



School of Social Sciences  
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Postgraduate Dissertation

«Overcapacity in the Container Ship Maritime Industry:  
Causes, Impacts, and Implications for Shipping Companies.  
A Comparative Analysis of the 2M Alliance and the Ocean  
Alliance»

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Patras, Greece, June 2025

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Overcapacity in the Containership Maritime Industry:  
Causes, Impacts, and Implications for Shipping Companies.  
A Comparative Analysis of the 2M Alliance and the Ocean  
Alliance

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*This dissertation is dedicated to my family, with special gratitude to my three children—**George, Vaggelis, and Nicolas**—whose support was invaluable throughout this challenging time.*

*I am incredibly grateful for my professors' guidance and support throughout my postgraduate studies. Their insights throughout this Program were invaluable and shaped my understanding profoundly. I truly appreciate the time and effort they dedicated to helping me succeed in this long journey.*

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## **Abstract**

This thesis examines the ongoing issue of overcapacity in the container shipping industry. It presents research on how the overcapacity disturbs the balance of supply and demand in the containership market, creating economic, operational, and environmental complexities that affect global trade and hinder from sustainability efforts. The study starts with the evolution of the industry, emphasizing how globalization, fleet expansion, and the deployment of increasingly larger vessels have contributed to the deterioration of the problem of overcapacity. The main causes of overcapacity are critically analyzed, followed by an examination of its impacts, such as freight rate instability, underutilized assets, and elevated emissions.

To confront these challenges, the research consists various mitigation strategies, including industry consolidation, strategic alliances, and digital transformation. Special attention is given to the emergence and structure of major shipping alliances, particularly the 2M and Ocean Alliance, comparing their capacity distribution and market impact. The thesis uses both qualitative and quantitative methods, including PESTEL and SWOT analyses, to frame alliance behavior and strategic choices in a changing global trade environment.

The empirical findings highlight the importance of alliances in improving capacity use and stabilizing the market, though challenges persist. The concluding discussion offers insights into adopting new strategic responses and forecasts the future trends in managing overcapacity. This study improves the knowledge of structural inefficiencies in container shipping and proposes practical frameworks for sustainable growth in the sector.

## **Keywords**

Overcapacity, container shipping alliances, supply and demand imbalance, sustainability, KPIs, stylized facts

## Διερεύνηση των προκλήσεων από την πλεονάζουσα χωρητικότητα των container των πλοίων και οι επιπτώσεις για τις ναυτιλιακές εταιρείες

Παπαδοπούλου Σοφία

### Περίληψη

Η παρούσα εργασία εξετάζει το συνεχές πρόβλημα της πλεονάζουσας χωρητικότητας στη βιομηχανία της μεταφοράς εμπορευματοκιβωτίων. Η έρευνα παρουσιάζει πώς η πλεονάζουσα χωρητικότητα διαταράσσει την ισορροπία προσφοράς και ζήτησης στον τομέα της μεταφοράς εμπορευματοκιβωτίων, δημιουργώντας οικονομικές, λειτουργικές και περιβαλλοντικές προκλήσεις που επηρεάζουν το παγκόσμιο εμπόριο και παρεμποδίζουν την βιωσιμότητα. Η μελέτη ξεκινά με την εξέλιξη της βιομηχανίας, τονίζοντας πώς η παγκοσμιοποίηση, η επέκταση του στόλου των ναυτιλιακών γραμμών με μεγαλύτερα πλοία έχουν συμβάλει στην επιδείνωση του προβλήματος. Οι βασικές αιτίες καθώς και οι επιπτώσεις του προβλήματος αναλύονται σε βάθος, όπως η αστάθεια των ναύλων, η υποαπασχόληση των πλοίων και η αύξηση των εκπομπών ρύπων. Για την αντιμετώπιση αυτών των προκλήσεων, η έρευνα εξετάζει διάφορες στρατηγικές διαχείρισης, όπως η συγχώνευση των ναυτιλιακών γραμμών, οι στρατηγικές συμμαχίες αλλά και η συμβολή των νέων τεχνολογιών. Ιδιαίτερη έμφαση δίνεται στην εμφάνιση και τη δομή των μεγάλων ναυτιλιακών συμμαχιών, κυρίως στις 2M και Ocean Alliance, με σύγκριση ως προς τη διαχείριση χωρητικότητας και την επίδραση στην αγορά.

Η εργασία χρησιμοποιεί ποιοτικές και ποσοτικές μεθόδους, όπως η ανάλυση PESTEL και SWOT. Τα ευρήματα αναδεικνύουν τη σημασία των συμμαχιών στη βελτιστοποίηση της χρήσης της χωρητικότητας και στη σταθεροποίηση της αγοράς, αν και οι προκλήσεις παραμένουν. Τέλος, γίνεται αναφορά στην υιοθέτηση νέων στρατηγικών προσεγγίσεων και καταγράφονται μελλοντικές τάσεις στη διαχείριση της χωρητικότητας των ναυτιλιακών γραμμών. Η μελέτη συμβάλλει στην κατανόηση αναποτελεσματικών πρακτικών στη ναυτιλία μεταφοράς εμπορευματοκιβωτίων και προτείνει πρακτικές για πιο βιώσιμη ανάπτυξη του τομέα.

### Λέξεις – Κλειδιά

Πλεονάζουσα χωρητικότητα, ναυτιλιακές συμμαχίες, μη ισορροπία προσφοράς και ζήτησης, βιωσιμότητα, δείκτες απόδοσης (KPIs), τυποποιημένα δεδομένα (stylized facts)

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## List of Abbreviations & Acronyms

<b>AHP</b>	Analytic Hierarchy Process
<b>AI</b>	Artificial intelligence
<b>APL</b>	APL Shipping Company
<b>APM</b>	APM Terminals Company
<b>BIMCO</b>	The Baltic and International Maritime Council
<b>BSI</b>	Black Sea Initiative
<b>CKHY</b>	Alliance of Shipping Companies
<b>CM</b>	Containership Market
<b>CMA CGM</b>	CMA CGM Group of Shipping Companies
<b>CO<sub>2</sub></b>	Carbon dioxide
<b>CSSC</b>	Container shipping supply chain
<b>DIS</b>	Digital Information Sharing
<b>EDI</b>	Electronic Data Interchange
<b>ESG</b>	Environmental, Social, and Governance
<b>ETS</b>	Emissions Trading System
<b>EU</b>	European Union
<b>EV</b>	Electric vehicle
<b>GDP</b>	Gross Domestic Product
<b>GHG</b>	Greenhouse Gases
<b>GPS</b>	Global Positioning System
<b>HHI</b>	Herfindahl - Hirschman Index
<b>HMM</b>	Alliance of Shipping Companies
<b>HVO</b>	Hydrotreated vegetable oil
<b>IMO</b>	International Maritime Organization
<b>KPIs</b>	Key Performance Indicators
<b>LNG</b>	Liquefied natural gas
<b>MSC</b>	MSC Global Container Shipping Company
<b>Mt</b>	Metric ton
<b>n.d.</b>	No date
<b>OECD</b>	Organization for Economic Co-operation and Development
<b>OOCL</b>	Alliance of Shipping Companies
<b>PESTEL</b>	Political, Economic, Social, Technological, Environmental, and Legal
<b>PMI</b>	Purchasing Managers' Index
<b>PSC</b>	Port State Control
<b>SAF</b>	Sustainable aviation fuel
<b>SCA</b>	Slot charter agreements
<b>SCFI</b>	Shanghai Containerized Freight Index
<b>SWOT</b>	Strengths, weaknesses, opportunities, and threats
<b>TEU</b>	Twenty Equivalent Unit
<b>TEUs</b>	Twenty-foot Equivalent Unit

<b>TIL</b>	Terminal Investment Limited
<b>UNCTAD</b>	UN Trade and Development
<b>VSA</b>	Vessel sharing agreements
<b>VSAS</b>	Alliance sharing agreement
<b>VSAs</b>	Vessel Sharing Agreements
<b>YML</b>	Alliance of Shipping Companies
<b>ZIM</b>	Alliance of Shipping Companies

# 1. Overcapacity in the Container Ship Maritime Industry.

## 1.1 Introduction

**Container transportation** is considered the main part of the global supply chain trade, since a single container can travel in many ways like boats, trains, and trucks, and can be moved by different equipment such as terminals, cranes trailers, and depots. The importance of the container shipping industry is noticeable with more than 70% of world trade being moved by container ships (Song, 2021). The container shipping supply chain involves a wide range of key players like shippers, freight forwarders, shipping lines, port-terminal workers, inland carriers, and intermodal terminal depot operators.

In the last decade, the global seaborne trade has experienced significant growth driven by the global economic upwind of 2017. However, the shipping industry faced a sudden contraction after the burst of the COVID-19 pandemic at the beginning of 2021. According to the Maritime Transport Review of 2024, the shipping liner market started to recover in January 2023 because the return to normalcy allowed global trade to flourish again after many disruptions in the supply chain (Trade U.N, 2024). Prospects for container ship trade are positive as increased volumes and a steady average annual growth rate through 2029 are projected.

During the pandemic, shipping companies made significant changes to their fleets and their schedules to confront disruptions as global trade trends reshaped. Shipping companies had to adjust to the new surge in demand for goods transportation that followed. However, as the market began to slow down, companies had to evaluate their fleets' condition. Overcapacity, the emergence of new shipping technologies, and fleet deployment strategies led to adjustments in supply. This caused an imbalance of supply and demand—where the number of ships available surpassed the demand for cargo space—further contributed to falling freight rates.

In the container shipping company, **overcapacity is defined** by the availability of a fleet supply that is greater than the transportation demand. Overcapacity in the shipping industry usually happens when international trade slows down and there is too much supply from shipping companies (Qi, 2013). This problem is made worse by high fixed costs and a lack of cooperation between companies (Heakel & Khedr, 2010). After the

2008 financial crisis, shipping companies focused on increasing ship size to reduce fixed costs and take advantage of economies of scale. While larger ships help reduce costs, they also create problems with port infrastructure and contribute to overcapacity in the market (Lister, 2015).

To address overcapacity, various strategies have been suggested. One such strategy, slow steaming, was originally seen as an environmental way to reduce emissions. However, it was also a response to market conditions like low freight rates and high fuel costs (Finnsigard et al., 2020). Slow steaming reduces fuel costs and increases route efficiency, but it also means more ships are needed for reliable service (Cheaitou & Cariou, 2012). Shipping companies have also used other strategies like blank sailing, forming strategic partnerships, raising rates, and increasing travel time to help manage overcapacity.

This thesis presents research on the deep impacts of overcapacity that disturbs the balance of supply and demand in the containership market, creating economic, operational, and environmental complexities that affect global trade and move away from sustainability goals.

## **1.2 Literature Review**

Past analyses prove that the maritime industry has experienced overcapacity issues with multiple effects in the marine economy. **Böhme** (1982) was the first to analyze the overcapacity situation and propose various solutions. Over the years, many researchers, including **Peters** (1993), have studied the reasons and effects of overcapacity in shipping and its impact on the industry's overall performance. The 2008 financial crisis created global economic difficulties that contracted world trade and decreased container shipping transportation demand. **Cariou** (2008) deeply investigated the impact of overcapacity on the liner shipping market. This problem has consistently appeared in the industry, often tied to market dynamics. **Garcia-Alonso** (2020) demonstrated how weather conditions impact the technical efficiency of ports, suggesting that higher wind speeds and wave heights lead to inefficiencies and can help reduce the issue of overcapacity in shipping markets. **Heakel & Khedr** (2010) evaluated how ports in developing countries can leverage economies of scale while addressing the risk of overcapacity. **Yap & Zahraei**

(2018) examined how the initiatives of liner shipping companies to increase their capacity affect the connectivity of key container transshipment hub ports. In 2022, **Cariou and Guillotreau** analyzed how overcapacity impacts competition in the shipping market.

### **1.3 Trends in Container Shipping: the evolution of the container shipping industry, growth in fleet size, and the rise of larger vessels.**

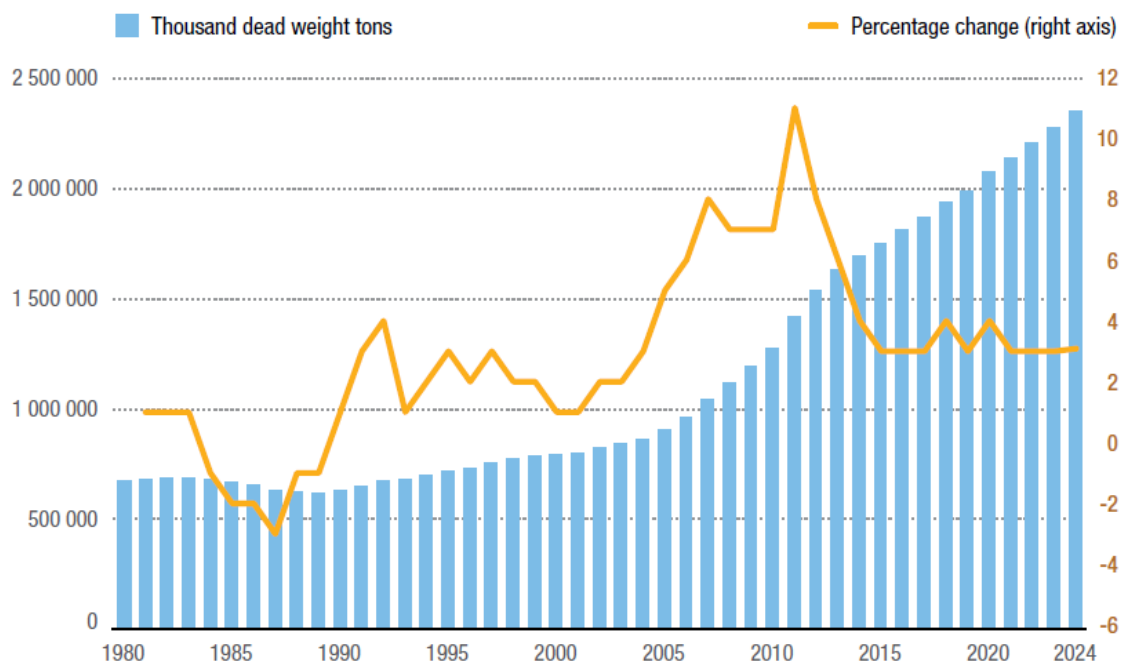
The connection between supply, demand, and market prices forms the global economy and international trade, particularly in maritime and other industries. Understanding the dynamics of supply and demand and also their mutual impacts is essential in order for a company to achieve economic efficiency and stability, confront competition, mitigate complexities, and reach sustainable investment decisions by adopting green policies concerning the environment.

The supply and demand imbalance is defined by the situation in which the company is unable to achieve equilibrium through the use of internal and external characteristics that usually lead to several problems and complexities. The industry's overcapacity issue worsened further when shipping companies were left with an excess of idle vessels and an inability to scale back capacity quickly enough to match the reduced trade volumes.

In the downturn phase after such an economic crisis, consumer demand drops significantly, widening the gap between supply and demand. Nevertheless, carriers continued ordering larger ships in recent years, misjudging the demand for containerships—an oversight that maritime economists also failed to predict. Shipping companies have adopted different approaches to address the issues of overcapacity.

The relationship between supply-demand, and freight rates is crucial for the global economy and international trade. With tighter environmental regulations and increasing competition among shipping companies, businesses must adopt more strategic pricing methods. Strategic pricing allows a company to manage its costs while achieving its profit objectives. By employing effective pricing strategies, companies can generate resources that foster growth and boost operational efficiency.

Another trend in modern container shipping is the move towards larger vessels offering more capacity, which finally leads to fleet underutilization. This occurs when shipping companies with larger fleets provide more capacity than the market demands. This imbalance results in lower-loaded vessels increasing operational expenses. Such an imbalance leads to underloaded vessels, which increases operational costs. Additionally, fuel consumption remains nearly constant regardless of whether the fleet is fully loaded or only partially utilized. Optimization in fuel consumption helps the decrease of energy consumption per transport unit, contributing in less greenhouse gas emissions.



Source: UNCTAD calculations, based on data from Clarksons Research Shipping Intelligence Network.

Figure 1-1: Trends in yearly world fleet growth: Capacity continues to expand in 2023 and 2024 but below the long-term average

Source: UNCTAD (2024) World shipping fleet and services

As it shown from the above figure, by 2023, the growth in ship capacity was faster than trade. The capacity still wasn't enough to meet the demand. It is expected to grow more slowly in 2024 and 2025. This slowdown is due to fewer new ships being ordered, longer building times, and higher costs for new ships. Even though operating expenses went up

and profits were lower than the years of 2021 and 2022, when most types of ships still made money and saw their values rise.

Smaller or financially weaker shipping companies are less resilient in an oversupplied market. These companies lack the means to handle the competition of larger firms better equipped to endure extended periods of market instability. On the contrary, larger containerships can take great advantage of economies of scale. Smaller companies face higher per-unit operational costs, which prohibit them from remaining competitive. This fact forces them to consolidate with other companies, leaving even fewer players in the marine market.



## **2. Causes of Overcapacity**

Global financial crises act as immediate catalysts for change in Liners' management operations and can result in long-lasting recessions throughout the maritime world market. The shipping industry faced multiple economic crises during recent decades such as the 1973 oil crisis and its consequences that followed, the 2008 Global Financial Crisis, the European Sovereign Debt Crisis between 2010 and 2014 and the COVID-19 Pandemic spaiing from 2020 to 2022 which led to operational disruptions that threatened the survival of many shipping businesses (Bucak, 2023).

In the late 20th century, the phenomenon of overcapacity appeared, as global trade increased through the introduction of containerization and the rapid industrialization of developing economies. Containerization transformed global trade by introducing more efficient transportation methods for goods. Containerization enhanced the entire transportation network by enabling faster and more secure delivery of goods at reduced prices through decreased reliance on physical manpower. The expansion of containerization drove major enhancements in transportation infrastructure including ports and containerships alongside highways and rail networks to accommodate the swift increase in goods transportation.

During past years various regions such as Asia along with Latin America and Africa underwent swift industrial development. Containerization increased accessibility to international trade, enabling emerging markets to join global supply chains and develop into manufacturing and export hubs. This industrial growth has been supported by new technologies that improved transportation processes and simplified communication and collaboration across diverse markets.

Overcapacity in the container shipping industry derives from a combination of various factors. Changes in the world economy, misjudgments in growth forecasts, and different external factors such as political developments and shifts in trade policies lead shipping influence shipping companies' investment decisions. Also, higher fuel costs, environmental regulations, and changes in consumers' preferences can make the gap between supply and demand even worse. The combination of all above factors creates unstable market conditions where fleet overcapacity reduces profitability and sets more pressure on shipping lines.

For shipping companies, the interaction of these variables frequently creates a vicious cycle where they are called either to absorb losses or participate in further price wars to maintain market dominance.

## **2.1 Global Economic Fluctuations**

One of the main causes of overcapacity in the containership industry is global economic fluctuations. The containership market is subject to self-reinforcing feedback loops that can result in challenging cycles for the industry. These loops arise when specific market dynamics create patterns that affect supply, demand, and stability. Economic disruptions usually result in a sudden decrease in demand for container transportation.



Figure 2-1: The Seoul Central District Court officially declared the bankruptcy of Hanjin Shipping Co Ltd

Global trade flourished before the 2008 Global Financial Crisis. This Crisis led many shipping companies to modernize their fleets to meet the increasing demand. However, the crisis caused a sharp decline in the need for industrial products, which resulted in a large number of unused containers. . Shipping companies that had invested in larger vessels found themselves struggling with issues of excess capacity, making it harder for them to handle the situation. Unutilized containers remained in ports, container yards, or logistics warehouses causing expenses and in some cases congestion.

The constraints imposed by global external conditions guide shipping companies to reach development decisions. A notable example of mismanagement is the bankruptcy of Hanjin Shipping, which suffered from poor investments and declining oil prices, disrupting a previously positive cycle in the middle of global overcapacity. This situation, combined with a halt in capital flows and a lack of proactive government policies, ultimately led to the downfall of such a significant player in the shipping industry (Song et al., 2019). What's even more alarming is how quickly Hanjin collapsed, especially taking under consideration the size of the company and the extend of its service all over the world.

The COVID-19 pandemic (2020-2022) also influenced the trade market of the containership industry. The sudden implementation of global lockdowns and movement restrictions disrupted Chinese industrial production and halted worldwide manufacturing. Many factories in Asia, the USA, and Europe were forced to close down leading to a decrease in manufacturing production. The need for on-line shopping increased significantly as more individuals stayed at home, especially for electronics and furniture. Also, severe port congestions appeared in ports causing long vessel queues in main ports such as Hamburg, Shanghai, Los Angeles etc. Ports delays lower the overall ability to move containers efficiently, thereby restricting supply.

The recovery is still slow but steady, as predicted for the global economy in 2025. As the shipping industry evolves, various factors will influence global economic trends.

- Geopolitical changes
- New trade policies
- Advancements in automation and AI technology
- Shifts in consumer behavior
- The rise of e-commerce
- Environmental regulations will all play a crucial role.

A well-structured governance framework is essential for shipping companies to manage risks effectively. The shipping industry is characterized by distinct market cycles (Allison Sipping, n.d.). To reduce the effects of these cycles, shipping companies should adopt strategies to make them more resilient and absorb risks from global complexities. Strategies such as understanding economic indicators for more accurate demand forecasts,

routing optimization, capacity allocation, and improved supply chain planning for the customers.

## 2.2 Supply and Demand Imbalance

Freight prices, vessel utilization, and investment decisions are just a few of the market aspects that are heavily influenced by the dynamics of supply and demand in the shipping industry. During periods of strong economic growth, global demand for goods usually increases. This demand can expand international trade when combined with higher consumer purchasing power. Developed economies may import goods such as textiles, raw materials, and food from developing nations. For this reason, the need for container shipping to facilitate these cross-border movements also gets higher.

**Container transport demand** refers to the need for moving goods through containers within intermodal freight transportation. Demand is quantified in ton-miles, which indicates the total amount of goods transported by sea and the distance they cover. Higher volumes of international trade drive an increased need for containerized shipping.

Changes in the demand for shipping services have a direct impact on how many vessels are utilized. When the demand is high, utilization rates rise as the supply of vessels also increases to satisfy this volume of demand. On the contrary, lower demand means that vessels are being underused and are idle. Also, investment decisions are influenced by expectations for future demand growth and market circumstances.

**The supply of container transport** refers to all the resources required to move containers across their journey, whether by land, sea, or air. This includes the infrastructure, equipment, and services needed for smooth transportation. Below are the factors that influence container transport supply (Kim, 2019):

- Global trade volume
- Economic stability
- Port infrastructure and efficiency
- Seasonal variations
- Fuel costs
- Trade agreements

- Technological achievements
- Environmental regulations
- Natural disruptions and weather

Freight rates increase when supply is limited. This forces ships' owners to look for other ways to cover their expenses. The higher rates are, the more advantageous for the ship owners, because this may increase the demand for container transportation. However, freight rates fall when supply is too high, and ship owners may find it difficult to pay expenses such as loan interest and repairs. If the market continues to shrink for long time, older ships may be dismantled, which would gradually reduce the supply, and some owners may decide to sell their ships.

Supply and demand reach balance in a healthy shipping market. The introduction of larger vessels, a halt in the expansion of global trade, and other economic difficulties are some of the variables that could disturb this balance. Shipping firms face a difficult environment as a result of these difficulties. So to face this imbalance, shipping companies implement different strategies such as blank sailings on certain routes, slowing down vessels' speed, and decommissioning less efficient ships.

As new vessel deliveries continue, the supply-demand balance is predicted to deteriorate even further by the end of 2025. Rerouting from the Cape of Good Hope (induced by interruptions in the Red Sea) might provide some short-term solution, but this is insufficient to reverse the overall situation. If demand growth does not accelerate, the industry may experience sustained pressure on rates, possibly reaching 2026.

Although the supply and fleet have grown fast enough since 2010, the supply-demand balance will become tighter in 2024. Ship demand rose as much as 90% due to the crisis of RED SEA and vessels rerouting around the Cape of Good Hope, leading to longer average sailing distances and transit times.

The below graphic shows that in 2024, the supply of ships and total container capacity in the market was 12.1%, while the demand for container shipments required by the global economy ranged between 18.0% and 19.0%. Forecasts for 2025 predict that cargo volumes will grow by only 4.0%, while supply will decrease by just 5.8%. The graphic indicates that fleet expansion is outpacing the growth in cargo volume this year, highlighting the issue of overcapacity (Rasmussen, 2024).

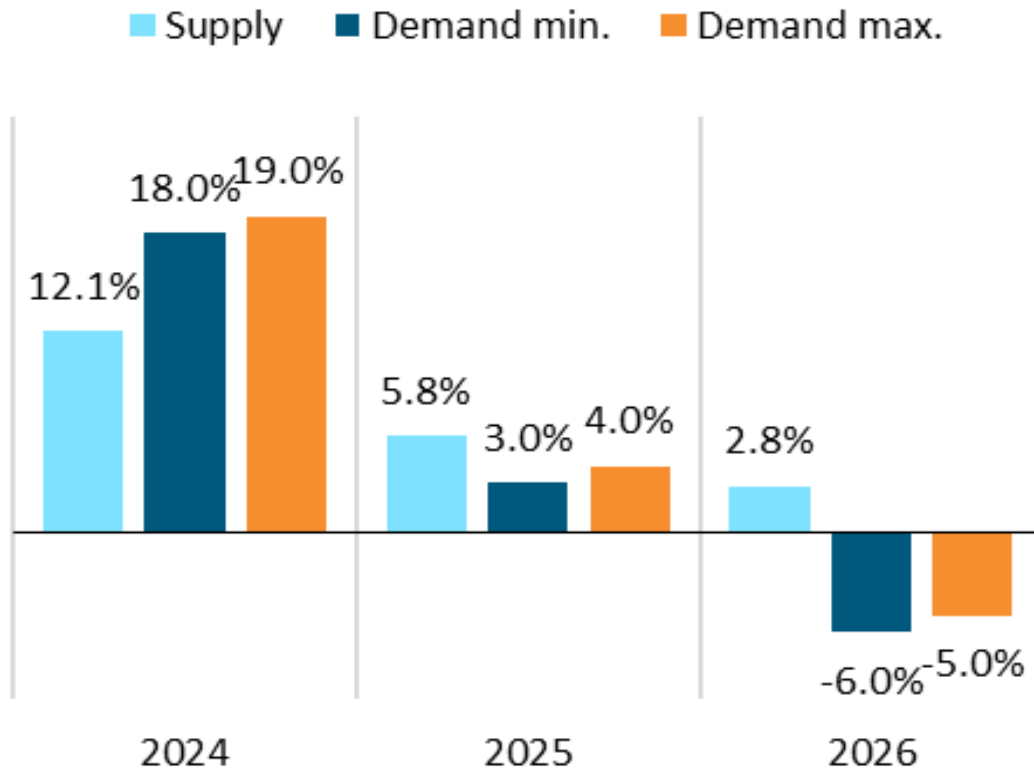


Figure 2-2: Ship Supply and Demand growth

Source: Container Shipping Market Overview & Outlook, Continued fleet expansion darkens outlook, December 2024, BIMCO

The supply and demand in the shipping market is always sensitive and fluctuates frequently. Because of this, everyone involved in the business must stay aware of market conditions at all times. Otherwise, it's easy for those in the shipping industry to encounter challenging situations that can be difficult to overcome.

## 2.3 Fleet Expansion and Inefficient Fleet Management

The shipping industry requires tremendous investments in terms of capital because acquiring, upholding, and keeping ships need massive funds. Purchasing new ones or retiring aged ships highly relies on a business firm's financial position, operational effectiveness, and industry competitiveness. Before starting fleet renewal, companies need

to critically evaluate the marketplace dynamics and consider all internal and external factors.

Inadequate investment would generate long-term issues threatening the shipping company's operations, market share, and financial health. A decline in market share and inefficient operations can also create financial challenges that could even result in bankruptcy. On the other hand, excessive investment based on optimistic forecasts in transportation demand may lead to overcapacity and limited cash flows, prohibiting the company from meeting other financial obligations.

The containership company's profitability highly depends on fleet investment, which is crucial to meeting market demand. Purchasing new ships that are fuel-efficient can enable the company to minimize organizational costs and enhance profit margins. On the contrary, older ships that lack automated navigation systems cannot meet the last-updated safety and environmental standards increasing transit time, and generating additional costs.

The issue of overcapacity in global container shipping has become even more noticeable as companies increasingly turn to larger vessels to achieve economies of scale. These very large ships, which can carry over 20,000 TEUs in a single journey, significantly lower the cost of shipping goods per unit. The decision to order new ships derives also from the need of shipping companies to be proactive among other players in the shipping market. Ordering new ships was often driven by overly optimistic demand forecasts or the need to remain competitive. Additionally, building a new vessel can take several years, in which the market conditions may have shifted.

One major disruption in global shipping demand derives from the ongoing instability in the Red Sea. Attacks from Houthi rebels have forced more than 90% of container ships to avoid the Suez Canal and take a longer, more costly route around the Cape of Good Hope instead.

The below graphic shows the Container Fleet development in Millions per TEU between December 2021 and December of 2025 (BIMCO, 2024). The starting point of this graphic depicts that container fleet capacity reached 24.8m TEUS. The graphic shows a steady increase in container fleet capacity showing the growing demand for shipping services, which ends in December of 2024 as it reaches the 30.6m TEUS.



From December 2024, the growth rate appears to stabilize, likely due to stable market or economic factors. A sudden drop in capacity seems to be caused due to limited demand for global shipping services as per forecasts for December of 2025 that reach 32.0m TEUS. Red Sea unstable conditions are projected to stabilize by 2025, allowing re-use of traditional shipping routes through Canal Suez.

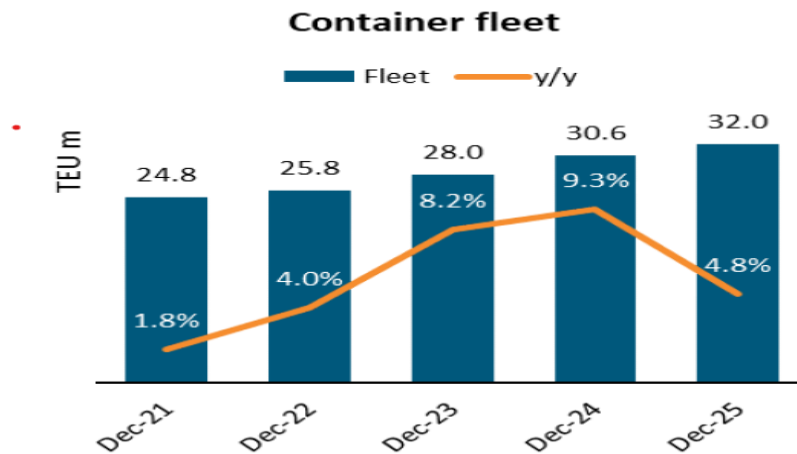


Figure 2-3: Container Fleet growth

Source: Clarkson research, BIMCO

Expanding a fleet often presents challenges in maintaining fleet management efficiency. While liners focus on optimizing cargo loads and routes, underutilized capacity increases per-container operating costs, intensifying financial and environmental pressures.



### **3. Effects of Overcapacity**

The over-capacity issue facing the container shipping sector is expected to get worse in the upcoming years. The length of the crisis will depend on how carriers will handle this matter. There is a strong possibility that shipping companies have to idle a far greater percentage of the fleet than they were previously willing to do. Mega ships might offer an efficient way of goods transportation, but it seems that the liner business has suffered greatly as a result of them (Teepen, 2017). The only alternative is an unanticipated increase in freight volumes if carriers fail to successfully confront this problem. Container shipping is projected to face overcapacity and increasing losses for several years, as that seems unlikely to change.

Furthermore, the fact that there are too many ports and not enough trade in many parts of the world is another issue that contributes to overcapacity. There would be a loss of investment if commerce did not increase to fund government-provided investments. Ports of the Middle East such as Abu Dhabi, Salalah, and Doha have improved their port capacities to meet the rising demand for international trade. In other regions such as Western Europe and China, it appears that the terminal capacity is more than required.

Low freight prices, which reached an all-time low in 2016, have caused the majority of carriers to operate at negative margins since 2015. From 2019 up to today, the industry has experienced fluctuations in profit margins, sometimes negative and sometimes “top positive”. Continued strong profits, elevated freight rates, and market stabilization helped shipping companies to introduce new larger vessels.

The most known effect of overcapacity and low freight levels in the last 10 years is the collapse of Hanjin Shipping Company, the largest Korean carrier. Hamburg Sud which had been acquired by Maersk to avoid the same risk, is another example. It is also believed, that Maersk’s aggressive policy in obtaining new and larger vessels throughout the last years has worsened the situation as Maersk’s vision was to be the dominant of shipping industry.

The issue of overcapacity has also affected apart from shipping companies, ports, global trade dynamics, and freight rates. Carriers are being forced to innovate, merge, and adjust to a keep changing global environment. The innovations include freight adjustments,

alliances, new technologies, and eco-friendly vessels to respond effectively to market pressure for resilience and sustainability.

### 3.1 Freight rate volatility

Freight volatility describes how much freight rates vary between different periods. The issue of freight volatility is really important in supply chain management and the containership industry because it has impacts on pricing, operational planning, and the overall cost of forecasting (Xu et al., 2011). Freight risks have been the main topic in maritime studies as directly influence both shippers' and liners' strategies because they cause instability regarding the transportation cost of shipping goods.

Overcapacity in the container shipping industry arises when the available shipping or transportation supply exceeds the demand. This imbalance can lead to deep economic and operational impacts, including a decline in freight rates. The shipping market runs according to the principles of supply and demand, with the equilibrium point determining the shipping tariff level (Lun et al., 2010) .

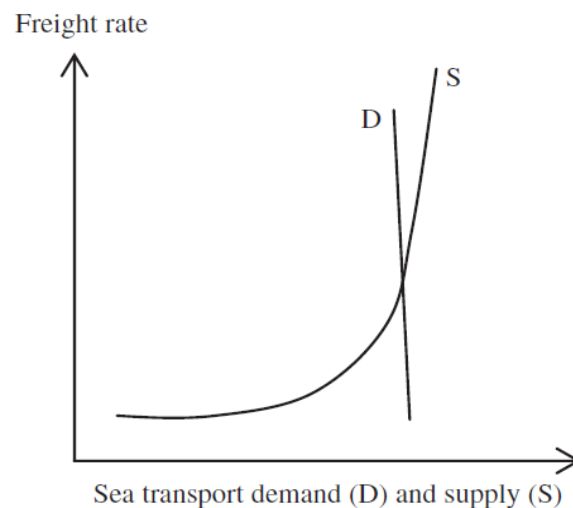


Figure 3-1: Shipping supply and demand functions

*Source: Maritime Economics (Stopford, 1997)*

**Figure 3-1** depicts the basic supply and demand functions within the shipping industry, as described by Stopford (1997). The **supply and demand functions** in the **containership industry** illustrate the forces that shape freight rates, capacity utilization, and overall market dynamics within the maritime industry. The sea transport supply curve (S) is influenced by freight rates, which depend on the capacity of ships. At lower freight rates, the supply curve exhibits elasticity, while at higher freight rates, it becomes inelastic. The sea transport demand curve (D), nearly vertical, reflects shippers' behavior in response to changes in freight rates. Regardless of rate fluctuations, shippers transport their cargo because alternative means of transportation are unavailable.

According to Lun et al. (2010), the freight mechanism in shipping companies is a system designed to optimize the distribution of cargo across various destinations. As illustrated below, the J-shaped curve representing sea transport supply shows the volume of transport capacity offered by shipping companies at different freight rates. Conversely, the sea transport demand curve reflects the quantity of transport services used, at each freight rate. The equilibrium freight rate is achieved at the point where supply and demand meet.

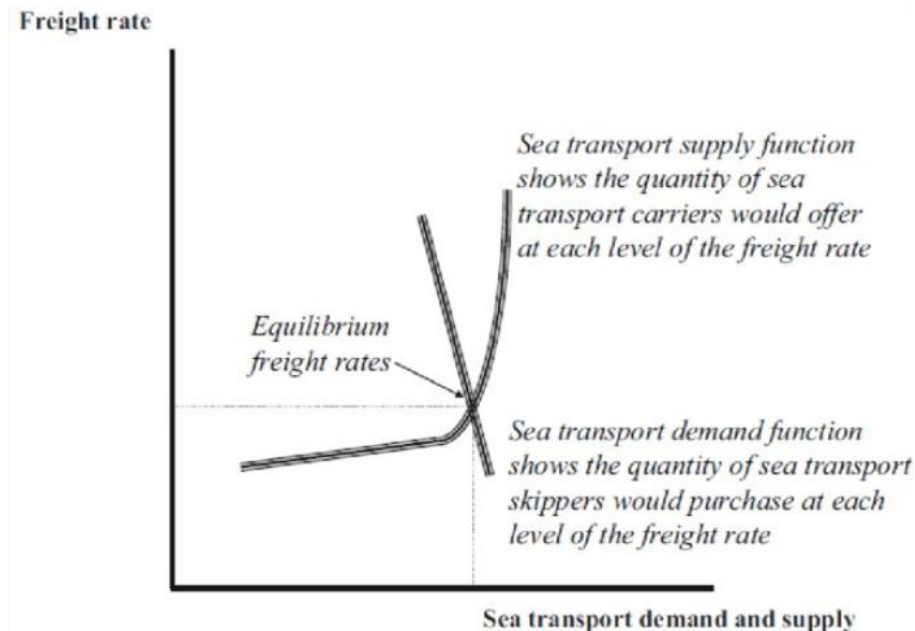


Figure 3-2: The Freight Rate Mechanism

Source: Lun et al. (2010).

The changes in freight rates over the past years reflect the pressure on the global supply chain. Just as the market began to recover from the COVID-19 pandemic, Russia launched its full invasion of Ukraine in March 2022, leading to the highest freight rate indices ever recorded. Then, the Huthi Rebel attack in the Red Sea Area forced the rerouting via the Cape of Good Hope for all goods transported from China. All the above disruptions have multiple effects on freight rate for following reasons (Ruzic et al., 2022).

- High insurance cost for transported goods
- Longer distance and transit time because of route diversions
- Higher fuel cost
- Limitation in container availability
- Change in global trade flows
- Social uncertainty

Over time, ongoing threats to shipping security may result in significant changes in global trade patterns. The industry is looking for ways to reduce risk and find more dependable and cost-efficient transportation routes.

### **3.2 Inefficient Vessel Utilization and Reduced Profitability**

In response to the increased demand during the pandemic, shipping companies invested heavily in new vessels, which reached container availability to its limits. However, as demand began to decline, many of these ships had to operate below their capacity. This overcapacity usually results in the shipping line's reduced profitability. When a shipping company operates at high-capacity utilization, it generates more revenue per voyage as all containers are used. This happens because the income from transporting cargo is directly connected with the cargo volume. By carrying more cargo, the company maximizes the return on each vessel. On the other hand, when the capacity utilization is low, revenues are limited since less cargo is being transported.

Below are key factors for improving operational efficiency, optimizing the flow of goods via container transport (Nissin, Spain):

- Vessel routing optimization and reduced lead times
- Minimizing the vessel's waiting time in ports
- Use of advanced technologies
- Environmental sustainability
- Alliances and shipping consolidations

The industry needs utilization rates above 90% to make enough money to pay for the substantial fixed expenses associated with ship operations and turn a profit. Underutilized vessels have excessive running costs per unit of cargo, which can put a burden on finances or possibly result in losses. Thus, attaining and sustaining high usage rates is essential to the industry's financial stability.

The performance of shipping companies is strongly connected with their financial results, which can be measured through accounting ratios, and the associated risks also relate to the company's operational efficiency, which involves how well they use resources in their production process and manage the distribution of goods (Panayides et al., 2013). Shipping firms often adopt various financial strategies, such as selecting different sources of financing, managing liquidity regarding cash flows, and deciding on the right balance between debt and equity. Additionally, these companies have operational choices regarding ship size, age, and ownership. To ensure a successful business, shipping companies must understand how risk assessment and cost control can influence both their financial performance and overall operational efficiency.

### **3.3 Environmental impact due to lower ship occupancy and increased emissions.**

Vessel sharing occurs when multiple shipping companies collaborate to utilize space on ships, enhancing efficiency and meeting demand. Although companies can invest in larger vessels to lower costs and emissions, they face the risk of underutilization, which can negate those advantages. By sharing vessels, companies can distribute expenses, coordinate tasks, and optimize their investments. This strategy promotes cooperation over competition, allowing companies to work together to boost revenue or reduce costs.

Through collaboration, shipping firms can utilize resources more efficiently, resulting in improved coordination and overall operational gains.

To maintain sustainability, shipping companies focus on **decarbonization** by modernizing their vessel equipment, renewing old vessels to offer larger cargo capacity, and implementing fewer carbon methods even during periods of great global disturbances and instabilities (Georgoulas et al., 2025). The war in Ukraine has significantly affected the marine trade, particularly for bulk shipments of raw materials and liquids or gases transported by tanker ships. The conflict in Ukraine has led to changes in transportation methods for grain, raw cargo, and oil. For instance, with Ukraine being a major grain exporter unable to meet market demands, grain shipments now take longer routes to source supplies from other countries, such as the USA or those in Africa.

After the war broke out, energy prices, including crude oil and gas, soared to their highest levels in decades. This sudden spike in prices impacted the behavior of both companies and households. Many European nations and the United States quickly implemented financial measures, such as price caps and restrictions, to shield themselves from the soaring energy costs. Other sources of oil and gas included countries in Africa, Saudi Arabia, and the U.S. Additionally, limited grain exports contributed to a general rise in food prices. The United Nations proposed measures for price stabilization, such as the Black Sea Initiative (BSI), to ensure the safe transport of grain.

Based on the below data from Transport & Environment **Figure 3-3**, the European ports presently help **to reduce greenhouse gas emissions** throughout the maritime supply chain and highlight the need for ports and policymakers to support environmentally friendly initiatives like port energy supply and appropriate methods for e-fuel bunkering (Lui, 2023). Hamburg container terminal emission reached 152 thousand tons of CO<sub>2</sub> as shown in the below figure.

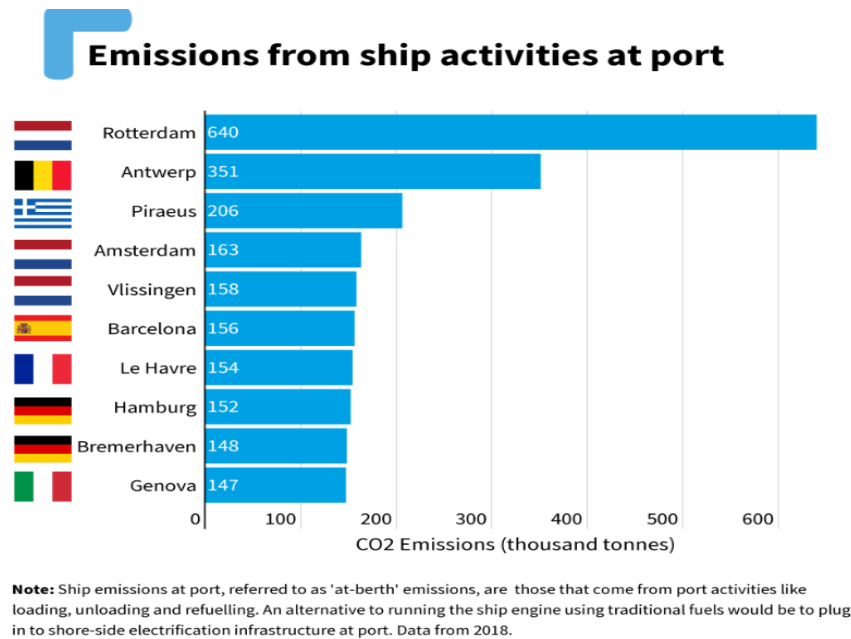


Figure 3-3: Emissions from ship activities at port

Global trade depends on shipping, but ships operate with fossil fuels, which release dangerous greenhouse gases (GHG). Approximately 940 Mt CO<sub>2</sub> (or 2.5 percent) of global CO<sub>2</sub> emissions are caused by container shipping lines annually. Temperature increases brought on by these emissions result in climate change. The International Maritime Organization has set **targets** to mitigate emissions for the shipping industry. For example, Maersk and CMA CGM aim to be carbon neutral by the end of 2050. The primary **obstacle** to zero-carbon shipping is the increased costs, that prohibit zero-carbon ships and fuels from being profitable. Zero-carbon shipping is more expensive than usual fuels. The main **advantage** of this kind of ship is the tax exemptions or port dues deduction.

### 3.4 Key Performance Indicators and other Variables in container shipping management

Key Performance Indicators are utilized across all sectors to assess results and performance over time. The logistics industry has a vast array of KPIs to evaluate performance metrics. In logistics, KPIs assist warehouse managers in quickly grasping

performance levels. This information consists of useful tool for the managers to assess customer satisfaction based on these metrics. In logistics, KPIs also play crucial role. Customers demand quick and precise delivery, along with the expectation that their items arrive without damage. This creates significant pressure on shippers to fulfill these requirements. Customers also pay attention to KPIs, although they may not refer to them as such. They want to know the delivery time for their goods and expect them to be well-packaged and accurate. If a shipper fails to meet logistics KPI metrics, competitors could easily take away their business (Zis et al., 2023; Ship Universe, 2025).

Regarding overcapacity in the container shipping industry, below (Error! Reference source not found.) are the indicators that seem to influence this major problem:

Table 3-1: Indicators that influence overcapacity in container shipping industry

KPIs		Purpose	Target / Flag
1.	<b>Capacity Utilization Rate</b>	Proves how efficiently the container space is utilized.	$\geq 85\%$ is really good $< 70\%$ = reconsider
2.	<b>Fuel Consumption Rate</b>	Proves how efficiently is the fuel consumption per vessel per day or voyage.	New ships reduce fuel consumption approximately 20%
3.	<b>Energy Efficiency Operational Indicator</b>	Measures how ships emit CO <sub>2</sub> per ton-mile of cargo transported.	IMO 2030 target is a 40% reduction in carbon emissions
4.	<b>Carbon Intensity Indicator rate</b>	How much CO <sub>2</sub> emissions intensity per vessel	A- C is acceptable
5.	<b>Schedule's Reliability</b>	Monitors the punctuality of the ship's arrivals	Maersk seems to perform on time $\geq 75\%$
6.	<b>Port's Turnaround</b>	The time the ship needs from arrival at port to departure.	Less than 24 hrs for containers is strong
7.	<b>Vessel Availability / Downtime</b>	Measures the time a ship is functional and operational	The goal is more than 97%



KPIs		Purpose	Target / Flag
8.	<b>Consistency of vessel schedule</b>	Indicates whether scheduled maintenance tasks are completed on time.	The goal is more than 95%
9.	<b>Labor Injury Frequency</b>	Measures crew injuries per million work hours that results in lost working hours	The goal is less than 1.0
10.	<b>Incident Rate Deu to navigation misfunction</b>	Monitors incidents and collisions	The goal is zero tolerance
11.	<b>Fleet Performance Rate at Ports</b>	Monitors fleet performance during Port State Control (PSC) inspections	The goal is 0 detentions
12.	<b>Operating Cost Rate</b>	Measures fixed costs per day for the vessel operation	The goal is to remain $\pm 5\%$ of budget
13.	<b>Unit Cost per TEU / Ton</b>	Calculates the cost the cargo needs to move from one place to another	The lower - the better via route and load planning
14.	<b>Voyage Profitability Rate</b>	The time converts voyage revenue into a daily earnings amount by taking away voyage costs	the profit the ship generates: the higher the better
15.	<b>Cost Control rate</b>	Compares the actual costs to the planned budget.	Remain within $\pm 5\%$
16.	<b>Fuel Sulfur Limitation Rate</b>	Monitors if the global fuel sulfur limits are complied with IMO regulations	Non-compliance incidents should be reported as the compliance needs to be 100%
17.	<b>Environmental Incident Rate</b>	Evaluates pollution incidents by vessels	The target is Zero incidents that damage the environment
18.	<b>Claims for Damage Rate</b>	Measures the shipments with cargo loss or damage.	Less than 0.5% is required

KPIs		Purpose	Target / Flag
19.	<b>Crew Retention Rate</b>	Measures the annual retention of crew or high-level officers	More than 85% is really strong
20.	<b>Ballast Water Management</b>	Monitors the management of ballast water treatment with compliance to IMO standards.	100% compliance must be required

*Note: Data reflects 2025 KPI guidance across commercial shipping and offshore fleet operations.*

### 3.5 Stylized facts in terms of overcapacity in shipping lines

Stylized facts are simplified patterns or trends that are commonly seen across various situations, datasets, or time periods — despite differences in specific details. They are not exact laws or universally measured, but rather general truths that assist in understanding how a system usually operates.

To understand overcapacity, we can look at stylized facts combined with indicators. These describe how fast shipping capacity is growing compared to trade demand, how many ships are sitting idle, and even how global economic changes or new environmental rules affect the market. According to Arroyo Abad and Khalifa (2015), the following points highlight the main signs of overcapacity and the tools used to measure them based on the stylized facts.

#### 1. Fleet Capacity vs. Demand (TEU Supply-Demand Balance)

- ✓ *Stylized Fact:* The mismatch between available vessel capacity (measured in TEUs) and actual global trade volume is the primary driver of overcapacity.
- ✓ *Indicator:* Global TEU capacity growth vs. global containerized trade growth (% per annum).

#### 2. Idle Fleet Levels

- ✓ *Stylized Fact:* High idle fleet levels are symptomatic of overcapacity, where supply exceeds demand.

- ✓ Indicator: Percentage of fleet laid up or idle due to lack of cargo.

### **3. Freight Rates (e.g., Shanghai Containerized Freight Index - SCFI)**

- ✓ *Stylized Fact:* Persistent low freight rates signal prolonged overcapacity and price competition among carriers.
- ✓ Indicator: Average spot and contract freight rates across major trade routes.

### **4. Orderbook-to-Fleet Ratio**

- ✓ *Stylized Fact:* A high orderbook (vessels on order as a percentage of existing fleet) often precedes periods of overcapacity, especially when not aligned with trade projections.
- ✓ Indicator: % of total fleet size currently on order.

### **5. Vessel Utilization Rates**

- ✓ *Stylized Fact:* Low vessel utilization (e.g., below 80%) indicates excess capacity in operation.
- ✓ Indicator: Average vessel load factor (% of capacity used).

### **6. Port Congestion and Dwell Times**

- ✓ *Stylized Fact:* While temporary congestion may reduce effective capacity, long-term overcapacity pressures return once supply chain bottlenecks normalize.
- ✓ Indicator: Average vessel turnaround time and port congestion indices.

### **7. Alliances and Consolidation Levels**

- ✓ *Stylized Fact:* The rise of strategic alliances and mergers aims to manage overcapacity through shared networks and optimized scheduling.
- ✓ Indicator: Number of alliances (e.g., 2M, THE Alliance), market concentration ratios (e.g., Herfindahl-Hirschman Index).

### **8. Global Economic Indicators**

- ✓ *Stylized Fact:* Shipping demand is closely tied to macroeconomic trends, especially global GDP and industrial production.
- ✓ Indicators: World GDP growth, PMI indices, global merchandise trade volumes.

## **9. Charter Rates and Secondhand Vessel Prices**

- ✓ *Stylized Fact:* Declines in charter rates and ship prices reflect weak demand and oversupply conditions.
- ✓ Indicators: Time charter rates, Clarksons' secondhand price indices.

## **10. Environmental Regulations (e.g., IMO 2020, CII, ETS)**

- ✓ *Stylized Fact:* Compliance costs and speed reductions (slow steaming) impact effective capacity and can either mitigate or exacerbate overcapacity, depending on implementation.
- ✓ Indicator: Average sailing speeds, emissions compliance levels.

## **4. Mitigation Strategies**

There are various approaches to confront the effects of overcapacity in the liner shipping industry. These include (Bucak, 2023):

- Increase of freight rates: Raising shipping costs to cover expenses and secure sustainability
- Use of central hubs: improving efficiency in shipping companies by offering more service of supply chain
- Blank sailings: canceling published voyages and reducing number of vessel sailings per month to decrease overcapacity.
- Slow steaming: Reduce ship speeds for more efficient management of fuel expenses
- Reducing fleet size: operate with smaller and less of ships to comply with market needs depending on the market season
- Adjusting shipping routes: Modifying routes to improve operational efficiency.
- Create shipping alliances: Strengthening partnerships between shipping companies to share capacity and confront competition.
- Integration of the supply chain companies: Collaborating with other companies of the supply chain

### **4.1 Integration Strategies in Container Shipping**

Line Integration refers to the strategic practice in which shipping lines expand their roles beyond traditional sea-based operations by integrating services across different modes of transportation. This integration allows shipping companies to offer more flexibility, enhance their resilience against disruptions, and improve overall operational efficiency (Paridaens et al., 2022).

When dealing with disruptions in international shipping networks, shipping companies prove that they focus a lot on Line Integration. However, they were able to control the effects of the disruption by offering alternative transportation methods, such as rail or air freight, ensuring that all manufacturing goods could reach their destinations.

Line integration becomes increasingly important because transport and logistics services are diverse. As ocean freight cargo transport is a standard procedure, carriers have less room to differentiate themselves. This leads to intense competition, where customers often face different carriers that offer essentially the same product. To enhance profitability, shipping lines are looking to integrate their services.

Overcapacity in the container shipping industry has had a significant impact on Shipping Line's integration strategies influencing how they approach both horizontal and vertical integration.

**Vertical Integration** refers to the strategic approach where the shipping company monitor the multiple stages of its supply chain and expand its services beyond just owning and operating container ships (Van de Voorde, 2009). Shipping lines can own port and terminals having the total control. Some large shipping companies might also inspect the production of the containers themselves

Carriers that followed Vertical Line Integration are Maersk, CMA CGM, and MSC. These shipping lines have combined other services apart from transporting containers such as logistics, terminal operations, and supply chain management to provide end-to-end solutions for their customers. By this integration, these services are not provided by external partners but by the internal operation of the same company optimizing efficiency and controlling the entire process. This approach is usually met, especially in times of disruptions of global shipping networks, as carriers can respond quickly in challenges and complexities.

Maersk operates its port container terminals, controlling the loading and unloading procedure of containerships. Maersk also owns and operates logistic warehouses where goods can be stored. On the contrary, other shipping lines such as Hapag-Lloyd, Evergreen, and ONE have adopted different strategic approaches compared to the above competitors. This can be explained because for example Hapag-Lloyd owns the 3PL company Kühne & Nagel that is responsible for logistics services. Evergreen on the other hand, has focused only on fleet renewal without large-scale mergers or alliances. ONE is a relatively new player in the shipping industry. ONE's strategy is focused on optimizing its fleet's efficiency.

Overcapacity has forced container shipping companies to invest in technology and automation as part of their integration strategy. Automated systems (like autonomous vessels and port facilities), digital platforms, and data analytics, companies can improve their operational efficiency. Many shipping companies obtain technology platforms enabling them to track shipments, manage inventories, and optimize the entire supply chain.

With Line Integration, shipping companies can explore new, innovative business models. For example, a company might leverage integrated data systems across the entire supply chain to predict demand more accurately, optimize routes, or reduce excess inventory. Additionally, all integrated models can take advantage of previously unnoticed data or information flow gaps. If the company has access to end-to-end data, it can potentially identify new opportunities for cost savings or offer services that were not previously viable.

Companies may choose to stop unprofitable routes that perform poorly, focusing on more profitable or strategic trade lanes. For example, if a specific route consistently operates with low cargo volumes or suffers from great competition, it might be better to suspend it to avoid continuous financial losses. Furthermore, companies might choose to deploy larger ships or operate fewer sailings with more capacity to achieve economies of scale.

**Horizontal Integration** refers to the strategy of cooperating or merging with other companies in the same industry (Charles Hill, 2008). The ability to coordinate the operations of the merging organizations is essential for successful horizontal integration. This internal expansion strategy usually leads to economies of scale, where costs per unit drop as output rises. Horizontal integration can increase a shipping company's market share and reduce competition. In a period of overcapacity, growth through acquisitions helps shipping companies to mitigate the risk of an investment in new vessels.

A great example of horizontal integration in the container shipping industry is when Maersk Line acquired Hamburg Süd. Both Maersk and Hamburg Süd were large, competing container shipping companies operating in similar markets (Dragomir, 2011). After integration, the clients of Hamburg Süd and Maersk Line took advantage of both Maersk's flexibility on global ocean trade services and Hamburg Süd's end-to-end

services in the north-south trades. Customers of Maersk Line and Hamburg Süd gained from improved products and greater options.

## **4.2 Consolidation and Alliances**

The diversions in shipping capacity to the Middle East are not isolated to that region. They are starting to ripple, influencing other shipping routes and areas, such as the North Atlantic. Shipping companies are reducing their services or allocating fewer vessels and container space on the North Atlantic trade route which connects ports in Europe, and North America. As more vessels are redirected toward the Middle East, less capacity is available for routes like the North Atlantic. This creates shifts in global shipping capacity, which impacts the availability of ships and containers for other trades.

Even though 1.14 million TEUs of containers have been added to the global fleet so far this year, there are still 36 ships missing from the three mega-alliances to serve the 25 Asia-Europe routes (Buxbaum, 2016). If the Red Sea Crisis came back to normal and Suez Canal transits resumed, the carriers would have approximately 54 vessels, each with an average capacity of 14,150 TEU, available for redeployment, totaling about 764,100 TEU. That means that the overcapacity issue will be difficult to solve. However, the situation does not seem to get smooth soon.

Carriers anticipate a large growth in the trade market in the following months, so the additional capacity will be covered. The situation differs across each alliance, with the Ocean Alliance facing a shortage of 20 ships, while 2M and THE Alliance each need 8 more vessels to meet their operational requirements.



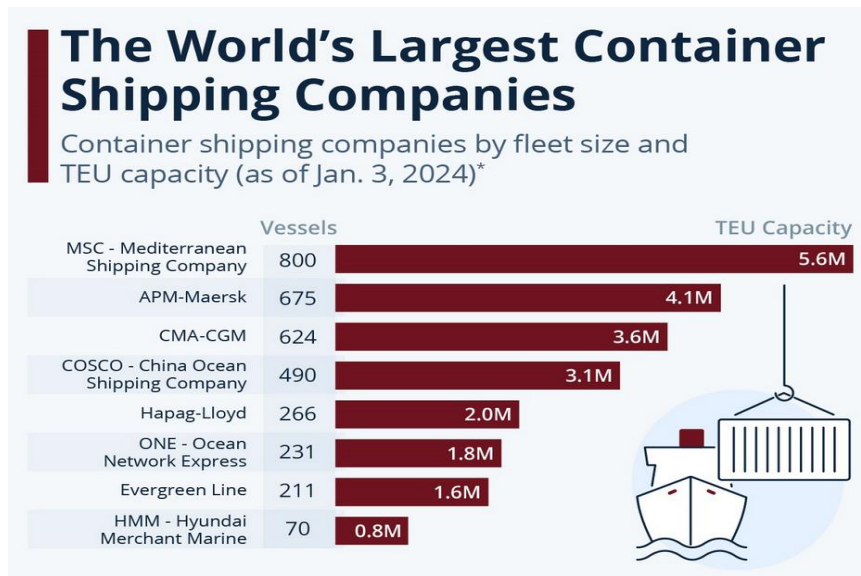


Figure 4-1: The world's largest container shipping companies

Source: Buchholz, K., Statista, Jan 3, 2024

This discrepancy in vessel needs reflects the varying levels of fleet capacity and perhaps differing strategic priorities or expansion goals among the alliances. Ocean Alliance's more significant shortage may indicate a greater challenge in scaling operations. At the same time, 2M and THE Alliance, with their more modest gaps, may be closer to fulfilling their fleet demands. These shortages could potentially impact the alliances' ability to optimize their service schedules or expand into new routes as planned.

Container shipping is considered to be the Primary Mode of Transportation for International Trade that reaches over 90% of traded products (OECD, 2023; Gavalas et al., 2022a), in terms of tonnage per kilometer traveled, container shipping is the most economical and efficient mode of transportation compared to air or road transport. Approximately, more than 30% of the European economy's internal trade and more than 70% of global trade are carried out by sea (Lundgren, 1996; Bodewig, 2022).

The need of **Maritime strategic management** has become increasingly critical in today's globalized world. In container shipping industry, strategic management guarantees efficient resource use, and risk mitigation, and offers the capability to adjust to changing market conditions and technological achievements. Strategic management mainly concerns investments, routes, and alliances (Haralambides et al., 2024) helping shipping

lines restrain their resilience in the vulnerable global trade (Nguyen & Do, 2019). Strategic management in the shipping sector prepares organizations to adjust to fluctuation demand.

### 4.3 Digitalization

Digital transformation depends on improving the information process in supply chains. Digital Information Sharing (DIS) offers a valuable tool in the maritime industry, facilitating data and document exchange. Bookings, necessary confirmations, information processing, shipment tracking, cooperation, customs clearance, payment tracking, taxing, product authentication, customer services, emission reporting, and supply chain regulation compliance result in many financial transactions and data, document, and paperwork exchanges (Yang, 2019; Zeng et al., 2020). Digital solutions are provided by platforms like SAP Shipment EDI, CargoX, Maersk Spot, Maersk **EDI (Electronic Data Interchange)**, CMA CGM eBusiness, Hapag-Lloyd eCommerce, i-containers which also improve marketing, security, sustainability, operational, and financial company's performance.

The container shipping sector depends on different data types to operate efficiently. Every category below has a distinct function and needs to be managed carefully to preserve service quality (Surucu-Balci et al., 2024):

- **Operational data** for daily tasks. Information about terminal operations, container tracking and cargo specifications guarantees effective container movement and reduces downtime
- **Commercial and market data** influencing strategic and financial choices. Freight levels, customer' preferences, and economic indicators enable stakeholders to stay competitive in a changing shipping environment.
- **Regulations data** are essential for a company to comply with legal standards to prevent possible penalties or delivery delays. Correct data submission accelerates customs formalities so the consignee receives his cargo immediately after arrival
- **Performance data** maximizing financial results. This helps them make smart choices to grow and stay competitive. For ships, it includes information about how much fuel they use, when they need repairs, and how long their trips take. This helps

them work more efficiently and be kinder to the environment. For ports, it details how things are running, which helps shipping companies and port workers provide better service and avoid traffic jams

The shipping industry benefits greatly from high-quality data, which improves relationships, operations, and environmental sustainability. Better service and proactive problem solving are made possible by increased supply chain visibility. Furthermore, improved profitability is a result of fewer delays and better cost control. Shipping companies, agents, and customers all gain trust when data is clear and consistent. Last but not least, the industry can implement greener practices, like cutting idle hours and optimizing routes for fuel economy, thanks to high-quality data. As a result, customer has larger satisfaction improving the client experience.

Artificial intelligence (AI) has been of considerable assistance in many sectors of the maritime industry. It improves precision, works more effectively, and increases creativity. AI, predictive modeling, and supply chain management also significantly affect logistics and, importantly, provide elements of international trade. AI has provided quality improvements regarding supply chain transparency to support predicting challenges and optimizing operational procedures.

The absence of digitalization created many challenges in the logistics industry. First of all, limited access in operational data causes huge delays. Secondly, operational cost was higher due to insufficient sources for labor, delivery, and inventory handling. Last but not least, inefficient optimization of the vessel schedule led in more transit time and higher fuel cost.

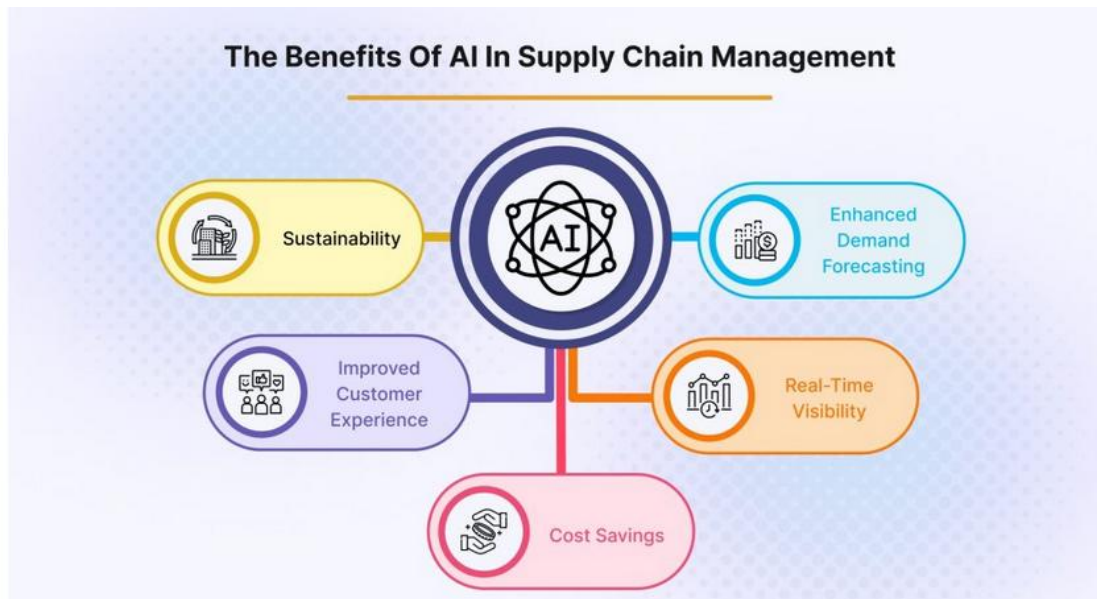


Figure 4-2: The Benefits of AI in Supply Chain Management

As indicated in **Figure 4-2**, significant technological changes are needed to keep up with the competition and the growing demand. Customers demand accurate, real-time tracking with deliveries made on time. Customers expect faster and more reliable deliveries. Also, optimizing transportation routes and reducing emissions with logistics operations improves sustainability. So, below are the benefits of AI in Supply Chain Management (Sinay, 2024):

- **Forecasts about customers' demand.** Artificial intelligence relies on historical data, market trends, and seasonal behaviors to improve demand forecasting accuracy. It also eliminates inventory over- or understock since it optimizes operational procedures.
- **Real-time monitoring.** The customer can follow the container shipment through the entire supply chain. So, business transparency is improved as the customer has access to the whole route container trip. In case the container is delayed at a port, the customer receives live updates on the exact location of the products.
- **Cost savings.** AI offers autonomous delivery systems to improve last-mile delivery. As a result, it decreases delivery times, improves reliance on human effort, and reduces costs. Robots handled by AI can offer automation in inventory procedures such as sorting, picking, and packing.

- **Sustainability.** AI helps supply chains more efficiently predict demand and reduce waste and surplus stock. When demand is predicted more effectively, companies can match actual demand with their production levels, requiring less disposal and markdown of unsold products. AI can help analyze the sustainability of suppliers to ensure they follow environmental standards. This allows organizations to select ethical and sustainable sources and promotes sustainable practices throughout the supply chain. Last but not least, AI systems can monitor and improve energy consumption in many stages of the supply chain, from manufacturing to warehousing.
- **Customer's experience is improved.** AI improves customer experience by making operations more efficient. AI can provide personalized delivery options by selecting the most convenient delivery methods adding more flexibility. This builds stronger relationships between company and customer improving customers loyalty. In addition, using AI allows tasks to be automated and errors and weaknesses in systems mitigated, for assuring delivery of products in a timely manner and at a quality depth.

Artificial intelligence changes the supply chain system to a smart supply chain by detecting inefficiencies, providing flexibility, mitigating errors and enhancing the overall customer experience.

#### **4.4 Choice of Competing Transport Modes and (New) Trade Corridors**

Overcapacity in container shipping can affect and is affected by changes in transport preferences and the rise of new trade routes. When the global fleet exceeds the trade volume, freight rates decrease, making maritime transport temporarily more appealing than other options like rail or air. However, persistent overcapacity may lead shippers to seek more dependable, flexible, or multimodal solutions. As overcapacity reduces maritime shipping expenses, other transport options might experience pricing challenges. If port congestion or delays increase, customers may search for alternatives even if they are more expensive. Changes in global manufacturing are altering global trade paths.

Overcapacity becomes a bigger issue if ships remain in traditional routes (like Asia-Europe) while demand shifts to less served paths.

Factors that shipper take under consideration when they choose the mode of transport are the following:

- Cost of transport
- Reliability and service regularity
- Security of goods
- Speed
- Nature of goods

The most preferred and traditional way of transporting goods instead of sea transport is air, road, rail, pipeline, and tube freight transport. **New mobility trends** have started to appear, promising significant improvements in ways of good's transport. A variety of mobility trends are surfacing that hold the potential to greatly enhance the transportation of our cargo from point A to point B. Below are several examples:

#### **Carbon neutralisation:**

The transportation industry creates a lot of CO<sub>2</sub> emissions, but increasing pressure from climate goals is pushing shipping companies and carriers to reduce their carbon footprint. Many industries are switching to cleaner vehicles and using greener fuels such as ethanol and biodiesel. There's also a large interest in using sustainable aviation fuel for planes and hydrotreated vegetable oil for diesel engines. However, hydrogen fuel cells are not commonly used because their current production methods are not very environmentally friendly.

#### **Electrification:**

To reduce fuel consumption and turn to cleaner energy, new electric vehicle technologies are being created. More people are using electric cars. In supply chain industry, there are many efforts to convert from conventional trucks and vans to electric. Problems such as battery lifetime, charging infrastructure, and driver training continue to create obstacles. Even so, things are starting to improve thanks to better technology and support from governments, especially for bigger vehicles.

**Intermodal transport:**

Using different types of transport for different parts of a delivery isn't just a new idea. Logistics companies prefer the intermodal transport because it saves money and makes things run smoother. Trains and ships produce fewer emissions than trucks or planes. Last but not least, Railroads and ships often follow fixed schedules. This makes it easier to plan large shipments and avoid delays.

**Big data analytics:**

Money still matters most, but big data is quickly becoming just as important. It uses lots of information—like GPS and vehicle sensors—and runs it through smart programs to find patterns. In transport, this helps companies track trips better, use less fuel, avoid delays, and adjust routes more easily.

**Automation:**

Shipping and logistics are getting more automated. This helps fix problems like not having enough workers or not having access to certain equipment. While it's not everywhere yet, automation is starting to make a real impact. We're seeing more use of driverless vehicles, robot arms for picking items, systems that move pallets automatically, and tools that check product quality on their own. (Platell, 2024)



## **5. Development of Shipping Alliances**

Global alliances have emerged as a key characteristic of container shipping. They consist of arrangements among shipping companies (carriers) regarding operational issues such as space and vessel sharing. The main goal of these alliances is to achieve economies of scale and cover a larger service scale. The first alliances that arose in the mid-1990s created a strategy for collaboration between smaller carriers but nowadays alliances serve mostly the largest container shipping lines.

Alliances have enabled shipping companies to obtain and operate large vessels, which has lowered their costs per unit. Without these partnerships, some companies would not have been able to secure their existence during periods of strong competition. The recent trend of ordering these large vessels has contributed to overcapacity. Companies to mitigate the effects of overcapacity decrease their service frequencies, reduce direct port-to-port connections, leading to schedule unreliability and increasing container delivery transit time. As a result, shippers have to confront additional and unexpected costs, maintain extra inventory, or use other storage sources since they cannot handle the uncertainty in delivery schedules.

The biggest global alliances, 2M, Ocean, and THE Alliance, which have been working together since April 2017, control over 80% of container trade and bring together the world's top eight container shipping companies. These three alliances serve more than 90% of the total shipping capacity on East-West trade routes, where most of the container traffic happens.

Alliances may lead to competition issues in an increasingly concentrated market. The leading four carriers held 60% of the global container shipping market. These global alliances enhance the market power of carriers and carry various implications. A significant observation is that the largest carrier now holds approximately 19% of the global market, surpassing the market share of any global liner alliance before 2012. This indicates a change in the dynamics of modern alliances. Unlike earlier alliances that focused on cooperation and sharing market share, current alliances are led by a few carriers with much stronger individual market influence.



Upgrading ports to accommodate mega-ships typically depends on public funding, either directly or indirectly. It is essential to use these public funds effectively and to have strategies in place to reduce risks. Accurate forecasts of cargo flows, particularly from shippers, are vital when planning new port projects. Carriers that request new facilities should be obligated to utilize them to prevent the underutilization of ports that have received public funding. In the EU, stricter requirements could be enforced for port projects financed by EU funds or the European Investment Bank to ensure proper usage. Furthermore, establishing uniform port pricing regulations, ideally on a global or at least regional scale, could help diminish the market influence of shipping alliances and ensure that port projects are well-conceived and advantageous.

## **5.1 Overview of the Shipping Alliances**

Global alliances play a significant role in container shipping today. In the past, shipping companies mainly worked together by aligning prices and capacity. However, in the last twenty years, they have established global alliances that allow competing firms to share vessels. This collaboration enhances their efficiency and expands their service offerings. The nature of these alliances has changed over time. Today, there are only three global alliances, each made up of two to three very large companies of similar size. This is different from less than ten years ago, when alliances mostly helped mid-size and small carriers achieve economies of scale.

Liner shipping carriers offer services to shippers with regular schedules between ports, mainly using container ships. It is one of the three main types of shipping, along with industrial and tramp shipping. The cargo belongs to the industrial operators who manage the ships, focusing on reducing delivery costs, mainly in bulk trades like crude oil and other commodities. In contrast, the cargo availability of tramp shipping regulates the ship schedules. Currently, containerized transport has the largest portion of liner shipping activities, which also includes car carriers and cruise ships.

Global alliances involve collaboration on the use of ships, sailing schedules, itineraries, containers, and shared terminals. Essentially, this cooperation leads to a complete integration of service capabilities. However, it does not include joint sales, marketing,

pricing, shared ownership of assets, revenue pooling, profit or loss sharing, or joint management. These features set it apart from other types of cooperation in liner shipping. The following categories can be identified (Blackbud, 2025):

- Slot charter agreements (SCA) are when shipping companies agree to share a portion of a vessel's capacity for a set period of time. One company operates the ship, but other companies also get to use a part of the ship's space. This helps all the companies expand their reach and offer more services without needing to own the whole ship themselves.
- Vessel sharing agreements (VSA) are when shipping companies work together to meet demand on specific trade routes by sharing vessels that are owned or operated by different companies. Global alliances are like a big collection of these types of agreements happening between the same companies all over the world. Unlike slot charter agreements, which are mostly legal contracts, strategic alliances focus more on working together to improve operations.
- Consortia are alliances of shipping companies that collaborate to lower expenses for a particular maritime service. Each consortium has agreements among its members to coordinate their operations. These agreements may involve slot charter arrangements or vessel sharing, allowing them to share space on ships or work together in other ways to enhance service efficiency.
- Conferences are agreements where shipping companies work together to set common freight rates and control their capacity. While conferences still exist in some parts of the world, they are not as important as they used to be.
- Joint ventures happen when two or more companies come together to create a new business that they control together. Unlike regular global alliances, where each company still has control over its own decisions, a joint venture means the companies share control over the new business and work together as one entity.
- Mergers and acquisitions are the strongest form of cooperation because they involve companies fully combining their operations. Even though the companies become one, they may still keep their original brand names. For example, APL might still operate under its name, even though it's now part of the bigger CMA CGM Group. This means the companies work together as one, but some parts may still appear separate to the outside world.

Ocean carriers often use a mix of cooperation strategies at the same time. For example, carriers in the same global alliance might also share vessels with carriers from other alliances, especially on specific trade routes. Some carriers pursue mergers and acquisitions while staying in alliances. Each carrier chooses which mix of these strategies works best for them. For instance, MSC (Italian-Swiss) focuses on growing by acquiring ships rather than companies and only joined alliances in 2015. On the other hand, Hapag-Lloyd (German) has been part of global alliances since 1989 and has bought several companies, but has avoided buying mega-ships.

## **5.2 The evolution of strategic alliances**

The shipping industry faces specific challenges that complicate the use of a standard market competition model. These challenges consist of significant fixed costs that prohibit easy entry or exit from the market. As a result, it is evident that if shipping companies engage in hard price competition, it could result in price instability and negatively impact the industry.

Before 2006, liner shipping conferences were prevalent, allowing companies to set prices and schedules together, which contributed to stability. However, this arrangement restricted competition. In 2006, the prohibition on shipping conferences prompted companies to form joint ventures and partnerships, allowing them to work together while maintaining competition in some areas. Between 1998 and 2018, four waves of alliances developed as a result of globalization and the increasing costs of running large ships. As global trade expanded, shipping companies sought to cover more regions and formed alliances to share costs and enhance their reach.

In past years there were three main alliances: CKHY, Grand Alliance, and New World Alliance (Merk et al., 2018; Law, 2020). These three alliances controlled more than 30% of the global shipping market. After 2018, three new alliances were created: 2M, Ocean, and THE. The control of these alliances of the global container shipping capacity reached approximately 80%. This proves that the market has changed and is headed towards big players.

This may lead to different outcomes: having fewer carriers in each alliance might simplify decision-making, but the similarity among carriers could also result in increased conflicts within the alliance, particularly if the carriers are less complementary than they used to be.

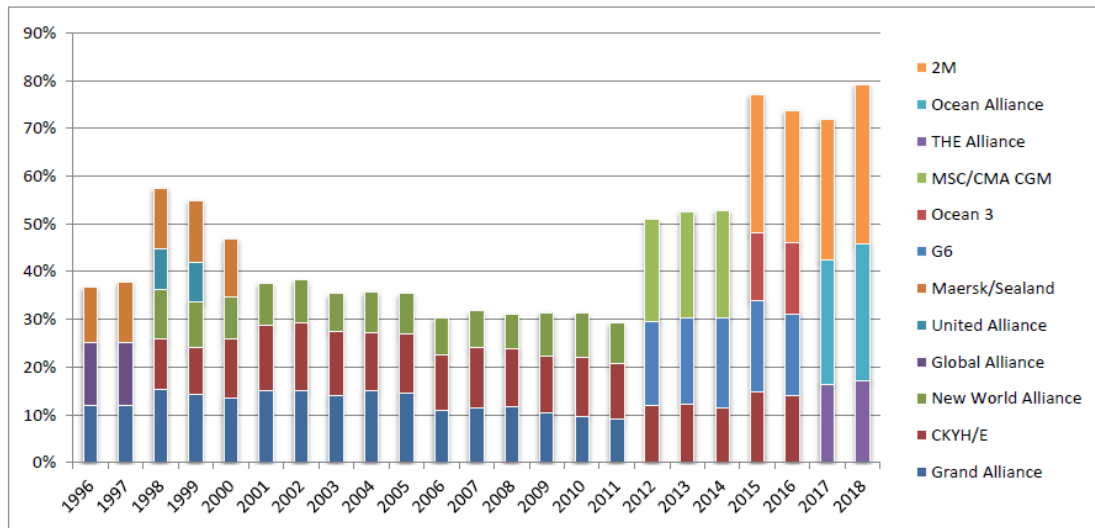


Figure 5-1: Global market share of global alliances 1996-2018

Source: Merk et al., 2018 (container carrying capacity)

The evolution of shipping alliances can be broken down into four generations. The first generation, starting in 1996, involved large alliances that quickly fizzled out, except for the Grand Alliance. The second generation was more stable, with three main alliances (New World, Grand Alliance, and CKHY) that lasted longer. A significant change was initiated by the G6 Alliance, the third generation of alliances, which consisted of carriers from the New World Alliance and the Grand Alliance. The G6 Alliance posed a challenge to larger carriers that had previously been excluded from alliances. As a result, Evergreen became a member of the CKHY alliance (now called CKHYE), while MSC and CMA CGM formed a partnership in 2012 and later collaborated with Maersk to establish the P3 Alliance in 2014.

The CKYHE Alliance, which comprised of Cosco Container Lines, "K" Line, Yang Ming Line, Hanjin Shipping, and Evergreen Line ended for many reasons. The most important reason was the lack of efficient management, especially with Hanjin Shipping. Furthermore, there were difficult market conditions due to low freight levels and overcapacity. As a result, Hanjing Shipping could not stand these circumstances and

announced bankruptcy in 2017. After this, Evergreen Line joined the Ocean Alliance, and Cosco merged with China Shipping Container Lines in 2015.

### 5.3 The drivers of consortia and strategic alliances

Alliances help shipping companies improve their services by offering a more extensive global network. The main reason for joining alliances is to provide broader coverage and more services to customers. Many shipping companies are strong in certain regions due to experience and loyal customers, and alliances with companies that have strengths in other regions allow them to offer a wider network. Large shippers prefer to work with a few companies that have interconnected routes, and alliances help shipping firms build networks big enough to compete for these contracts.

The key motivations for strategic alliances are included in the table below (Ryoo and Thanopoulou, 1999; Midoro and Pitto, 2000; Evangelista and Morvillo, 2000, Sakshi et al., 2023).

Table 5-1: The key motivations for strategic alliances

	Drivers	Broader Motivation
<b>Efficiency driven</b>	<i>Risk sharing (commercial and economic)</i>	
	<i>Reduce financial pressure</i>	
	<i>Reduce/moderate oversupply risk</i>	
	<i>Achieve economies of scale (utilization rate)</i>	<i>Try to survive by joining market leaders</i>
	<i>Strengthen bargaining power against terminal operators and port authorities</i>	
		<i>"Stay closer" to main direct competitors</i>
<b>Market driven</b>	<i>Broader geographic coverage</i>	<i>Reinforce own leadership by cooperating with "satellite" carriers of smaller size</i>
	<i>Entry in new markets</i>	
	<i>Higher service frequency</i>	
		<i>An intermediate "step" in the pursuit of a merger</i>
<b>Knowledge driven</b>	<i>Better knowledge of the economic and financial structure of the partners</i>	
	<i>Better knowledge of partners' strategies</i>	

Source: Midoro and Pitto (2000) and Panayides and Wiedmer (2011).

**Efficiency and Cost Reduction:** When shipping lines collaborate, they operate larger vessels, leading to lower costs through economies of scale. In this way, they share the risk of any loss due to unstable market conditions. They can also confront demand between

shipping lines, improving efficiency. Additionally, this partnership increases their negotiating strength with terminal operators and port authorities.

**Stable and regular services in shipping market.** To remain competitive, shipping must provide a regular schedule. For instance, many carriers have weekly departures from each port. This, however, demands a significant number of ships. By forming alliances and sharing their vessels, they can maintain weekly services on the same routes expanding their service coverage.

**Knowledge Sharing:** Joining an alliance helps shipping companies gain insights into the market and their competitors. They can gather important information from their partners, who might also be competitors, to stay ahead in the industry.

Technological disruptions can significantly influence mergers by affecting the proportion of fixed costs relative to total costs and creating additional chances to achieve economies of scale (Fusillo, 2009). In the liner shipping sector, developments like containerization and the subsequent trend towards larger container ships have been, and continue to be, key factors driving horizontal consolidation within the industry.

## **5.4 Distribution of capacity across carriers**

With regard to *efficiency-related drivers*, consortia and alliances provide shipping lines with the opportunity to deploy bigger ships and experience cost savings as a result of economies of scale and higher utilization rates, by pooling the demand of multiple carriers (Agarwal and Ergun, 2010). These forms of horizontal cooperation also strengthen the bargaining power of the involved carriers *vis-à-vis* terminal operators and port authorities, as they pool the capacity deployed in a specific port (Heaver et al., 2001).

Table 5-2: The motivations underlying consortia and strategic alliances

	<b>Drivers</b>	<b>Broader Motivation</b>
<b><i>Efficiency driven</i></b>	<i>Risk sharing (commercial and economic)</i> <i>Reduce/moderate oversupply risk</i> <i>Achieve economies of scale (utilization rate)</i> <i>Strengthen bargaining power against terminal operators and port authorities</i>	<i>Try to survive by joining market leaders</i>  <i>“Stay closer” to main direct competitors</i>
<b><i>Market driven</i></b>	<i>Broader geographic coverage</i> <i>Entry in new markets</i> <i>Higher service frequency</i>	<i>Reinforce own leadership by cooperating with “satellite” carriers of smaller size</i>
<b><i>Knowledge driven</i></b>	<i>Better knowledge of the economic and financial structure of the partners</i> <i>Better knowledge of partners’ strategies</i>	<i>An intermediate “step” in the pursuit of a merger</i>

*Source: Authors’ own elaboration from Midoro and Pitto (2000) and Panayides and Wiedmer (2011).*

## **6. Comparative Analysis of the 2 Alliance and the Ocean Alliance**

Analyses reveal that the shipping market's capacity is increasingly dominated by these major players. Many smaller liner companies hold minimal market share and often lack the necessary capital to enter the liner shipping sector, which has high entry barriers. The imbalance between supply and demand in this market has intensified competition among container liner companies. To protect their market share, larger companies are willing to invest significant amounts of money, even at a loss, to maintain their shipping capacity on various routes. In contrast, smaller liner companies do not have the financial resources to compete in this "market share defense war," leading to growing operational losses. As a result, they may face bankruptcy or be acquired by larger firms, causing their market share to be redistributed among the bigger companies. This trend is leading to an increasing concentration of market capacity and a polarization effect within the industry.

### **6.1 Overview of the Alliances**

According to the Alphaliner report of 2024 below are presented the statistics of the market share of the leading three shipping companies :

1. Mediterranean Shipping Company (MSC) achieved a record market share of 19.1% by the end of July 2024. (Shhuler, 2024)
2. Maersk Line had a market share of 14.97% as of September 10, 2024 (PortNews)
3. CMA CGM represented 12.64% of the market on September 10, 2024 (PortNews )



Table 6-1: Top alliances have been formed today

Container liner company	Alliance sharing agreement (VSAS)
APM-Maersk	2M
Mediterranean Shg Co	
COSCO Group	Ocean Alliance
CMA CGM Group	
Evergreen Liner	
Yang Ming Marine Transport Corp	THE Alliance
Hapag-Lloyd	
ONE (ocean network express)	

Data source: Alphaliner

These statistics prove the MSC's remarkable growth, surpassing its previous record and making it as the top player in global container shipping. Alphaliner also highlighted that COSCO Shipping Lines and Hapag-Lloyd hold the 4th and 10th positions in capacity rankings.

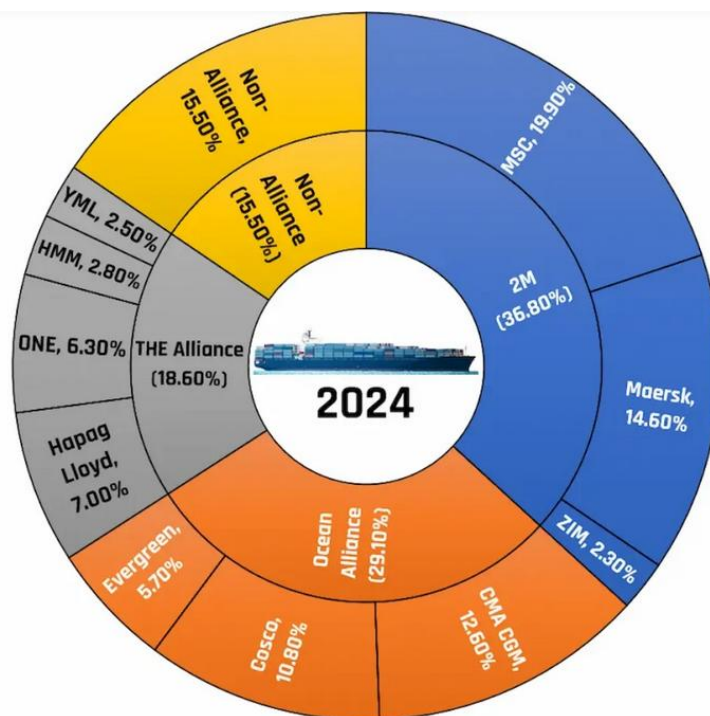


Figure 6-1: Alliances Statistics

Image data source : Alphaliner

It is already announced on global container shipping alliances that the OCEAN Alliance, has renewed its operational partnership for an additional five years up to 2032. The market share of the shipping alliances looks like the figure above. Ocean Alliance's announcement is important for several reasons (Burigana, 2022; Manadiar, 2024, Feb).

- The 2M alliance, currently the leading global container shipping partnership between MSC and Maersk, will end in 2025. Once this occurs, Ocean Alliance will become the largest global container shipping alliance
- A new alliance called Gemini Cooperation, formed by Maersk and Hapag Lloyd, is set to launch in February 2025 and is projected to have a 21.60% market share, making it the second-largest global container shipping alliance.
- THE Alliance, which includes ONE, YML, and HMM, remains the smallest with a reduced market share of 11.60%.
- Currently, MSC, the largest container shipping line in the world, operates independently with a strong market share of 19.90%.
- Non-Alliance lines, including ZIM, are expected to increase their overall market share to 17.80%.

## **6.2 2M Alliance, 10-year Vessel Sharing Agreement**

The 2M Agreement aims to allow the parties to exchange vessels for the Trade and to enable them to establish collaborative working relationships related to this. This agreement would last 10 years. If a party wants to leave, they must give at least 2 years' written notice. However, no one can officially start that 2-year countdown until after the agreement has been in effect for 8 years.

The parties are:

1. A.P. Moller-Maersk A/S,  
trading under the name of Maersk Line ("Maersk") Esplanaden 50 1098 Copenhagen  
K, Denmark
2. MSC Mediterranean Shipping Company SA ("MSC")  
12-14 Chemin Rieu 1208 Geneva Switzerland

According to the agreement authority (Maersk/MSC Agreement FMC, 2014) would include below articles.

- **Vessels:** The parties involved would agree on how many ships to use, how big they are, and how they'd operate. They're starting with approximately 97 ships. They can increase that number to up to 130 ships, without needing to change the agreement. Each party will provide ship capacity as they agree together, and they can also talk about adding new ships or removing old ones in the future. The parties can agree on which ports to visit and when they should skip them (blank sailings)
- **Capacity allocation:** Each party in the agreement gets a set number of container spaces (called "slots") on every service and route, based on what they agree on together. The goal is to keep things as fair as it can be and as balanced as possible between the two sides. If one party wants to buy or sell some of their slots for a particular trip, they can do so with the other party. If that's not possible, then they're allowed to trade slots with outside companies, as long as it follows the rules.
- **Agreements with third parties:** To make everything run as efficiently as possible, the parties agree to end a list of older agreements. Once this new agreement starts, neither party is allowed to make deals with other shipping companies to share, buy, or sell container space unless this agreement specifically says they can. If a party does sell container space (including refrigerated containers) to someone outside the agreement, they still have to follow the financial rules set by the group.
- **Ports and terminals:** The parties can agree on which terminals their ships will use and how much cargo will go through those terminals. Terminals will be chosen based on practical factors they agree on, and they can also consider if one of them owns part of a terminal. Any changes to the chosen terminals need both parties to agree. Each party pays for the terminal costs related to their own containers. For other shared terminal costs (like joint fees), they can agree on how to split them.
- **Separate identities:** Each party keeps its own business identity and runs its own sales, pricing, and marketing separately. This agreement doesn't create a new company or make them legally responsible for each other. They are not allowed to share sensitive business information with each other unless it's absolutely

necessary to make this agreement work. That said, they can still collect and share operational info—like cargo forecasts, stats, reports, or other data—if it helps run things smoothly, as long as it follows the rules in the agreement.

- **Administrative details.** The parties can talk and agree on general rules and procedures needed to run this agreement smoothly. They can write these details down in separate documents or manuals if they want. These rules can cover things like how cargo is accepted and handled, who's responsible for loss or damage, insurance, dealing with claims, handling dangerous or unusual cargo, and what happens in emergencies

### 6.2.1 MAERSK

Maersk Line is widely known as the world's largest container shipping company. Maersk Line's rapid growth to the highest position of the global container shipping industry is truly impressive. This success is attributed to a significant decision made by Maersk Mc Kinney Moller back in 1973. He decided to enter the container shipping market, a risky strategy and the highest investment the AP Moller group would ever made.

Through the years, Maersk grew fast and became a leader in global shipping. Today, the company operates the world's largest fleet of container ships and has about 100,000 employees working across 130 countries. They run 700 ships and serve around 59,000 customers worldwide. To support all of this, they've set up over 300 offices in 130 countries (Petersson et al., 2019).

Maersk also built major service centers in countries like Denmark, the Philippines, India, and China. These centers are managing global operations and supporting both customers and staff. Furthermore, thanks to its sister company APM Terminals, Maersk has access to 343 ports and inland transport services in 61 countries. This huge network makes it possible for them to move goods efficiently all over the world.

Transnational companies are different from regular international companies in a few important ways. They don't just operate in many countries—they're set up to manage their activities across borders in a very organized and connected way. With the same way, Maersk operates its offices. Usually, Maersk has a central headquarters that helps set shared goals and strategies for the whole company. What makes Maersk stand out is she

manages different markets effectively, using a mix of global thinking and local understanding. Its resources, like offices and skilled staff, are spread out across many countries, but they all work together under one clear management system. The top leaders play a big role in making sure everything stays on track. They provide a structure where local teams can make decisions, but always with clear priorities and support. If something small needs adjusting, leaders might just monitor the situation. But if it's a big issue, they might step in more directly—sometimes by creating special teams or task forces to help solve it.

Maersk Line is a good example of this kind of company. Right after World War II, they started opening a few offices outside Denmark. These offices later became key parts of their global container shipping business, especially after the 1970s when trade started expanding. As Maersk grew, they set up important offices in major countries and smaller branches in ports or key inland areas. In places where there wasn't enough business to run a full office, they worked with local agents instead. This smart setup helped Maersk grow into a strong transnational organization.

Maersk Line's focuses on offering top-quality service, having a strong global presence, and providing full door-to-door delivery. This idea was summed up in their motto: "service all the way." To reach this goal, they knew they needed excellent ships and equipment, skilled and motivated employees, low costs, personalized service for each customer, and smart investments—especially in special equipment for niche markets.

Their plan for growth was solid. It included running more frequent shipments in places they already served, and also expanding into new regions. They wanted this growth to be mostly organic—growing step by step, using their own experience from the successful container operations they had with the Panama line.

### **6.2.2 MSC**

Founded in 1970 as a tiny, traditional ship operator, Mediteranean shipping company has quickly expanded to become one of the world's top shipping lines. In terms of the number of container boats it operates and the capacity of container slots, it identifys its position as the first-largest carrier in 2024 as it surpassed Maersk in 2022.

To mitigate overcapacity, MSC has adjusted its service offerings. For instance, in 2016, MSC redeployed large vessels from the Asia-North Europe route to the Europe-Middle East-South Asia trade, where demand remained relatively robust. This strategy helped align capacity with demand and optimize fleet utilization.

In response to market conditions, MSC has been scrapping older vessels. For example, in 2023, MSC sold the 1986-built MSC Floriana for recycling, marking its first ship disposal in nearly four years. This action reflects MSC's approach to managing fleet capacity amidst fluctuating market demands.

MSC's participation in the 2M alliance with Maersk allowed for shared services and resource optimization. However, with the dissolution of the 2M alliance in 2025, MSC is focusing on direct services and expanding its network independently.

### **6.3 Ocean Alliance**

A quarter of the world's container shipping capacity is handled by the OCEAN Alliance, which is made up of the shipping companies COSCO, CMA CGM, Evergreen, and OOCL. Collaboration on shipping routes between the US and other foreign locations is made easier by this agreement. It permits the sharing of confidential company data, which, unless contested in court, may offer protection from US antitrust laws. China Shipping and COSCO combined in 2016 to form COSCO SHIPPING. They joined the Ocean Alliance to improve service quality and reduce costs because of market challenges. COSCO SHIPPING, CMA CGM, Evergreen Shipping, and Orient Overseas are all members of the alliance.

Their global market shares at the time were:

- CMA CGM: 11.0%
- COSCO SHIPPING: 8.3%
- Evergreen: 4.9%
- OOCL: 3.3%

These companies were all in the second tier of global shipping, and their sizes were fairly close.

In 2018, COSCO successfully bought OOCL. OOCL maintained its unique brand identification and continues to be listed separately even after joining COSCO. After this merger, COSCO and OOCL's combined market share increased to 12.4%, above CMA CGM's 11.8%. As a result, COSCO became the third-largest container transport firm in the world at that time, only 0.2% behind its next rival (Zhao, 2021).

COSCO SHIPPING and its three alliance partners engage in collaboration through several key mechanisms:

- **Space rental:** The four shipping companies lease container slots from one another and compensate for this rental under their alliance agreement. This arrangement allows each company to offer more flexible
- **Slot exchange:** While maintaining their routes, the companies will exchange container space based on the terms of the alliance agreement.
- **Run joint ship:** The four companies have established agreements for joint dispatch operations across various routes, detailing the schedule, ports of call, and the number of vessels each member will deploy. Although they operate routes collaboratively, each member independently manages its route marketing.
- **Common share for port yard:** In line with the alliance agreement, the four shipping companies are permitted to share port yard facilities, which helps to lower costs and enhance operational efficiency.

The agreement established by the Ocean Alliance specifies that upon the commencement of their collaborative efforts, approximately 333 container vessels will be deployed, collectively offering a capacity of 4.1 million TEUs. The network of the alliance includes 41 routes.

- ✓ 20 routes in the Pacific region,
- ✓ 6 routes between Asia and Northwest Europe,
- ✓ 5 routes to the Mediterranean from Asia,
- ✓ 3 routes in the Atlantic,
- ✓ 5 routes from the Far East to the Persian Gulf,
- ✓ 2 routes from the Far East to the Red Sea.



The Ocean Alliance members can offer more frequent sailings, a wider vary of ports and finally more flexible service schedules. This helps customers get faster, more reliable service without needing each company to own ships for every route. Also, through joint ship deployment, shared terminals, and operational coordination, Ocean Alliance members can cut costs, save fuel, and operate more efficiently, offering market stability.

## 6.4 Market concentration of the two major shipping alliances

Below is an analysis (Zhao, 2021; Li, 2024) that compares 2M Alliance and Ocean Alliance, while both were still active, regarding their market share and the effect on market concentration. This will mirror the structure and approach of your original analysis, using market share, concentration ratios, and the HHI (Herfindahl-Hirschman Index) to understand the impact of each alliance on the container liner shipping market.

Table 6-2: 2M Alliance and Ocean Alliance Comparison

Alliance	Major Members	Combined Market Share (%)
2M	Maersk + MSC	~33.6%
Ocean Alliance	CMA CGM + COSCO + Evergreen + OOCL	~30%

So together, 2M and Ocean Alliance controlled roughly 63.6% of the global container shipping market during this period.

### Herfindahl-Hirschman Index (HHI) Calculation

The HHI is calculated as:

$$HHI = \sum_{i=1}^n S_i^2$$

Where  $S_i$  is the market share of company or alliance  $I$ , expressed as a decimal.

Let's take the three major alliances during the period:



- 2M: 33.6% → 0.336
- Ocean Alliance: 30% → 0.300
- THE Alliance (Hapag-Lloyd, ONE, Yang Ming): ~15.3% → 0.153
- Others (non-aligned): ~21.1% → 0.211

$$HHI_{alliances} = 0.336^2 + 0.300^2 + 0.153^2 + 0.211^2 = 0.1129 + 0.09 + 0.0234 + 0.0445 = 0.2708$$

**HHI = 0.2708** from alliance perspective (when all three alliances existed).

If we only consider **2M** and **Ocean Alliance** (excluding THE and non-aligned):

$$HHI_{2M+Ocean} = 0.336^2 + 0.300^2 = 0.1129 + 0.09 = 0.2029$$

So, if the world market was only composed of these two alliances, the HHI would still reflect a moderately concentrated market, but less so than when all three alliances are included.

- The HHI value of 0.2708 (when including all three alliances and the rest) suggests a moderately high level of market concentration.
- The HHI increases significantly when the market is viewed through the lens of alliances, compared to looking at individual shipping lines.
- If comparing only 2M vs. Ocean Alliance, the market still shows signs of oligopolistic behavior, with two dominant forces controlling over 60% of capacity.
- 2M alone accounted for a larger share than Ocean Alliance, indicating it had more influence in rate-setting and service offerings.

The comparative analysis of 2M vs. Ocean Alliance during their active years shows:

- The two alliances were dominant forces in the global liner shipping industry.
- Market concentration was elevated due to the strategic consolidation of capacity within these alliances.
- The HHI increases notably when alliances are analyzed collectively rather than by individual companies, confirming that alliances amplify market power.

- 2M, with its slightly higher market share, likely had a marginally stronger influence compared to Ocean Alliance.

## **7. Methodology approach**

In order to draw useful conclusions, the application of a specific methodology is necessary. For this reason, in the context of answering the research questions that were raised, a specific methodology will be applied, from which it is expected to extract the derived results. From the literal review presented in the previous chapters, all the components that are relevant to the objectives of the methodology will be captured and then evaluated critically.

The analyses that are going to be applied are the PESTEL analysis and the SWOT analysis. In combination, the two analyses will function complementarily, in order to obtain the maximum possible results that the bibliography gives. A presentation of the objectives that each analysis expects to achieve is presented below, as well as a brief reference of each analysis.

### **7.1 PESTEL analysis**

The PESTEL analysis—standing for Political, Economic, Social, Technological, Environmental and Legal elements — is a commonly utilized strategic planning tool that assists organizations in comprehending the external macro – environmental influences impacting their activities. Through a thorough assessment of these six areas, decision-makers can predict variations, recognize risks, and discover opportunities. Initially created in the realm of business and management, PESTEL has subsequently proven useful in public policy, healthcare, education, and environmental planning (Yüksel, 2012). The methodology highlights many factors as advantages, examines, uses, the origins, framework and drawbacks.

According to the theoretical foundation PESTEL is rooted in environmental theory, which states that external environments shape organizational behavior and strategy (Aguilar, 1967). Users are able to categorize and analyze external forces that are typically outside an organization's control but the strategic implications are really significant (Johnson, Scholes, & Whittington, 2008). The acronym derives from earlier versions like PEST and

PESTLE, but later includes Environmental and Legal factors reflecting growing concerns with sustainability and change in regulation (Gupta, 2013).

Analyzing each component of the PESTEL framework separately, a specific dimension is drawn:

- **Political:** Government policies, trade restrictions, political stability and finally tax regulations.
- **Economic:** Interest rates, exchange rates, inflation, economic growth methods.
- **Social:** Demographic data, cultural norms, education levels information, living points of view.
- **Technological:** Innovations, research directions, development activity, technological infrastructure.
- **Environmental:** Climate change, sustainability regulations, concerns about environment.
- **Legal:** Employment laws, health and safety legislation, consumer protection.

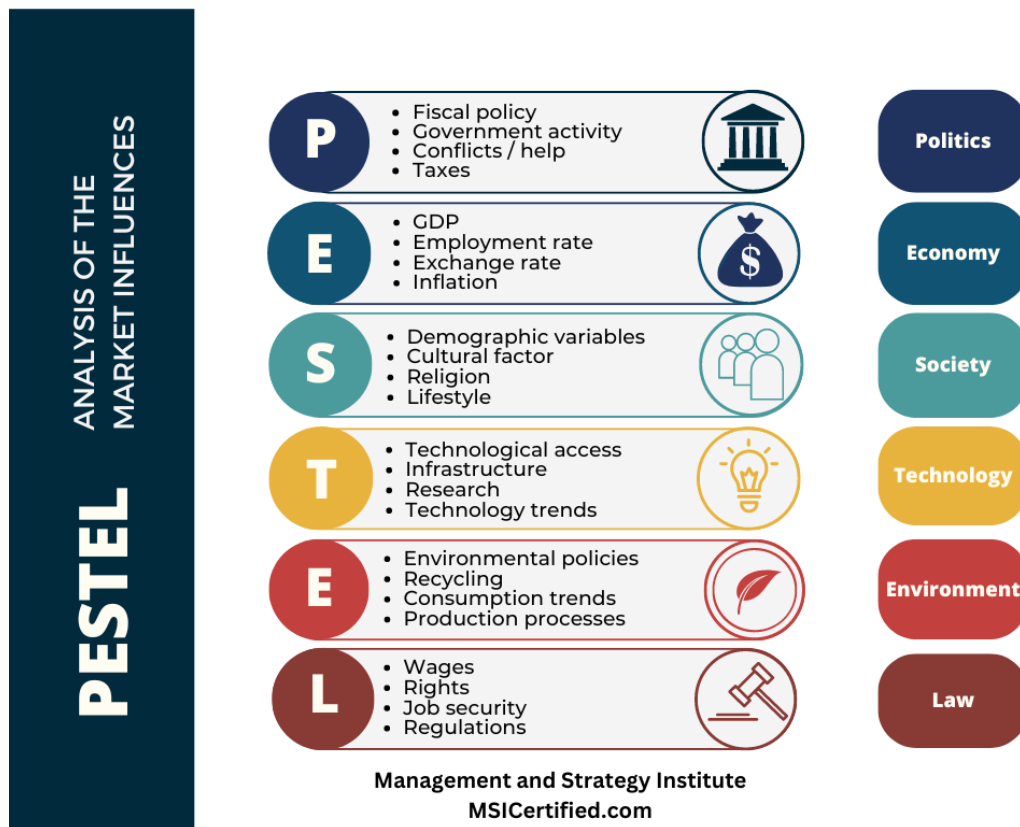


Figure 7-1: Pestel Analysis

A methodological approach of PESTEL analysis, include some steps that are involved in the process. The scanning of the **environment** frame: Collect data relevant to each of the six categories, often through desk research, expert consultation, or horizon scanning. Then, **identify factors** that drivers and trends within each PESTEL category that may influence the subject of the analysis. **Impact assessment:** Evaluate how each factor may affect organizational goals or outcomes of the project. And finally, **strategic implications:** Draw conclusions about risks, opportunities, and how may occur strategic alignment or change.

The holistic approach of PESTEL analysis, makes it particularly useful for strategic foresight and long-term planning. There are few fields of application according to the disciplines of this analysis such as **Healthcare** (for legal understanding, social, and economic influences on healthcare models (Cadle, Paul, & Turner, 2010)). **Environmental Studies** (so as to assess the interaction between environmental policies and economic growth (Rastogi & Trivedi, 2016)). **Public Policy:** To analyze the feasibility of new regulations or programs in light of social and political climates (Narayanan & Fahey,

2001). **Business and Management:** To support market entry strategies, product development, and risk assessment (Henry, 2008).

The basic strengths of the PESTEL methodology, which were the main reason for choosing this specific methodology, are presented below.

1. The six dimension field that PESTEL covers, ensures that multiple external factors are considered in strategic decision-making (**Wide Scope**)
2. Take into account future perspectives, foresight and proactive thinking by identifying trends that may not yet be impacting operations directly. (**Future-Oriented**)
3. The framework can be adapted or expanded (by adding Ethical or Demographic points) to suit the context of the analysis (**Adaptability**) (FME, 2022).

On the other hand, although PESTEL is widely used, PESTEL has several limitations. One of the most crucial is its **descriptive nature**. It identifies external factors but does not prescribe how to overwhelm. Additionally, **subjectivity** can affect the selection and explanation of the factors, leading to misleading or incomplete analyses (Gupta, 2013). The framework also **lacks prioritization**, making it difficult to assess which factors are most critical without further tools or scoring mechanisms. To mitigate these limitations, some recommend integrating PESTEL with quantitative tools like the Analytic Hierarchy Process (AHP) or employing scoring systems to prioritize issues (Perera, 2020). In the context of this specific research, the lack of quantitative comparable data made the use of quantitative methods impractical.

The PESTEL framework continues to be an important tool in environmental analysis and strategic development. Its capacity to provide a systematic overview of the macro-environment renders it a vital resource for both private and public sector entities. Although it has its drawbacks—mainly its subjective and qualitative aspects — its efficacy improves when combined with other analytical frameworks. Within this dissertation, PESTEL will be utilized to assess the external environment pertinent to [insert your research topic], providing an organized framework to comprehend the wider dynamics involved.

## 7.2 SWOT analysis

The SWOT framework is a strategic planning tool widely used in business, management, and organizational studies (Gürel & Tat, 2017). The SWOT analysis, which stands for Strengths, Weaknesses, Opportunities, and Threats, is a fundamental instrument in decision-making and strategic planning. Initially created for business analysis during the 1960s and 70s (Hill & Westbrook, 1997), SWOT has now been utilized in various fields such as education, healthcare, and public policy. Below we will examine the theoretical foundations, practical uses, advantages and limitations of the SWOT approach.

SWOT analysis is typically used to assess an organization or project's internal and external environments. Internally, strengths and weaknesses refer to attributes inherent to the entity being analyzed, such as resources, competencies, or organizational structure. Externally, opportunities and threats involve environmental or market factors that influence strategic choices (Ghazinoory, Abdi, & Azadegan-Mehr, 2011).

The primary goal of SWOT is to align internal capabilities with external possibilities in a way that maximizes success and minimizes risk (Dyson, 2004). It provides a structured framework for identifying factors that can help or hinder goal achievement and is often used during early stages of planning to inform strategic direction.

While the approach is qualitative, it may be supplemented with quantitative tools such as scoring or weighting factors (Pickton & Wright, 1998) to increase analytical depth, but as we for PESTEL analysis, in the context of this specific research, the lack of quantitative comparable data made the use of quantitative methods impractical.

Its flexibility and ease of use make SWOT especially popular in multidisciplinary and participatory research environments. SWOT analysis can be applied in various sectors as **Business and Marketing** (so as to evaluate product positioning, competitive advantage, and market expansion (Panagiotou, 2003)). **Healthcare** (in strategic health planning and policy development (Helms & Nixon, 2010)). **Sustainability and Environment** (for evaluating environmental policies and local development initiatives (Chermack & Kasshanna, 2007)). **Education** (to assess institutional strengths and improve curriculum design (Gurel & Tat, 2017)).

The SWOT analysis consists of four distinct stages:

**Identify Internal Strengths and Weaknesses:** These may encompass elements like human resources, financial stability, technological capabilities, and brand image.

**Examination of External Opportunities and Threats:** Market trends, economic changes, regulatory developments, and competitor behavior are evaluated here.

**Matrix Development:** The four elements are organized in a 2x2 matrix to enhance visualization and strategic alignment. The findings were organized into a SWOT matrix, visually displaying internal and external factors affecting the subject.

**Strategy Development:** According to the matrix, four types of strategies can be created: SO (utilizing strengths to exploit opportunities), WO (overcoming weaknesses by capitalizing on opportunities), ST (applying strengths to avoid threats), and WT (minimizing weaknesses to mitigate threats).



Figure 7-2: Swot Analysis

The SWOT analysis yields some very important advantages, like:

- **Simplicity and Clarity:** SWOT is straightforward to comprehend and apply, which encourages wide participation and stakeholder engagement (Valentin, 2001).



- **Strategic Focus:** It offers an organized method for strategic contemplation and encourages discussions on crucial elements impacting performance.
- **Flexibility:** Relevant in both organizational and project-based settings across various sectors and sizes.

Despite its popularity, SWOT faces some criticism. A major drawback and limitation is its **subjectivity**; the analysis's quality is highly dependent on the knowledge and perspectives of the individual performing it (Hill & Westbrook, 1997). Another issue is **lack of prioritization**, as SWOT does not inherently evaluate the significance and importance of items or recommend actions on them. Furthermore, it **overlooks the dynamic interactions** between variables and may simplify complex situations.

To overcome these limitations, scholars have suggested hybrid methodologies, such as combining SWOT with other tools such as PESTLE analysis, TOWS matrix, or the Analytic Hierarchy Process (AHP) to improve decision-making rigor (Shinno et al., 2006).

SWOT analysis remains to be an essential tool for strategic evaluation, providing an organized, adaptable and flexible method to comprehending internal and external factors influencing an organization or project. Although it has restrictions - mainly its qualitative aspect and reliance on the expertise of users - it can be significantly improved by integration it with complementary approaches. As this dissertation will further examine SWOT factions as a basis for strategic planning and is especially beneficial in participatory and interdisciplinary contexts.

Combination of PESTEL and SWOT analyses maximizes the findings that can be evaluate for safe and useful conclusions. Unlike tools such as SWOT, PESTEL focuses solely on external macro-level factors and is typically used as an input into broader strategic planning processes (FME, 2022). PESTEL is especially valuable when used in combination with other strategic tools, such as SWOT or scenario planning, to create a fuller picture of the strategic landscape.

## 8. Empirical / experimental findings

The issue of overcapacity in the container shipping industry is strongly connected with very important decisions taken by the shipping alliances. The 2M Alliance has mostly focused on increasing profitability by sharing ships and planning routes together. But MSC effort to adopt larger ships has led to more space than needed, causing freight prices to fluctuate.

Meanwhile, the Ocean Alliance—CMA CGM, COSCO, Evergreen, and OOCL—has added even more ships, especially because COSCO and Evergreen have grown their fleets capacity. By using larger ships can help lower costs. On the contrary, this can lead to financial risk if the market slows down.

The alliances are handling these challenges in different ways. Maersk is now trying to move beyond the usual shipping model and focus more on full logistics services. On the other hand, the Ocean Alliance is still trying to grow bigger, even though having too many ships may no longer be as useful as it once was.

### 8.1 PESTEL Analysis

Below, we will use PESTEL analysis to compare the 2M Alliance and the Ocean Alliance regarding the issue of overcapacity in the container shipping industry.

Table 8-1: Political issues

POLITICAL	
2M Alliance	<ul style="list-style-type: none"><li>• The 2M Alliance mainly operates along big trade routes between the East and West, so it depends a lot on things staying politically stable in Europe and North America.</li><li>• If there are issues between the EU and countries like China or the U.S., it could lead to stricter rules or make it harder to access certain ports.</li><li>• Because Maersk is based in Europe, it especially needs to pay</li></ul>

	attention to the EU's strict competition rules.
<b>Ocean Alliance</b>	<ul style="list-style-type: none"> <li>• China plays a significant role in supporting the company, since COSCO is owned by the government.</li> <li>• That government support might help it stay stronger at ports in the Asia-Pacific region.</li> <li>• Political conflicts, like the trade war between the U.S. and China, could affect COSCO and OOCL more than others.</li> </ul>

Table 8-2: Economical issues

<b>ECONOMIC</b>	
<b>2M Alliance</b>	<ul style="list-style-type: none"> <li>• The group is focused on making profits and improving how their shipping network runs, but MSC's rapid growth in ships is leading to too many vessels.</li> <li>• Maersk is moving more into full-service logistics, which is changing how the group works together.</li> <li>• Both MAERSK and MSC have added very large container ships, which has made the problem of overcapacity even worse.</li> <li>• Reduced capital investment on container vessels</li> </ul>
<b>Ocean Alliance</b>	<ul style="list-style-type: none"> <li>• Companies like COSCO and Evergreen are quickly growing their fleets too, which makes worse the problem of overcapacity.</li> <li>• This could help keep prices low, but it also means they're more at risk if the economy in Asia slows down.</li> <li>• Freight prices go up and down for everyone, but the Ocean Alliance might handle it better by saving costs through larger operations</li> <li>• All companies in Ocean Alliance have added very large container ships, which has made the problem of overcapacity even worse.</li> </ul>

Table 8-3: Social issues

SOCIAL	
2M Alliance	<ul style="list-style-type: none"> <li>• Maersk focuses on being environmentally responsible, treating workers fairly, and meeting European ESG (Environmental, Social, and Governance) rules.</li> <li>• However, how workers are treated at European ports might create conflicts with labor unions.</li> </ul>
Ocean Alliance	<ul style="list-style-type: none"> <li>• Since COSCO, Evergreen, and CMA CGM works with companies from many countries, the standards for labor can vary a lot.</li> <li>• This could lead to backlash, especially regarding working conditions in some Asian ports.</li> </ul>

Table 8-4: Technological issues

TECHNOLOGICAL	
2M Alliance	<ul style="list-style-type: none"> <li>• Maersk is ahead when it comes to using advanced technology like blockchain, tracking systems, and IoT.</li> <li>• MSC isn't as focused on tech but is putting money into greener, more efficient ships.</li> </ul>
Ocean Alliance	<ul style="list-style-type: none"> <li>• COSCO has been slower to adopt new tech but is making progress thanks to support from the government.</li> <li>• Overall, the use of technology varies a lot across companies, mainly because they're made up of different partners with different approaches.</li> </ul>

Table 8-5: Environmental issues

ENVIRONMENTAL	
<b>2M Alliance</b>	<ul style="list-style-type: none"> <li>• Maersk is taking the lead in cutting carbon emissions and aims to reach net-zero by 2040.</li> <li>• It's putting money into ships that run on methanol and building eco-friendly shipping routes.</li> </ul>
<b>Ocean Alliance</b>	<ul style="list-style-type: none"> <li>• COSCO and Evergreen are moving more slowly but are under pressure to meet global climate targets set by the IMO.</li> <li>• CMA CGM is also making progress by using ships powered by LNG (liquefied natural gas).</li> </ul>

Table 8-6: Legal issues

LEGAL	
<b>2M Alliance</b>	<ul style="list-style-type: none"> <li>• Maersk is under tighter watch for antitrust issues, especially as it winds down the 2M alliance in 2025.</li> <li>• It also has to follow tougher maritime rules set by the EU.</li> </ul>
<b>Ocean Alliance</b>	<ul style="list-style-type: none"> <li>• For now, it still benefits from certain competition law exemptions.</li> <li>• On the other hand, COSCO follows Chinese regulations, which might offer more flexibility but are generally less open or transparent.</li> </ul>

Table 8-7: Matrix of PESTEL analysis

PESTEL Factor	2M Alliance (Maersk + MSC)	Ocean Alliance (CMA CGM, COSCO, Evergreen, OOCL)
<b>Political</b>	Maersk is closely watched by regulators in Europe and the U.S. and must follow strict antitrust rules	COSCO operates with more support from the Chinese government and faces less public scrutiny
<b>Economic</b>	MSC's massive fleet may lead to too much shipping supply, while Maersk is moving more into logistics services	COSCO and Evergreen are growing quickly too, which could also add to the oversupply problem
<b>Social</b>	Maersk follows strict European labor laws and is more committed to environmental and social standards	COSCO and Evergreen have different labor practices and less consistent sustainability efforts
<b>Technological</b>	Maersk is ahead in using digital tools and technology. MSC is improving	COSCO is putting money into innovation but still lags behind Maersk
<b>Environmental</b>	Maersk is leading efforts to cut emissions with methanol-powered ships. MSC is focusing on better fuel use.	CMA CGM is betting on LNG, while COSCO and Evergreen are slower to adopt cleaner technologies.
<b>Legal</b>	Maersk deals with tougher rules in Europe and the upcoming end of its 2M alliance with MSC	COSCO and others work under more flexible systems, especially in China and other regions.

## **8.2 Strategies for Managing Overcapacity**

According to Ghorbani et al. (2022), shipping alliances **2M and OCEAN Alliance** cooperate to handle and improve the use of their ships and avoid problems caused by having too many vessels on the same routes. Below it is presented how this collaboration works in shipping industry.

- **Sharing Ship Space**

Instead of each company sending its own ship on the same route, they load their containers onto one shared ship. This cuts down on the number of ships needed, but deliveries still happen on schedule.

- **Coordinating Routes**

They work together to plan routes and decide which ports to visit. This way, they don't all send ships to the same places, avoiding wasted trips and keeping things efficient.

- **Responding to Cargo Demand**

When there isn't much cargo to move, they can cancel some sailings or pause using certain ships. This helps avoid having too much space and keeps shipping prices steady.

- **Sharing Ports and Equipment**

They use the same docks, cranes, and port facilities. In order to run operations smoothly, they collaborate each other leading to cost reduction and higher loading speed.

- **Using Larger, Eco-Friendly Ships**

By teaming up, they can fill bigger ships that are more fuel-efficient and better for the environment.

- **Using Tech**

They use shared digital tools to track shipments, plan better, and avoid delays. It helps them stay organized and make faster, smarter decisions.

### 8.3 SWOT Analysis: 2M Alliance vs OCEAN Alliance

As global shipping alliances have become the norm, the shipping industry is now more concentrated than ever. Big companies team up, making it harder for smaller ones to survive on their own. In this situation, joining an alliance—like COSCO did with the Ocean Alliance—is almost necessary to stay competitive. Below, it is presented the SWOT ANALYSIS comparing the strategies between 2M Alliance and Ocean Alliance

Table 8-8: Matrix of SWOT analysis

Category	2M Alliance (Maersk + MSC)	OCEAN Alliance (CMA CGM, COSCO, Evergreen)
<b>Strengths</b>	<ul style="list-style-type: none"> <li>• Maersk and MSC are two of the biggest shipping companies in the world.</li> <li>• They have strong global routes and coverage.</li> <li>• Maersk leads in green shipping and digital tools, while MSC has the largest fleet.</li> <li>• Maersk also uses advanced tech to track containers and improve efficiency</li> </ul>	<ul style="list-style-type: none"> <li>• Together, they have a large capacity and strong presence in key markets like Asia, Europe, and the Americas.</li> <li>• COSCO benefits from support by the Chinese government.</li> <li>• CMA CGM is a leader in using LNG-powered ships.</li> <li>• They also have good access to major Asian ports.</li> </ul>
<b>Weaknesses</b>	<ul style="list-style-type: none"> <li>• The alliance is about to end, which creates uncertainty.</li> <li>• Maersk and MSC have different business strategies—Maersk focuses more on logistics, while MSC focuses on growing its fleet.</li> <li>• They face strict rules and</li> </ul>	<ul style="list-style-type: none"> <li>• It's harder to manage because it includes more members.</li> <li>• Not all members are equally advanced in technology.</li> <li>• COSCO, in particular, faces criticism for lacking transparency in regulations and</li> </ul>



Category	2M Alliance (Maersk + MSC)	OCEAN Alliance (CMA CGM, COSCO, Evergreen)
	close monitoring from European regulators.	sustainability practice
<b>Opportunities</b>	<ul style="list-style-type: none"> <li>• Maersk is expanding into full-service logistics and pushing for cleaner shipping.</li> <li>• MSC is investing in growing its fleet and taking advantage of global trade recovery.</li> <li>• They are well-positioned to lead in green shipping routes and digital innovation.</li> </ul>	<ul style="list-style-type: none"> <li>• COSCO is backed by the Chinese government to expand globally.</li> <li>• The Asia-Europe shipping route continues to grow in demand.</li> <li>• There's room for the alliance to catch up in tech and sustainability efforts.</li> </ul>
<b>Threats</b>	<ul style="list-style-type: none"> <li>• After the alliance ends, both companies may face more regulatory challenges.</li> <li>• The industry is still dealing with unpredictable market conditions and too much shipping capacity.</li> <li>• Rising costs in Europe could affect profits.</li> </ul>	<ul style="list-style-type: none"> <li>• Tensions between countries, like the US and China, could create risks.</li> <li>• Stricter global environmental rules may require costly changes.</li> <li>• Once 2M ends, Maersk and MSC could become stronger competitors.</li> </ul>

## 9. Implementation Results and Discussion

The above analysis compares the Ocean Alliance (COSCO, CMA CGM, Evergreen, OOCL) to the 2M Alliance (Maersk & MSC), giving the following results for important areas of differentiation. The shipping alliance contributes to lower the costs and improve competitiveness. Becoming part of the shipping alliance can help mitigate risks for both large and small shipping companies entering the market. If a balance is achieved between opportunities and challenges, the shipping alliance environment will present a significant chance for shipping companies to thrive.

### 9.1 Conclusion

In terms of **Brand Power**, the Ocean Alliance has a strong presence in China and operates more efficiently in local markets. In contrast, the 2M Alliance has a strong global appeal in Europe and North America that is based on the longstanding reputations of Maersk and MSC.

The **Fleet Efficiency** of Ocean Alliance offers a new approach of using the same ships for both domestic and overseas shipping needs. This strategy improves operational flexibility and offers better fleet utilization. Meanwhile, 2M Alliance use larger and more diverse fleets, which operate in more traditional and well-structured shipping routes.

Regarding **Human Capital**, Ocean Alliance has strong national recruitment, especially in China, and emphasizes competitive internal development. On the other hand, 2M is globally diversified based on higher automation technologies and training systems.

When it comes to **Cost challenges**, the Ocean Alliance confronted significant financial difficulties as it had to comply with the **IMO 2020 regulation** and reduce the sulfur content in fuel from 3.5% to 0.5%. This forced the company to huge investments on upgrading its ships. On the contrary, 2M was in better position to manage the financial and operational impact of the **IMO 2020 sulfur emissions regulations**. The economies of scale gave the advantage to absorb this high cost more efficiently.

Regarding **Infrastructure** the Ocean Alliance is still in the process of modernizing and expanding China's port facilities to meet global standards and support competitive growth. In comparison, 2M has easier access to better-established global port infrastructure. Maersk and MSC enjoy the benefits of terminal ownership such as APM Terminals and Terminal Investment Limited (TIL).

Last but not least, regarding the **Political Environment**, the Ocean Alliance benefits from China's government support. However, this was not enough to protect this alliance from external political risks or trade tensions from other countries. On the other hand, the 2M alliance is less exposed to sanctions since it operates based on more neutral strategies. However, 2M is also influenced from external political risks.

Overall, shipping alliances are more than just companies working together—they're a way to rearrange how resources are used in the industry. At a deeper level, it's about balancing power and profits in a competitive market. As a result, shipping alliances have become a key area of interest and research for scholars today. This dissertation examines the shipping capacity and market share of the two major shipping alliances, the 2M Alliance and the Ocean Alliance, along with the route changes of jointed shipping companies before and after joining the alliance.

This dissertation looks at how the 2M Alliance and the Ocean Alliance compare in terms of shipping capacity, market share, and route adjustments made by member companies before and after joining the alliance. Based on a PESTEL analysis, the 2M Alliance appears that is better equipped to handle global challenges, thanks to its strong central management and through innovation efforts. On the other hand, the Ocean Alliance benefits from its large size and strong position in Asia, but is more vulnerable to political and economic instability, as well as internal coordination issues. These differences show that each alliance's ability to respond to outside pressures will play a big role in shaping their future success.

## **9.2 Future development forecast**

The worldwide container shipping industry is getting prepared for major changes after Maersk and Mediterranean Shipping Company announced they will end their 2M alliance. This alliance, which played a key role in stabilizing capacity and rates on important trade routes (Asia-Europe, Trans-Pacific, and Trans-Atlantic), had come to an end after its approximately 10 years period, with the two-year termination notice now officially activated.

The breakup indicates that both companies plan to follow their strategies:

- Maersk tries to concentrate in strategies for building the largest and most integrated logistics provider, apart from just container shipping line.
- MSC, now the largest container line in the world, tries to grow by gaining more control over its fleet and routes.

Industry experts and analysts have warned that this might lead to a further rate war similar to what happened in the early 2010s, especially due to weak global trade demand. Without having the option to consolidate capacity through partnerships, large shipping companies may find it hard to fill their vessels, which could result in significant drops in freight rates.

With the 2M alliance breaking apart, the two remaining major alliances in the industry — THE Alliance and Ocean Alliance — might experience pressure, potentially resulting in:

- New Vessel Sharing Agreements (VSAs) or changes to current ones
- Heightened competition, as carriers may try to capture market share on their own
- Ripple effects that alter global trade patterns and collaborations even with the uncertain future, many views this as a pivotal moment for the shipping industry's development, as traditional structures make way for new strategic directions and competitive dynamics.

Looking ahead, the industry faces more challenges. The container shipping industry is heading into a tough period. Too many ships, weakening profits, and long-term changes in trade patterns are setting the stage for more pain — and it doesn't look like the major players are planning to slow down anytime soon.

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