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The attached educational project, by Grayson Capps, entitled A.P. Moller–Maersk: Navigating the Waters During the COVID-19 Virus, when completed, is to be submitted to the Graduate Faculty of the University of Wisconsin-Platteville in partial fulfillment of the requirements for the (MASTER OF SCIENCE IN INTEGRATED SUPPLY CHAIN MANAGEMENT) degree.

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Navigating the Waters of COVID-19

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MASTER OF SCIENCE IN INTEGRATED SUPPLY CHAIN MANAGEMENT

By

Grayson Capps

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Abstract

The global COVID-19 pandemic forced governments and businesses to re-evaluate their global supply chain strategies. International trade depends on the operation of critical resources across the supply chain. Any operational impact on the resources would further weaken economies while causing increasing ripple effects up and down the supply chain. With COVID-19 impacting the labor force, ocean freight companies faced unforeseen and uncontrollable obstacles. From capacity issues due to equipment and labor shortages to the increasing freight rates, these obstacles added strain to international trade and global economies. Enter A.P. Moller – Maersk, the world's largest container shipping company by volume. The following research will focus on the challenges presented by COVID-19 and how Maersk overcame them to post record revenue and operational efficiency.

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Introduction

In recent years, the term "shortage" has elicited a different response compared to its use during decades prior. The outbreak of the COVID-19 pandemic has had a significant impact on global shipping. Many countries have responded to the pandemic by imposing a lockdown or restriction of movements. (Wan et al., 2021) Restrictive actions, as well as consumer shifts, levied an extreme amount of stress upon the global supply chain. Due to the complexity of the supply chain, any disruption in the supply chain link causes a domino effect, leading to an increase in prices and a shortage of raw materials and other necessary inputs. (*Industry Outlook 2022: Awaiting Normalcy of the Supply Chain*, 2022)

One central principle of the global supply chain and international trade relates to the principles in the Law of Supply and Demand. Fundamentally, the Law of Supply and Demand is the relationship between buyers and sellers. This relationship directly relates to the buyer's wants and needs, or demand, and the ability of suppliers to fulfill it. (*What Is Law of Supply Demand? Definition of Law of Supply Demand, Law of Supply Demand Meaning - the Economic Times*, n.d.) During the pandemic, the market for goods shifted, and specific categories experienced increasing prioritization. This prioritization of goods, like safety and cleaning supplies, increased overall demand in these categories. The increase in demand caused a need for suppliers to increase production. However, with government restrictions and global supply chain challenges, it became difficult for suppliers to keep up with the demand, contributing to the "shortage" of prioritized goods.

The ocean freight industry is central to the global supply chain and international trade. As a critical trade component, the industry's performance is essential to suppliers' ability to satisfy demand. Any delay in the process will be magnified across the supply chain, creating

unforeseen challenges for suppliers. The responsibility to mitigate the impact of COVID-19 fell upon the local governments. However, governments' actions multiplied the challenges plaguing international trade and, more specifically, the ocean freight industry.

Statement of the problem

Globally, more than **\$4 trillion** in goods ship across all transportation modes annually, and the ocean shipping industry carries 80% of the goods consumers use daily. (Hampstead, 2019) Experts opine that in the maritime sector, the pandemic has caused a questioning of the global supply chain originating on one continent and terminating in another. Far-reaching and longer global supply chains are susceptible to disruptions. The three leading logistics disruptions the maritime industry faces include shortages of containers and equipment, unavailable space on ships, and skyrocketing freight costs. (Wan et al., 2021)

A.P. Moller-Maersk, referenced as Maersk throughout this paper, is one of the world's largest ocean container shippers by volume. This paper aims to detail the impact of the pandemic on the ocean freight industry and the outlook for this sector by explicitly focusing on Maersk. For an industry and organization that is a significant and critical component of the global supply chain, there is a need to understand the obstacles presented and the actions taken by Maersk to minimize the impact of the pandemic. Gathering and presenting this research will illustrate the environment in which Maersk operated and the challenges that arose for supply chains during the pandemic. Since a pandemic on the scale of COVID-19 has never occurred, it is crucial for the maritime industry's future and the global supply chain to research and understand its impact.

The research and data presented in this paper will start during the year 2019 and continue to the present day. The state of the ocean freight industry during the pandemic and post-pandemic can be conceptualized by narrowing the data to a defined period from 2019 to the

present day. Restricting the data to this period allows the readers to understand the evolution of the global supply chain and ocean container shipping through the pandemic.

Purpose of the Study

The primary focus of this study is to detail, digest, and then illustrate the immediate impacts of a global pandemic on the maritime industry by focusing on a top performer in the industry. Not only will the maritime industry's state be scrutinized during the pandemic, but also the industry's learnings and future. Successful illustration will occur by using Maersk as the primary focus. This academic piece will present information on the location of multiple pressure points applied upon Maersk, including the immediate obstacles faced and the subsequent periods. Interwoven into the daily fabric of international trade and the global supply chain, one can assume that challenges faced by Maersk existed across large amounts of supply chains and industries.

Secondarily, this paper desires to provide information to its readers and to be used by organizations to embrace challenges with innovative thoughts and ideals. Embracing new ideas begins with an analysis and understanding of the problems faced. Mastery of the issues will lead to more profound knowledge and insight into the development of contemporary theories and processes along the supply chain. The future evolution of the global supply chain will hinge upon the development of unique concepts and rationalizations. The growth of future ideas will be like the aftermath of COVID-19, in which organizations prioritize supply chains with a high resiliency to outside influence and increased tolerance levels. In addition to high resilience and increased tolerance, there will be a renewed focus on customizable supply chains through providers and their offerings.

Only some new ideas will be applicable on a global level as there will be ideas that are industry-specific or situationally specific. However, COVID-19 has forever changed the global

supply chain and the execution of international trade. Organizations focus shifts upon long-term resilience in their business model and operational strategies. Companies that increase operational efficiency and execute informed decisions will increase customer satisfaction. (Wan et al., 2021) For organizations like Maersk and the ocean freight industry, the actions of the most significant eight ocean carriers, who control over 80% of capacity, will determine the industry's future. (Thuermer, 2022)

Literature Review

Historical Performance

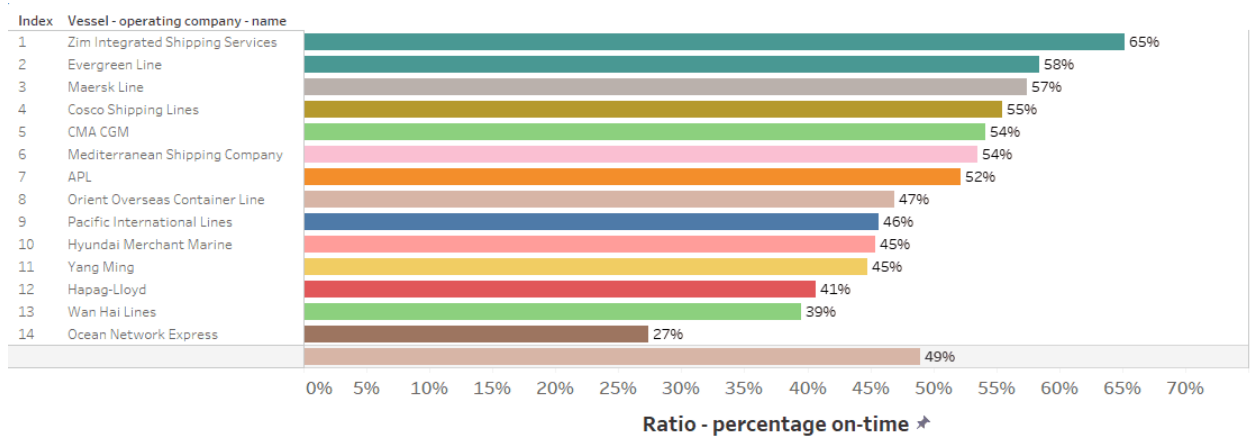
During the 1950s, the invention of the modern shipping container helped revolutionize international commerce. (Pooler & Hale, 2020) No longer would shipping companies have to deal with issues of loose and variable-sized freight. Instead, creating and using metal containers reduced costs associated with moving goods across the ocean by reducing the labor force needed, minimizing theft and damage, and increasing overall transportation efficiency. (Pooler & Hale, 2020) The increase in efficiency due to shipping containers led to expanding the regional supply chain concept to a global supply chain.

In the decades since the introduction of the shipping container, ocean freight volumes have increased, and those volumes only experienced a contraction during the financial crisis in 2008 - 2009. Even though transit volumes increased, the industry experienced marginal returns. The causes of the marginal returns were varied. However, it is theorized that shipping companies contributed through inefficient capacity management and purchasing larger vessels. (Telling & Milne, 2023)

A.P. Moeller Maersk

Maersk's website presents its history from its inception to today. A.P. Moeller Maersk's roots began in 1904 when A.P. Moeller and his father founded the Steamship Company Svendborg. Eight years later, after resistance from board members to expand, A.P. Moeller separated and founded the Steamship Company of 1912 or the entity known today as A.P. Moeller Maersk. Aided by the necessity of trade expansion during and after World War I, Maersk established itself as a leading shipping company in Denmark. The company began to evolve into other aspects of the ocean freight industry by leveraging economic conditions post World War I. Throughout the decades after World War I, Maersk evolved into a global shipping company, cultivating a reputation as one of the world's largest, by volume, and most reliable shipping container companies by on-time performance. (*Our History*, n.d.) Figure 1 below is a snapshot of shipping container carriers and their on-time performance for 2019. Maersk posted an average on-time rate that was eight percent higher than the industry average for this period before the pandemic.

Figure 1



Note: (Staff, 2020)

Pandemic Performance

Capacity

Non-Controllable

The most critical resource of the global supply chain is the labor force. With COVID-19 directly impacting the labor force, ripples were felt across the supply chain. Many transport operations, including port cargo operators and truck and rail companies transporting goods inland, are considered essential businesses in nations closing different economic sectors. (*Covid 19 Pushes Shipping Companies to Apply Survival Mode*, 2020) In response to the pandemic outbreak, industrial cities in China, such as Shanghai, Changchun, and Shenzhen, were placed into lockdown, or activity was severely restricted. The restriction of the labor resource disrupted the flow of goods, crippling supply chains and causing shipments to be diverted or experiencing long queues. (“Shanghai Lockdown Will Hike Logistics Costs, Warns Maersk,” 2022) Additionally, the imposed restrictions led to global port congestion, equipment shortages, and longer, costlier delivery timelines.

Ports

Before the pandemic, ports experienced pressure to upgrade their infrastructure by automating operations, decarbonizing logistics, and building facilities that could handle the new generation of ever-larger ships. (Plimmer & Dempsey, 2021) Due to lockdowns and governmental regulations during the pandemic, the maritime intelligence company Windward estimated that 20% of all shipping vessels globally were waiting outside ports, with nearly 30% of the queued ships outside China's ports. (Thuermer, 2022) In the western hemisphere, Los Angeles and Long Beach ports have experienced queues of up to two weeks for ships to drop anchor and unload their cargo. (Plimmer & Dempsey, 2021) An executive from the Port of Los Angeles has

rationalized the current queue and labor situation as attempting to squeeze ten lanes of traffic into five. Despite the current problem, a record amount of cargo and containers pass through daily. (Thurmer, 2022)

Equipment and Labor Shortages

In the article *Global demand isn't booming. So why are shipping rates so high?* Greg Miller states that the current ocean freight capacity is curtailed by congestion, with equipment tied up on both land and sea. (2021) Shortages of truckers and chassis and an inadequate workforce at major US ports contribute to the current equipment logjams. (*Industry Outlook 2022: Awaiting Normalcy of the Supply Chain*, 2022) Numerous initiatives have been undertaken by all stakeholders to alleviate congestion issues, including extending port hours and pop-up yards. However, identifying a long-term solution has yet to succeed, which has relegated the industry to temporary solutions. (Thurmer, 2022)

Additionally, new larger ships have contributed to supply disruptions as shipping conglomerates have aimed for economies of scale to reduce overall costs. The use of larger vessels means diminished port calls or visits. (Plimmer & Dempsey, 2021) However, with larger ships operating, the number of containers carried is proportionately larger. Due to queues and congestion at ports, many containers are being held up in the unloading/release process, causing additional limitations on the empty container supply.

As ships and containers queue up along the supply chain, there is a need for more necessary equipment. With no more vessels to charter or containers to use, every little disruption to the supply operation adds to the cargo that is not moving. Carriers need up to twenty-five percent more capacity to carry the current cargo volume. (Miller, 2021) Shortages of containers and the uncertainty of moving freight led shippers like Amazon, Ikea, and Walmart to invest in ownership

of shipping containers or chartering ships to ensure the movement of their goods from supplier to end consumer. ((“Performance of Maritime Logistics,” 2022))

Controllable

Capacity Management

Since the pandemic began, shipping companies have parked ships, canceled hundreds of sailings, sent vessels on longer routes, or even practiced the action of slow steaming. (Pooler & Hale, 2020) The implementation of capacity management strategies in the industry is to control overall operating costs and freight rates. Organizations will not focus on one specific process to impact prices and rates significantly. Instead, they will use a mixture of strategies.

Maersk deployed an active capacity management strategy to maintain and stabilize increasing freight rates. Some examples of this strategy include blank sailings, suspending services on specific routes, and re-routing to keep a ship's utilization factor high and reduce overall costs. (Chua et al., 2022) According to former Maersk CEO, Soren Skou:

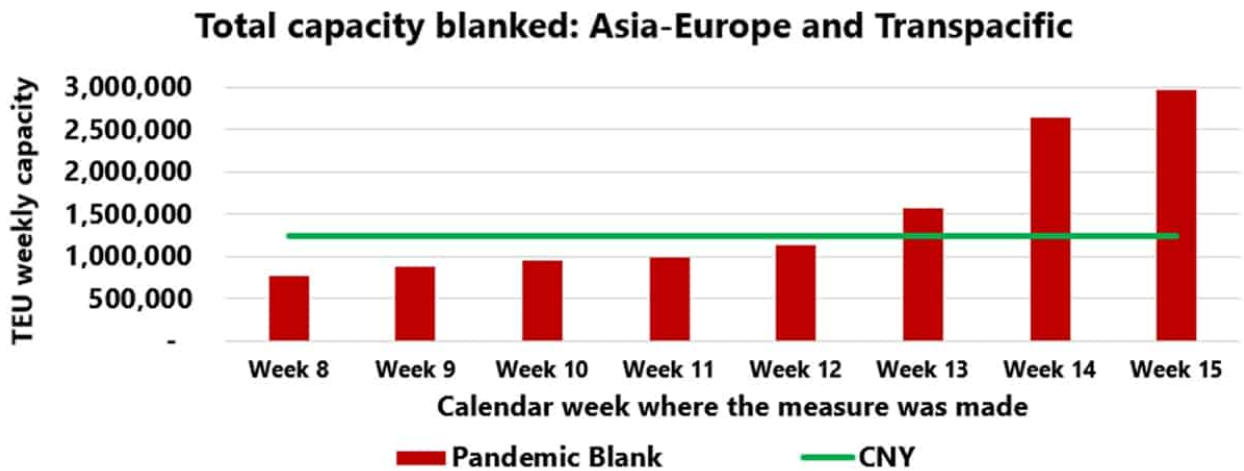
"In 2009, the thinking at Maersk, and the whole industry, was that if you had a network, you would have to keep sailing it and filling it up at all costs. We lowered prices to fill the network. That approach has now completely changed...We now have a much bigger network, simplifying taking out capacity." (Freightwaves, 2020)

In Q2 of 2022, Maersk "blanked" or canceled more than 166 sailings across its networks. (Freightwaves, 2020) Along with canceled sailings, Maersk joined other carriers in idling vessels so they could undergo repairs and maintenance in drydocks. As well as practicing slow steaming, the intentional act of sailing slower supports the overall capacity management strategy. (Miller, 2022) Maersk combined all these strategies under the label of active capacity management. Skou was quoted again in a 2022 article by Greg Miller:

"We aim to deploy the capacity needed to serve the customer demand out there - and no more than that. If market demand drops, we will take capacity out at the same percentage.

Every carrier will do what it thinks is right. " (Miller, 2022)

Figure 2



Note: Blanked sailings through April 2020, (Miller, 2020)

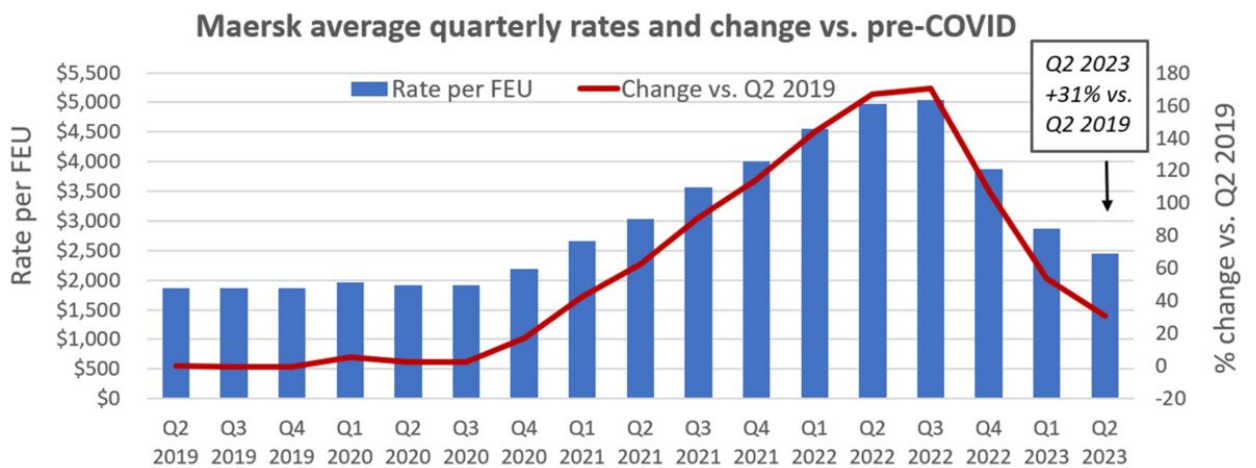
Pricing

In a study commissioned by the International Transport Forum (ITF) in 2022, ocean freight rates have increased so much that air cargo has become a cost-competitive alternative. Some shippers have decided to shift to air cargo, considering the problems with schedule reliability and difficulty securing containers on vessels. (“Performance of Maritime Logistics,” 2022) Global trade research firm Panjiva found that freight rates have risen 285% since the beginning of the pandemic. During the same period, container prices fell 30%. (Thuermer, 2022) Capacity management helped prop up rates, especially in the spot rate market compared to contract rates. Maersk Spot, an online booking platform, accounted for up to 50% of Maersk's spot volume during the pandemic. (Freightwaves, 2020) Maersk Spot offers customers a port-to-port cargo guarantee

at a fixed upfront price. Ultimately, this allows customers to move their cargo more simply and reliably. (Staff, 2019)

The most significant benefit of the spot market for carriers is that it is a commitment. Customers commit to the rate and must show up with a container or pay a fee. With this commitment from the spot rate market, it is easier for carriers to plan a ship's utilization on a voyage and avoid blanking and rolling back the journey and its freight until the utilization is acceptable. (Freightwaves, 2020) If Maersk moves or rolls the cargo, Maersk will compensate the customer for missing the agreed-upon guarantee. Maersk Spot is available on all trades except for origination and termination in the US. However, a petition has been filed with the Federal Maritime Commission to offer this service in the US. (Staff, 2019) As of 2023, Maersk has 68% of its ocean business under long-term contract and 32% in spot market volume. (Miller, 2023)

Figure 3



Note: (Miller, 2023)

Revenue

The elevated freight rates and capacity management resulted in high profits for container lines. In 2021, many carriers realized record annual revenues. (Thuermer, 2022) In the second quarter of 2020, when the coronavirus peaked, Maersk reported a net income of **\$443 million**. This

net income value was nearly triple compared to the second quarter of 2019. (Freightwaves, 2020) When comparing Maersk's year-over-year revenue performance, Maersk experienced a 55% revenue increase from 2021 compared to 2020. In 2021, realized revenue was **\$61.8 billion**. (Theurmer, 2022) However, 2023 has not been as kind to the ocean freight industry or Maersk.

“Maersk reported that its first-quarter profit share was **\$2.28 billion** compared to **\$6.78 billion** the previous year. Underlying profit declined to **\$2.56 billion** from **\$7.47 billion**. Total revenue declined to **\$14.2 billion** from **\$19.3 billion** the prior year. The company said its first-quarter results reflect the normalization of global demand and supply, characterized by the inventory corrections seen in Western economies over the past two quarters. The company noted that this resulted in significantly lower profitability of the three main businesses compared to a year ago, particularly in Ocean, where the profit was lower due to lower volumes and freight rates.” (*A.P. Møller - Mærsk Q1 Profit Declines, Revenue, 2023*)

Future

Lessons Learned

The pandemic has highlighted the need for greater coordination, information, and supply chain digitization. (Plimmer & Dempsey, 2021) Supply chains must be customer-centric. If the demand is bigger and better, that should be the focus. However, bigger is not the solution if the market needs efficiency. (*Industry Outlook 2022: Awaiting Normalcy of the Supply Chain, 2022*) Analysts see a transition in the ocean sector from a significant undersupply of capacity towards more balance between supply and demand. (Theurmer, 2022) Additionally, there will be a shift in the global supply chain from dependence upon a few critical geographic locations to regionalized supply chains that have an increased resilience to outside influences. Along with the location shift

of the global supply chain, digitization of the supply chain will provide stakeholders with advanced software to build effective and better interactions with their customers. (*Industry Outlook 2022: Awaiting Normalcy of the Supply Chain*, 2022)

Integrated Solutions

Technology erases distinct boundaries between transport modes, pushing companies to collaborate on intermodal logistics. (Staff, 2020) Maersk and fellow ocean carrier CMA CGM are moving away from simply hauling containers from port to port. Instead, they are investing in a new holistic supply chain approach with services that can deliver more value through long-term customer relationships. (Kulisch, 2023) With this new holistic supply chain approach, Maersk can move goods by ocean, air, truck, and rail, offering warehousing and customs clearance. (Kulisch, 2021)

Maersk is focusing on strengthening its product offerings by building a solid network of logistics and services that ensures customers have every option to transport goods. This integration of its logistics services places the customer at the center of every decision made. (*Industry Outlook 2022: Awaiting Normalcy of the Supply Chain*, 2022) Maersk is using its substantial ocean profits during the pandemic to branch out into air cargo, over-the-road freight, and expanding rail offerings to accomplish an integrated service offering. (Kulisch, 2023) As a global leader in shipping services, Maersk can offer its customers services that will reduce inventory and improve response times at an affordable price. (*How Amazon, UPS and Maersk Meet Covid's Logistics - ProQuest*, 2022)

Methodology

Data Collection

The research and data collected for this paper are applied studies using qualitative analysis. Primary research and data are provided through examination of scholarly literature and

data analysis to understand the impact of the Coronavirus on the ocean freight industry. Research data was limited to a timeline of 2019 and later, which coincided with the COVID-19 timeline. Pre-pandemic research was limited to the use of Maersk's website detailing the organization's history, as well as significant events in the industry.

Certain areas of industry-specific data were gathered to accomplish a holistic view of the global supply chain. This information was associated with challenges seen consistently across the gathered data. In gathering this data, common themes and challenges were presented, and so was the organization Maersk. With so many commonalities, it was decided that Maersk would be the focus of the data to portray industry challenges.

Analysis

To fully illustrate the state of the supply chain within the ocean freight industry, it became necessary to pinpoint a central theme. With common challenges and themes presenting themselves in the collection phase of the research process, the analysis and research framework took shape. It was decided that the central theme of the research will focus on capacity during the COVID-19 pandemic. As the collected data was analyzed, it became clear that there were challenges that Maersk could control the potential outcome, as well as uncontrollable challenges.

Discussion and Future Work

Discussion

Through the research presented and the organization of this piece, the depiction of the chaos caused by COVID-19 is actualized. However, the author believes that on a grander scale, the entire maritime industry deserves a thorough analysis of qualitative and quantitative data pre-pandemic, during the pandemic, and post-pandemic. Establishing a comprehensive pre-pandemic

state of the maritime industry was not critical to the intent of this piece. Instead, significant historical events and developments in the maritime sector are used. The historical information presented is vital to this piece due to the information's prevalence during and post-pandemic.

The ability of this piece to educate and initiate profound thinking coupled with the subject matter of this research, the shipping conglomerate AP Moeller-Maersk. Using an organization that is one of the quintessential ocean freight shippers, like Maersk, advocates for the validity and necessity of the research presented. Challenges presented by COVID-19 would be homogenous across the ocean freight sector. However, their reaction and strategy implementation would differ based on an organization's resources. Due to the sheer size of an organization like Maersk, strategy implementation would be critical for its fellow competitors and global economies.

With global economies dependent upon ocean freight to move such massive quantities of goods from point A to point B, the ocean freight sector is a critical component of the global supply chain. The limitations of the global supply chain were exacerbated by the obstacles presented to ocean freight shippers. With the added pressure on the global supply chain, it became necessary for all associated parties to evaluate their position and ability to fulfill market demand.

Future Work

The true impact of COVID-19 is still to be understood. However, the radical changes and implementations it caused are undeniable. These changes have resonated across continents, economies, and industries. COVID-19 caused what would have been years of evaluation and research before implementation to accelerate to a matter of months. To survive the new

economic landscape, countries and organizations faced the decision to change or to risk paralysis and even outright demise.

While challenging, the decision to change and adapt to new threats has created a vastly different landscape than just four years prior. In terms of a global supply chain, this new landscape consists of agile and responsive groups that limit any influence of potential disruption. Increasing the agility of the supply chain has allowed organizations to achieve higher efficiencies and reduced lead times, allowing market demand to be satisfied in shorter overall times. It also increases the ability of organizations to scale production to meet current and future market demand.

Over the next decade, researchers will continue to conduct detailed studies to discover the intricate impacts of COVID-19. During this period, studies and research similar to this paper will illustrate a clearer image of the new supply chain. This new supply chain will consist of new thoughts and ideas that have yet to be introduced or adopted. Even the supply chain, as it is today, will look different in ten years.

Conclusion

The impact of COVID-19 reached unprecedented levels across the global supply chain. In particular, the ocean freight industry and its participants saw increasingly complex challenges. Organizations adopted varying strategies to combat the growing challenges of moving freight. During the pandemic, shipping giant Maersk adopted approaches to control limited capacity and increase freight rates. Implementing capacity and rate strategies allowed Maersk to survive the pandemic and thrive. Furthermore, Maersk has developed and administered a new corporate strategy. This new corporate strategy diverts Maersk's efforts from a single logistics entity to an integrated solution provider. The organization's shifts are directly attributed to the lessons

learned during COVID-19. As the global supply chain's future shifts, so does each participating entity's focus. The global supply chain, as we know it, will never be the same.

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