

Logistics and Maritime Transport Sector in the Pandemic Period

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Abstract: The purpose of this study is to express and deploy the issues which logistics and particularly the maritime shipping sector have faced during the COVID-19 pandemic and what solutions have been implemented specifically by the shipping companies on the matters. As a result of an extensive literature review along with self-gained professional sector knowledge, a list of serious issues indicates container shortage, freight rate fluctuations, and vessel quantity insufficiency are among the top challenges that shipping lines have to overcome. A significant amount of orders for new container manufacturing and vessel building have been placed. Additionally, in order to stabilize or even decrease the freight rates, shipping lines have formed alliances and working on alternative fuel consumptions to be implemented for environmental friendliness, better price options, and sustainability. However, studies indicate that new ordered containers and vessels would not come into the flow for the next 2–3 years. On the other hand, alternative fuel projects require acceptance and support from every member involved in the sector and its effect would be felt gradually over the upcoming years until 2050. The study suggests several incentives and encouraging recommendations. First, a monetary incentive toward early container returns for creating higher and faster container flow. Second, inviting governments and every member of the logistics and supply chain industry to be part of the investments rather than only having the shipping lines in the play.

Keywords: Logistics, Maritime Shipping, Transportation, Pandemic, COVID-19

JEL Classification: L91

1. Introduction

Throughout history, logistics was always a part of daily life. In the past, logistics was a narrower form of today's supply chain concept. It was covering only the planning and performing part of effective storage, distribution, and transportation of products from the origin point of supply to the final consumption point. The main purpose of logistics is to satisfy the needs of customers on time and with a cost-efficient aspect. There are mainly 5 valid modes of transport in logistics; (a) road, (b) air, (c) rail, (d) sea, and (e) pipeline. Companies choose the mode or modes (multimodal) of transport based on goods characteristics, weight or volume, and the final delivery destination.

Other possible elements which would affect the choice while selecting the best mode can be agreed incoterms, the urgency of the shipment, and of course the overall rate of the transportation itself.

Each mode of transportation has its own challenges, pros, and cons. However, some modes are more dominant and important for global trade than others. Maritime shipping carries 80–90% of international trade and it is accepted as the artery of the global economy (UNCTAD, 2021). On the side, road transportation can be considered capillaries in the body of logistics. According to European Commission (2022), road transportation carried the highest record figure of the past decade as 77.4% of the inland cargo shipping in the EU.

Air transportation is one of the other significant enablers in accomplishing economic expansion and improvement. It is critical for regional, national, and international connectivity. However, it is the most expensive among other transportation modes and has a limited capacity for certain groups of cargoes. On the other hand, rail transportation is much more cost-friendly on long distances but it is restricted by the rail infrastructures. Rail transportation is significant for integration, and improving and strengthening the agriculture industry of a nation.

Pipeline transportation of cargoes is a way of carriage in which only gases, solid, and liquid products can be moved through pipelines over long national or international distances. It requires expensive investments and maintenance and is mostly utilized for crude and refined petroleum commodities transportation.

Each of the stated modes of transport carries advantages and disadvantages when it comes to comparison of one to another. Table 1 demonstrates a comparison between modes of transport under categories such as door-to-door service option, capacity, speed, cost, reliability, risk, etc. Ocean transportation has the highest cargo capacity and the lowest freight rate based on the volume size among other modes. Contrary to maritime shipping, air transportation owns the lowest cargo capacity, which can only take certain types of goods, and the highest cost of carriage. Road transportation remains the only mode of transport that can provide the best door-to-door service experience. The railroad is limited only to rail infrastructure and is mostly utilized only for inland transportation of products. Among the transportation modes, pipelines can only carry liquids, solids, gases, crude, and refined petroleum. Even though pipeline transportation has a low environmental impact, in case of a disaster its effect would be greatly significant to the environment.

Table 1. Comparison of Transportation Modes

<i>Characteristics</i>	Rail	Road	Pipeline	Air	Sea
Capacity	High	Medium	Only Liquid/Gas*	Very Low	Very High
Cost	Low	High	Very Low	Very High	Very Low
Credibility	Medium	Medium	Very High	Very High	Low
Door-to-Door Service	Sometimes	Yes	Sometimes	No	Sometimes
Environmental Effect	Low	Medium	Low*	High	Low
Flexibility	Low	High	Very Low	Very Low	Low
Needs of Packaging	High	Medium	Nil	High	High
Risk of Loss/Damage	Medium	Medium	Very Low	Low	Medium
Speed	Slow	Medium	Slow	Very Fast	Very Slow

Source: Gourdin. K., Global Logistics Management, 2006. Retrieved from <https://www.futurelearn.com/info/courses/supply-chains/0/steps/23742>

Nevertheless, the COVID-19 pandemic had hit a heavy strike on the logistics and supply chain sector. All actors involved in the storage, distribution, transportation, and flow of products have been influenced by the global pandemic directly. Economic expansion, competitiveness, and international trade levels of companies and countries got affected and disrupted by the pandemic.

In this study, measures of impacts of the pandemic and implemented solutions by the actors in the logistics sector have been covered. However, maritime shipping covers a major part of this work since it directly affects international and worldwide trade and economic levels of the globe and world's countries which have joined access by the sea.

2. Literature Review

The impact of the COVID-19 pandemic on the logistics and maritime transport sector has been well researched. Research findings outline the industry received severe challenges and deep effects which have caused backlogs, bottlenecks, decrease in manufacturing levels, decline in transportation and shipping capacity, labor deficiency, and port congestion. For example, a study by IFC (International Finance Corporation) underlined how lockdowns limited truck drivers, canceled ocean shipments, affected overseas production operations, and influenced overall transportation modes in different ways (Twinn et al., 2020). Similar studies were also mirrored in an extensive paper by other numerous researchers and statistics institutions. However, researchers also focus on the taken actions by the players in the sector. Shipping companies formed alliances, placed record numbers of orders for new container manufacturing and newbuild vessels, invested in alternative fuel innovation, and applied incentives for smoothness and easy recovery from the effects of the pandemic (Notteboom et al., 2022; Boata et al., 2021). These recent studies have provided insights into how the

sector is vital yet fragile and further precautions against unforeseen events should be taken since the recovery process is no faster than getting the negative effects.

One limitation of previous studies is a focus on the importance of shipping companies and their actions in the sector for the benefit of the global market as well as the level of interaction of governments on investments and applied actions by the industry players. This proposes that researchers currently know relatively little about the various ways in which governments and major top industry players affect or can affect the direction of courses and the sector itself. If academicians and researchers desire a better understanding of individuals interested in or involved in the logistics and supply chain sector and elements related to the further success of the industry and country, then examining how significant roles governments and shipping companies carry or can carry is critical. For instance, future research could analyze how high-performing the industry may achieve service excellence, while governments and shipping companies collaborate closely. Such research could contribute to determining certain strategies and practices that narrate to the potent integration of parties in all kinds and successful operations in the logistics sector.

3. The Influence of Pandemic on Logistics

The effects of the pandemic were initially seen in China since it has a significant role in worldwide production. Despite being a crucial location in global manufacturing, China is also an important center for global goods and agricultural commodities consumption.

Production breakdown in China surged through the whole supply chain. All cargoes were accumulated at the leading Chinese container ports since containers could not be picked up by limited truck drivers because of lockdowns and following ocean sailings cancelations. This situation has also affected overseas production operations of major industries such as medical equipment, electronics, and pharmaceuticals. Even though production of major industries has now returned to its normal stage by 70%, a full global capacity recovery is improbable to be gained in any near term (Twinn et al., 2020).

Road transportation in China bears more than 80% of the carriage of goods in the country, which had experienced a dramatic 15% drop (lower than 2019) between January and February 2020. Nonetheless, a quick yet gradual recovery was achieved (see Figure 1) by containing the virus rapidly and the policy of the government regarding trucking (Twinn et al., 2020).



Figure 1. FTL Recovery Rate of China – 2020

(Source: IFC, The Impact of COVID-19 on Logistics, 2020)

After China, the contagious COVID-19 virus spread out to the rest of the globe, causing countries to close borders and implement lockdowns. Additional safety protocols for staff, such as social distance, were introduced, which led to having a limited number of professionals at a time at the workplace and contributed to bottlenecks for the goods. Due to the border closure in Poland with Germany, 60 km long truck lines formed on the A4 highway in the EU. In major Indian ports, above aggregated 50,000 containers stacked because of the truck driver shortage created by the lockdown of the country (Twinn et al., 2020).

3.1. Land Freight

Except for countries under heavy lockdowns, road haulage remained partly available with higher rates because of reduced employee presence, and combined with additional demand for transportation of food and medical supplies, its capacity actually was stressed. In some markets, spot rates of road freight had fallen since manufacturing levels were generally not at full capacity (Twinn et al., 2020).

3.2. Air Freight

Even though the volume of flights dropped by 19% in Q1 2020 due to a decline in production in China, rates of air freight had increased and some carriers were facing delays because of rising airport congestion since governments and consignors altered toward air cargo for compulsory products (Twinn et al., 2020).

3.3. Ocean Freight

Cargoes were backlogged and container handling volumes declined in Q1 2020 by 10% in ports of China (Twinn et al., 2020). This situation caused many containers to remain

stacked at Chinese ports and created a global equipment shortage. In addition to that, shipping companies applied blank sailings, which refer to the disengagement of some portion of transportation size from the main trade lanes, in order to set supply to demand (BIMCO, 2020). These circumstances constrained the worldwide ocean freight levels and fluctuated its rates, influencing key exporter (such as India and China) and importer (such as the EU) countries, even making some countries become net exporters or net importers due to trade imbalances and the natural estate of a country itself (Brancaccio et al., 2020).

3.4. Rail Freight

Due to the blank sailing of vessels, longer transit times of vehicles, and higher freight rates of air cargo as well as maritime shipping, railroad services expanded in demand during the pandemic (Twinn et al., 2020).

4. Adopted Practices Against Uncertainties

Big corporations in the sector like CEVA Logistics and DHL announced "Force Majeure" on all the contracts because of the pandemic. Force Majeure is a clause closely related to unforeseen situations and the Act of God, which empowers agreements to be notified null and void (Twinn et al., 2020).

During the crisis, governments have stepped up by appointing transportation, shipping, airports, and ports as mandatory services (logistics wise), therefore, free from lockdown precautions. Closer and further cooperation between 3PL (Third-Party Logistics) and governments has been needed and will be needed to facilitate bottlenecks in the supply chain and logistics sectors. Some of the adopted measures by companies against the uncertainties can be listed as; contemporary safety protocols for the health protection of staff, adjusting alternative transportation modes such as utilizing charter flights to carry cargoes, and complying services to valid customer demands like prioritizing or offering customized enhancements on specific shipments such as protective gears, medical materials, pharmaceuticals, grocery deliveries, and other essential last-mile delivery products (Twinn et al., 2020).

5. Maritime Transport in the Pandemic Period

The primary transportation mode in logistics and global trade is maritime transportation, which carries 80–90% of commodities and almost 70% of overall trade value globally (Brancaccio et al., 2020). This case generates opportunities as well as challenges to overcome.

Undoubtedly the year 2020 would be noted as the year of the COVID-19 pandemic in history. The pandemic has wounded the shipping industry deeply. Under tramps services, tankers and dry bulk carriers have faced declined demand and a series of challenges. In spite of difficulties, dry bulk carriers performed well in 2021 since China had intense demand for coal, ore, and iron. However, tankers, on the other hand, could not perform the same since the market had no interest in fossil fuels (BRS, 2021; SSY, 2021). Nonetheless, linear shipping services, also known as container shipping, could gain an overall record profit by Q4 2020 (Baker, 2021). The reason for this profit is that European and North American shippers ended up paying rates 5–10 times higher than what would normally have been paid since limited containers and vessels were available, each containership could carry a certain amount of cargo at a time, blank sailings, and backlogs on previous shipments caused further delays for the next deliveries and greater traffic congestions at ports. Although higher rates were being paid, shippers had to, in fact still have to, wait weeks to get a free container for loading and reserve a space on a vessel (Attinasi et al., 2021).

5.1. Issues and Implemented Actions

Even though the maritime industry is a significant element of the logistics sector and supply chain, despite offering substantial economic advantages with its large capacity of volume of freights, it faces great challenges to overcome.

Container shortage is one of the top challenges which began during the early pandemic days. Many containers, instead of floating, were kept in ports and inland storage plants due to lockdowns and restricted global shipping capacity which resulted in containers not being picked up. Since the salvage from the effects of the pandemic does not happen equally in every nation, as well as not having an even distribution of containers around the world, it has been forecasted by some professionals that the shortage could start to decrease in 2022 by the rise of new containers. However, disequilibrium in the market could not soon be solved since the manufacture of new containers require time and the ordered quantity would barely be enough to adjust the present imbalance. Market researchers do not expect a great increase in the container manufacturing industry over the next several years, addressing that supply probably will not solve the shortage soon (Newton, 2022). Recently, CMA CGM company had applied an ingenious practice to create higher container flow. The company announced that between 16 May and 15 July 2022 would pay a US\$300 incentive for containers that are delivered back to any of its US plants within 4 days after being picked up.

According to the French carrier, this program offered approximately 43,000 containers to be returned in the flow (Savvides, 2022).

Insufficient numbers of vessels is another top challenge that the shipping industry has to overcome. Maritime companies decreased the number of vessels during the pandemic in regard to declining demand and production downtrend. However, according to the post-pandemic and slow salvage period of the market, in order to decrease the intensity of port congestions, global order for new containerships, even though the shipping costs maintain high, has reached record peaks by 6.4% of the present fleet. Only in H1 2021, the largest record order of 1.7 million TEU (Twenty-Foot Equivalent Unit Containers) capacity of fleet was submitted. This number expresses a nearly 15% capacity growth yet the effects will not be seen until the newbuild vessels are delivered in the future 2–3 years (Boata et al., 2021). Shipping companies formed alliances (see Figure 2) to reshape their liner shipping networks. These collaborations and structures between shipping lines provided their members easy access to comparably lower service costs and allowed them to unite in many areas and share vessels, terminals, and equipment (Notteboom et al., 2022).

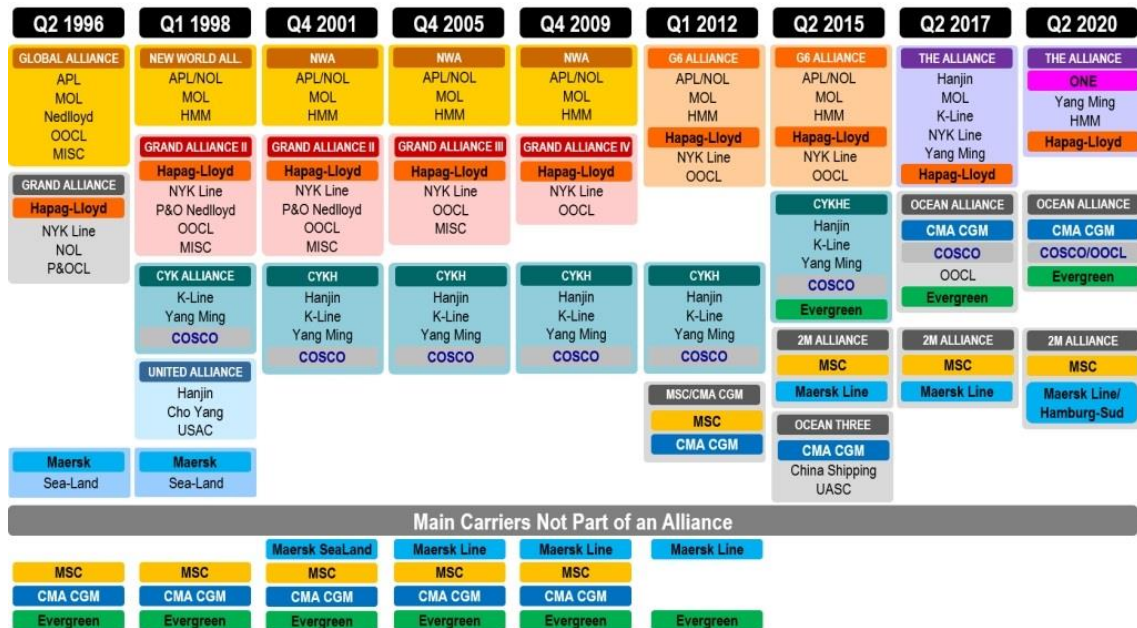


Figure 2. Alliance in Liner Shipping
(Source: Port Economics, Management and Policy, 2022)

According to Malaysian National Shippers' Council (2022), maritime freight rates have increased by 800% in some trade lanes due to decreased vessel capacity and container shortage joined with increased manufacturing costs and labor deficiency as a result of the COVID-19 pandemic. Shippers must everyday make hard decisions on whether not to transport and end up losing foreign markets or to accept the high charges of export. In addition to that, foreign importers have been pushed by the booming rates to delay orders. Both importers and exporters are losing revenues in ocean import/export operations (The Malaysian Reserve, 2022). Besides mentioned factors, other elements such as exclusive changes in the economic status of a critical country like a slowdown in China or an increase in oil/fuel prices would directly influence the shipping costs. Various organizations like FIATA (International Federation of Freight Forwarders Associations) and IMO (International Maritime Organization) and companies such as Hapag Lloyd and DHL have invested and constantly invite other parties in the industry and governments to be part of investments in decarbonization and alternative fuel innovation both for sustainability along with creating environmental friendliness and lowering shipping costs. For example, Hapag Lloyd will utilize developed biofuels for transporting DHL cargoes based on the agreement made between the two companies (Hapag-Lloyd AG, 2022).

6. Conclusion

Logistics is a vital element of the supply chain concept and forms a big part of daily life. Moreover, it is a crucial economic driver for the world's countries. Smoothness and continuity of logistics activities are vital for a country's national and international benefits. Each mode of transportation in the logistics sector has an important role for a nation based on the location, natural estate, and infrastructure of the country.

The primary mode of transport, engine of global trade, and the backbone of a country is maritime transport. It is the key to global connectivity, economic growth, and the development of a country.

Nonetheless, the logistic sector, and particularly maritime shipping, have to overcome challenges. Especially, after the hit of the pandemic, the transportation sector and supply chain received severe and deep effects. The sector faced backlogs, further bottlenecks, and labor deficiency. Also, production almost stopped in major countries of the world, and following that, the parties in the shipping industry had to make tough decisions against uncertainties such as applying blank sailings and decreasing fleet capacity. On top of that, uneven distribution of equipment around the globe was

experienced since the major ports in the world, mainly Chinese ports were shut down because of the pandemic.

Actors in the sector applied practices by placing a record number of orders both for new container manufacturing and vessel building. Additionally, the parties formed alliances to expand network access and share equipment among members for the assistance of the member parties and the smoothness of operations. Furthermore, some organizations and companies in the sector joined forces and invested in alternative fuel innovation for lowering the cost and generating sustainability as well as environmental friendliness.

In the meantime, governments were getting involved only in the policy and regulation adjustments of the logistics sector of the country.

The logistics and maritime transport sector will recover and overcome the challenges not only for itself but also for the continuity of life. The shipping companies own a big share in the recovery period. However, the impacts of applied practices will not soon be felt until the future 2–3 years. In addition, the sector and all involved actors of it should be prepared for any future unexpected or unforeseen challenges or issues.

7. Recommendations

This study presents the recommendations below:

1. Governments should get more involved in the practice, being part of investments, alliances, and incentives rather than just amending the policies and regulations. This is critical since post-pandemic recovery duration would get sped up.
2. Companies should provide more often and longer incentives for generating a continuous and higher flow of the equipment in the sector. This would ease the industry at a certain level until new vessels and containers arrive at the market.
3. All major top players in the sector should join forces and be part of alliances and adopt alternative fuels in consumption for end-to-end balanced operation, sustainability, and environmental friendliness.

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