application of new and modern technologies for the national maritime fleet in line with the modernization trends of fleets in the region and the world. Applying new technologies, modern techniques, and optimizations for the national maritime fleet is an inevitable trend in the context of the rapid development of the digital economy and the strong application of achievements from the Fourth Industrial Revolution. This solution will not only improve the performance and quality of the Vietnamese maritime fleet but also meet the trend of developing safe and secure maritime transport, reducing fuel consumption, decreasing carbon emissions, being environmentally friendly, and advancing the goal of "new technology for a greener maritime industry," thereby enhancing the competitiveness of the Vietnamese maritime fleet and promoting green growth and sustainable development. The application of new technologies should focus on: electromechanical technology and intelligent ship systems, fuel optimization and energy-saving systems, renewable energy (solar, wind), and liquefied natural gas (LNG) engines, upgrading the digital navigation management systems of vessels.

Thirdly, a solution to manage old and unlicensed ships strictly, facilitating maritime transport enterprises to purchase

new vessels. In addition to restructuring the fleet and promoting the application of modern technologies, strict management of old and unlicensed ships is one of the very important solutions to enhance the quality of maritime transport and the competitiveness of the Vietnamese maritime fleet.

Fourthly, a solution to increase the number, deadweight tonnage, and scale of vessels. This is an essential solution to increase maritime transport capacity, contributing to gradually improving the competitiveness of the Vietnamese maritime fleet in the context of the growing scale and improved quality of foreign maritime transport vessels. To implement the solution of increasing the number, deadweight tonnage, and scale of vessels, maritime transport enterprises need to increase investment in purchasing new ships; logistics companies should focus on investing in specialized vessels based on evaluating and forecasting the effectiveness of current transport demand and cargo volumes, as well as future development trends; prioritize using clean energy vessels; and authorities need to urgently develop and effectively implement strong incentives for the domestic shipbuilding industry and prioritize imported ships.

Fifthly, a solution to enhance the proactivity, flexibility, and specialization of the fleet to meet the diverse global cargo transport demands. This is one of the important solutions alongside increasing deadweight tonnage and vessel scale to respond to the robust development of international trade, the rapidly increasing demand for diverse import and export cargo transportation; expanding maritime transport market share, especially on long-haul maritime routes globally; reducing dependence on foreign vessels in import and export activities with various types of goods; and enhancing the operational efficiency and competitiveness of the Vietnamese maritime fleet.

Sixthly, a solution to expand markets, increase market share and accessibility. Besides improving transport capacity through increasing deadweight tonnage, scale of vessels, and enhancing proactivity, flexibility, and specialization, enterprises need to innovate business strategies such as expanding markets and increasing market share and accessibility in the context of fierce competition and the growing scale of international maritime transport fleets.

Seventh, a solution for a tightly implemented transport process and rapid delivery times. Ensuring a quick transport process and delivery times, adhering strictly to delivery schedules is one of the critical factors that not only helps save waiting time at ports but also increases customer trust and satisfaction regarding maritime transport services, improves transportation efficiency, enhances transport quality, and boosts the competitiveness of maritime transport enterprises.

Eighth, a solution to ensure maritime transport safety and security. Ensuring maritime transport safety is one of the very important criteria that customers particularly care about when selecting service providers. Recently, maritime transport has frequently faced adverse issues and risks related to sea freight, such as natural and weather-related risks, accidents, theft risks, piracy, cargo theft, and military conflicts; risks related to cyber security in the maritime industry and cyber attacks on vessels, such as network attacks disrupting services, system shutdowns,

interference with GPS signal reception leading to vessel collisions or directional changes, and radar interference on ships. Therefore, ensuring safety and security in maritime transport is vital, helping to enhance customer trust, reputation, and satisfaction; improving service quality and the competitiveness of the fleet. Maritime transport enterprises need to proactively develop preventive plans, ensure safety, and minimize transportation risks according to international maritime safety regulations while flexibly responding to complex and unpredictable situations.

Ninth, a solution to enhance the capacity of enterprise management and the operation of the transport fleet. This solution is a fundamental and critical factor in improving maritime transport quality and enhancing the competitiveness of the fleet. Alongside improving the level and skills of human resources, enterprises need to proactively establish and organize the implementation of pathways for solutions to enhance management and operational capacity, such as innovating, improving management methods, and operating the fleet; investing in funds and intensifying the application of information technology in management, operation, and fleet exploitation, such as Transportation Management Systems (TMS), tracking and tracing systems; and focusing on crew management onboard.

IV. CONCLUSION

Through assessing the current capabilities of the Vietnamese maritime fleet, it is evident that various factors significantly influence the competitiveness of the fleet. The author has pointed out both the successes and limitations concerning the competitiveness of the Vietnamese maritime fleet. From this, effective solutions that align with the development direction and socio-economic situation of Vietnam in the coming period are proposed.

REFERENCE

- [1]. Baştuğ, S., Haralambides, H., Esmer, S., & Eminoğlu, E. (2022). Port competitiveness: Do container terminal operators and liner shipping companies see eye to eye? *Marine Policy*, 135(October 2021). <https://doi.org/10.1016/j.marpol.2021.104866>
- [2]. Bhawsar, P., & Chattopadhyay, U. (2015). Competitiveness: Review, Reflections and Directions. *Global Business Review*, 16(4), 665–679. <https://doi.org/10.1177/0972150915581115>
- [3]. Bilbao-Ubillos, J., Fernández-Sainz, A., & Payán-Azkue, R. (2021). State aid, EU maritime transport policies and competitiveness of EU country fleets. *European Transport Research Review*, 13(1), 1–15. <https://doi.org/10.1186/s12544-020-00463-1>
- [4]. Cao, W., & Zhang, M. (2017). The Optimization and Scheduling Research of Shuttle Combined Vehicles in Automated Automatic Three-dimensional Warehouse. *Procedia Engineering*, 174, 579–587. <https://doi.org/10.1016/j.proeng.2017.01.190>
- [5]. Chen, J., Ye, J., Zhuang, C., Qin, Q., & Shu, Y. (2022). Liner shipping alliance management: Overview and future research directions. *Ocean and Coastal Management*, 219(January), 106039. <https://doi.org/10.1016/j.ocecoaman.2022.106039>
- [6]. D'agostini, E., Nam, H.-S., & Kang, S.-H. (2019). Gaining Competitive Advantage at Sea: An Overview of Shipping Lines' Strategic Decisions. *International Journal of Transportation Engineering and Technology*, 5(4), 74. <https://doi.org/10.11648/j.ijtet.20190504.12>
- [7]. Gena, B., Arief, D., Tridoyo, K., & Nimmi, Z. (2020). Competitive advantage improvement strategy of container shipping industry: Case of Indonesia. *International Journal of Shipping and Transport Logistics*, 12(4), 307–339. <https://doi.org/10.1504/IJSTL.2020.108403>

- [8]. Gordon, J. R. M., Lee, P. M., & Lucas, H. C. (2005). A resource-based view of competitive advantage at the Port of Singapore. *Journal of Strategic Information Systems*, 14(1), 69–86. <https://doi.org/10.1016/j.jsis.2004.10.001>
- [9]. Hetherington, C., Flin, R., & Mearns, K. (2006). Safety in shipping: The human element. *Journal of Safety Research*, 37(4), 401–411. <https://doi.org/10.1016/j.jsr.2006.04.007>
- [10]. Mehrzadegan, E., Ghandehari, M., & Ketabi, S. (2022). A joint dynamic inventory-slot allocation model for liner shipping using revenue management concepts. *Computers and Industrial Engineering*, 170(June), 108333. <https://doi.org/10.1016/j.cie.2022.108333>
- [11]. Ng, A. K. Y., & Gujar, G. C. (2009). Government policies, efficiency and competitiveness: The case of dry ports in India. *Transport Policy*, 16(5), 232–239. <https://doi.org/10.1016/j.tranpol.2009.08.001>
- [12]. Srivastava, D. K., Talha, M., & Shah, H. (2006). Determinants of competitiveness in indian public sector companies: An empirical study. *Competitiveness Review*, 16(3–4), 212–222. https://doi.org/10.1108/cr.2006.16.3_4.212
- [13]. Vukić, L., & Cerbán, M. del M. (2022). Economic and environmental competitiveness of container shipping on alternative maritime routes in the Asia-Europe trade flow. *Maritime Transport Research*, 3(May). <https://doi.org/10.1016/j.martra.2022.100070>
- [14]. Yeo, G. T., Roe, M., & Dinwoodie, J. (2011). Measuring the competitiveness of container ports: Logisticians' perspectives. *European Journal of Marketing*, 45(3), 455–470. <https://doi.org/10.1108/03090561111107276>
- [15]. Yuen, K. F., & Thai, V. Van. (2015). Service quality and customer satisfaction in liner shipping. *International Journal of Quality and Service Sciences*, 7(2/3), 170–183. <https://doi.org/10.1108/IJQSS-02-2015-0024>
- [16]. Ministry of Transport (2011), *Decision No. 1576/QĐ-BGTVT approving the development plan for human resources in the transport sector for the period 2011-2020*, Ministry of Transport of the Socialist Republic of Vietnam.
- [17]. Ministry of Transport (2022), *Decision No. 1254/QĐ-BGTVT on the approval of the project to develop the fleet of maritime transport vessels of Vietnam*, Ministry of Transport of the Socialist Republic of Vietnam.
- [18]. General Statistics Office (2024), *Vietnam Statistical Yearbook 2023*, Statistical Publishing House.
- [19]. Prime Minister (2021), *Decision No. 1579/QĐ-TTg approving the master plan for the development of Vietnam's seaport system for the period 2021-2030, with a vision to 2050*, Prime Minister of the Socialist Republic of Vietnam.
- [20]. Prime Minister (2022), *Decision No. 01/2022/QĐ-TTg issuing the list of sectors and facilities that must conduct greenhouse gas inventories*, Prime Minister of the Socialist Republic of Vietnam.
- [21]. Prime Minister (2022), *Decision No. 411/QĐ-TTg approving the national strategy for the development of the digital economy and digital society until 2025, with a vision to 2030*, Prime Minister of the Socialist Republic of Vietnam.