

Trade Change in Shipping and Logistics : The Case of HMM

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Abstract

The objective of this paper is to investigate digital transformation in logistics within the shipping and logistics industry. This paper examines the case of Hyundai Merchant Marine (HMM) and draws insights from its success in becoming the top company amidst the industry challenges. To achieve a more in-depth analysis, a single-case study approach was employed. Various secondary data have been analyzed to support the examination of HMM's digital transformation. HMM has emerged as a global leader in transportation services. The company's success is attributed to its development of diverse ships, robust logistics systems, and pioneering a digital logistics platform, ultimately overcoming the crisis. Especially, this paper show that the digitalization of logistics has been analyzed as the most significant transformation. The findings of this paper can offer valuable implications for other companies grappling with similar challenges in the current trade landscape.

Keywords: *Shipping, Logistics, Transportation Sevices, HMM, Digital Logistics Platform*

1. Introduction

1.1. The Crisis of Shipping Industry with slowdown in International Trade

In 2019, the coronavirus pandemic had a negative impact on global trade [1, 2]. According to the WTO, it has published some reports on these changes. Production disruptions, supply chain issues, and declines in consumption due to the pandemic have affected global trade [3, 4]. The slowdown in trade may also be affected by changes in trade policies between specific countries, tariff increases, trade restrictions [5, 6]. Whenever such policy changes occur, the WTO strives to identify trends in international trade by analyzing its impact and producing reports. Instability in the global economy can have a negative impact on trade [7, 8]. Financial crises, uncertain political situations, or other unpredictable economic factors can cause companies to reduce investment and consumers to reduce consumption. may lead to a decline. Changes in trade policies between countries can affect global trade [9]. For example, increased tariffs, trade restrictions, or amendments to trade

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agreements can lead to a decrease in trade [10, 11]. Pandemics and natural disasters: Large-scale pandemics or natural disasters can impact supply chains, placing restrictions on trade. One such example is the coronavirus pandemic, which has caused production and transportation problems in several countries, leading to a decline in trade [10]. Fluctuations in exchange rates can also affect exports and imports [12, 13]. If a country's currency strengthens, that country's exports may become more difficult and imports may increase. As technological advancements change production methods, some industries may shrink while others may increase [14]. This will change the structure of trade between specific countries or regions. Uncertainty in one sector can spill over to other sectors. For example, if production decreases in a particular industry, other sectors related to that industry may also be affected [15]. Above all, global trade is complex, with many factors interacting to influence it [16]. Figure 1 illustrates that a marked decline in the trend of global trade, particularly after the onset of the COVID-19 phenomenon. The slope of the trend has significantly decreased, indicating a shift in the trajectory for the foreseeable future. Therefore, to determine the exact cause, data and circumstances at a specific point in time must be taken into account.

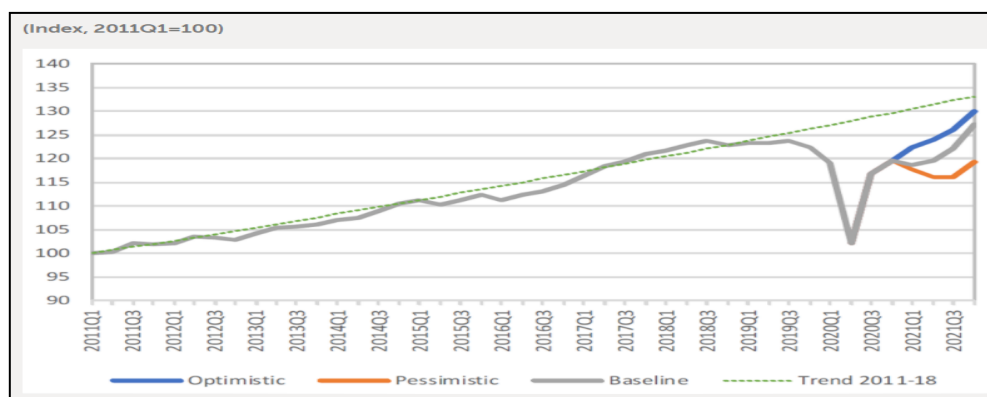


Figure 1. Trade Trends in global products

Source: WTO Report(2021)

2. Background of the Study - Income Elasticity

Income elasticity refers to how sensitive the demand for a specific product or service responds to changes in consumers' income [16, 17]. Income elasticity of trade is a concept that measures how sensitive the demand for specific goods or services in world trade is to changes in overall world income [17]. When the demand for a particular good or service increases proportionally with an increase in consumer income, that good or service is said to have a positive income elasticity [18, 19]. These characteristics generally appear in high-end goods or trade between specific countries. On the other hand, when the demand for a specific product or service decreases as consumer income increases, that product or service has a negative income elasticity [20]. This can mainly be seen in consumer staples or low-cost products. In world trade, different products and services may have different income elasticities [21]. Some industries may experience significant increases in demand with economic growth, while others may not respond as sensitively to income increases [22]. Importantly, understanding and analyzing these characteristics involves looking at trends in international trade and trade policy decisions. Figure 2 shows the changes in the Income Elasticity of world trade. Under these various

influences, world trade continues to stagnate. In this downturn, companies in the shipping and logistics industry in particular have made many efforts to change. This paper examines companies that have attempted transformation.

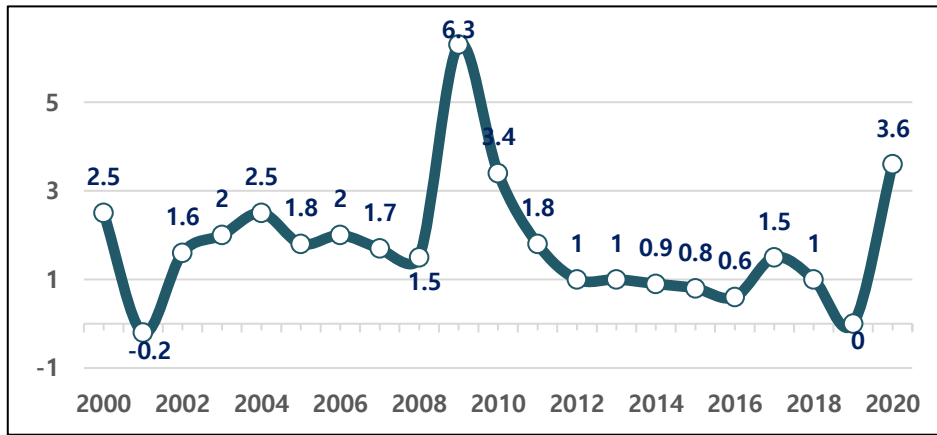


Figure 2. Income Elasticity of world trade

Source: WTO Report(2021)

3. Introduction to Representative Companies - HMM

HMM is a comprehensive shipping logistics company that provides world-class transportation services. We are building a variety of ships and logistics systems, leading the shipping industry through a wide route network, and providing the best service based on skilled shipping professionals. HMM has 6 overseas headquarters, 27 corporations, and 60 overseas branches worldwide, as well as 5 overseas offices, and is demonstrating the world's highest level of competitiveness in fierce competition based on a high-level IT system and strengthening its competitiveness. I'm doing it. In this way, HMM is continuously working to grow into a leader in the global shipping logistics industry, taking the lead in realizing a sustainable community, and leaping forward to a higher level of development by providing advanced logistics services and customized services to customers. HMM plays an important role in the national economy by transporting various import and export products as well as materials such as crude oil, iron ore, and coal, and is striving to provide the best logistics services amid global logistics chaos. HMM values connection with customers, considers customers as partners, and is creating partnerships that grow together by sharing knowledge and experience. According to HMM's IR Report [24], it is responsible for container transportation at a rate of over 90%, and this appears to be HMM's weakness. In addition, 5% is in charge of bulk cargo transportation, and the remaining 1% is engaged in terminal operation and rental business.

3.1 The Strategy Change of HMM

HMM is one of Korea's leading shipping and logistics companies, and its decision on strategic direction is influenced by a variety of factors both internal and external to the company. In particular, the shipping and logistics industry is very sensitive to global economic trends, international trade environments, etc., so strategies from various aspects are needed. It is important to quickly identify and respond to trends and changes in global trade. By predicting and responding to economic uncertainty, changes in trade policy, and regional conflicts, you can lay the foundation for stable operations. The introduction of digital technologies in the

logistics and shipping industry helps improve efficiency and enhance competitiveness. Strategies are needed to optimize the logistics chain and reduce costs by utilizing real-time data analysis, blockchain technology, and artificial intelligence. Additionally, environmental issues are emerging as an important issue in the shipping industry. By adopting environmentally friendly operating strategies, such as using eco-friendly fuels, reducing carbon emissions, and utilizing renewable energy, we can strengthen our corporate social responsibility and respond to international regulations. Shipping companies must maintain and expand their international networks to respond to demand in various regions. In addition to developing new trade routes, strengthening relationships with cooperation partners is also an important strategy. Lastly, in an ever-changing global economic environment, you must be able to quickly respond to market changes by adopting a flexible business model. It is necessary to review existing business models and explore new opportunities.

3.2. HMM's Strategies for Responding to Crisis

Companies such as Maersk and MSC have increased the number of port terminals by more than 30 last year in preparation for the situation caused by COVID-19. In contrast, HMM is the only one that has secured only one terminal, the Singapore terminal. Port terminals are a key element that determines the capabilities of shipping companies, and they serve as a shield to overcome recessions. As the ship arrives at the designated time, it has the effect of increasing punctuality and reducing logistics costs. It seems inevitable that HMM, which achieved high performance last year, will be kept in check by its competitors, who are expected to make an even higher leap forward. Last year, Maersk acquired six companies in fields such as aviation logistics and e-commerce and is establishing a comprehensive logistics network by securing 85 warehouses. It is also making a mark in the carbon neutral competition by ordering the world's first eco-friendly container ship using methanol. As congestion at global ports worsened in the aftermath of COVID-19 and freight rates soared, the so-called shipping 'Big 3', including Maersk, MSC, and CMA-CGM, recorded a record amount of over 20 trillion won each. Maximum operating profit was achieved. HMM, a domestic shipping company, also has the nickname 'HMM+Tesla', with its stock price rising significantly as it recorded the highest operating profit ever of KRW 7.37 trillion. In August 2022, Maersk ordered the world's first ship to spend 1.6 trillion won on eight ultra-large container ships to use methanol as fuel, reducing greenhouse gas emissions by more than 25%. In the same year, CMA-CGM established an air logistics company and acquired FMS, a container terminal in Los Angeles, USA, for \$2.3 billion. The race to scale down, which began when Maersk introduced 15,000 TEU in 2006, resulted in oversupply and the resulting long-term decline in freight rates, resulting in the disappearance of half of the world's 20 container carriers. Hanjin Shipping, which went bankrupt in 2017, is also a victim. The government has been obsessed with rebuilding shipping for five years after the bankruptcy of Hanjin Shipping, which was once the world's seventh largest in terms of cargo volume. The only remaining HMM managed to revive by acquiring 20 ultra-large container ships with government support. However, while Korea is busy recovering cargo volume, the gap with global shipping companies has widened further. Korea also lags behind in supply chain competition, with the Big 3 securing 28 additional dedicated port terminals in 2021 alone. Shipping companies with dedicated port terminals can unload cargo without going through an external terminal operator. Unloading costs, which account for 30% of total logistics costs, can also be minimized. Maersk, which is estimated to have added at least 10 terminals, surpassed the industry average with a cargo arrival rate of 47.5% in April despite the ongoing logistics crisis. The Big Three competed fiercely in vertical integration that went beyond shipping and encompassed the entire supply chain, including land and air. HMM has recorded good performance along with strong shipping rates until early 2021. Due to the spread of COVID-19 and port backlogs in the United States, shipping rates on Asia-North America routes have risen, and the shipping industry has been greatly improved. However, container shipping rates have been falling

rapidly recently, raising concerns about a recession in the shipping market. However, even in this situation, domestic and foreign shipping companies are increasing their fleet capacity. It is a way to survive the recession and not fall behind in the competition when entering the boom period. HMM, the leading domestic company, is expected to increase its fleet to 1.2 million by 2026. The shipping logistics industry has faced many challenges due to the COVID-19 pandemic. During this period, HMM overcame the crisis and achieved successful results through several strategies.

3.3. HMM's Innovation Strategy

HMM implemented agile management innovations to respond to the slowdown in trade and lower demand caused by the pandemic. We strengthened the company's competitiveness and overcame difficult times by reducing costs and improving efficiency. HMM has increased its competitiveness in the logistics industry by expanding its global logistics network and strengthening partnerships. In particular, we strengthened cooperation with other shipping companies to optimize transportation capacity and improve service quality. HMM also attempted to diversify its operations across different markets to diversify its risks. We sought to secure diverse sources of revenue by pioneering new trade routes and advancing into new service areas. In addition, HMM emphasized its response to environmental issues by strengthening its eco-friendly policies. Interest in corporate sustainability has increased through the introduction of eco-friendly ships and the provision of low-carbon logistics services. In response to the uncertainty in global trade caused by the pandemic, HMM emphasized rapid decision-making and response capabilities. Optimized business models by predicting and coordinating trends in economic changes and trade policies. Additionally, shipping is one of the industries that often requires government support. HMM has leveraged government support policies and funding to maintain stability and increase the sustainability of its business. Through these strategies, HMM was able to maintain stability even during difficult times, successfully overcome the crisis, and maintain and expand its competitiveness in the global logistics industry.

3.4. HMM's Operation Strategy

HMM has opened a new regular container route connecting Busan and the East Coast of South America to expand the maritime transportation network. As domestic export companies are expected to expand maritime exports to India and South America, HMM will operate a regular Far East-South America container route connecting Busan and the eastern coast of South America. Panamax-class container ships will be deployed, and the round trip will take 84 days. It departs from Busan and returns to Busan via Shanghai, Ningbo, Singapore, India, Catupali-Durban, South Africa, Santos, Brazil, Paranagua, Itapoa, Navegantes, Buenos Aires, Argentina, Montevideo, Uruguay, Singapore, and Hong Kong. The route is operated solely by HM, independent of the maritime alliance to which HM has joined. Recently, as the shortage of ships and vessels (cargo loading space) has worsened worldwide, global shipping companies are excluding Korean ports from regular routes between the Far East and South America, and shipping services on South American routes departing from Korea have almost disappeared. HMM sailed a temporary vessel from Gwangyang Port for the first time. The temporary ship that has set sail is HMM Hong Kong, a 6,800 TEU container ship scheduled to arrive at Tacoma Port in the United States carrying cargo for domestic export companies. HMM also deployed a total of five temporary ships, including HMM Hong Kong, which sailed for the first time this year. In particular, 'HMM Antwerp' and 'HMM Ulsan' are multi-purpose MPV ships that sailed to New York and Houston on the East Coast of the United States. Multi-purpose ships carry very large special cargo and heavy cargo such as petrochemical facilities and power generation facilities, but can also load containers as needed. HMM is unable to secure new vessels due to the global shipping crisis, but is mobilizing all available vessels

and deploying temporary vessels for the coexistence of domestic companies. In addition, HMM decided to pilot new Internet of Things (IoT) equipment in refrigerated and frozen containers. This is because demand from shippers has increased recently as the number of expensive and sensitive cargoes has increased. By installing IoT equipment on refrigerated and frozen containers, it becomes possible to check and control temperature, humidity, carbon dioxide, and vibration, as well as real-time cargo location, which were only possible on ships. HMM plans to introduce the service in earnest after pilot operation for 1-2 years. HMM has a variety of routes around the world and is working to expand them. HMM will expand existing maritime transportation service routes and expand our network through new tastes. According to HMM's report, from 2020 to 2030, its collaboration with The Alliance will continue to restore trust, improve cost structures and strengthen operational services in the Nordic and Mediterranean regions.

4. SWOT Analysis of HMM

S(strength) is that HMM is Korea's No. 1 shipping logistics company. In 2022, it recorded its highest performance with sales of KRW 13 trillion and operating profit of KRW 7 trillion. It increased its container capacity by 1.5 times the current level, strengthened its competitiveness, and sought to stabilize its business by increasing the proportion of bulk carriers. I'm doing it. HMM is focusing on installing scrubbers on its ships, developing eco-friendly fuels, and expanding low-carbon ships with the goal of becoming carbon neutral. HMM is leaping forward as a global logistics company that creates eco-friendly and sustainable future value, and is pursuing the reduction of greenhouse gas emissions and securing eco-friendly ships, with climate change response, eco-friendly logistics, and safety and health as its core values. The installation of a scrubber, a device that can wash away sulfur oxides in exhaust gases with seawater, is also a standout feature. In addition, in the social sector, the supply chain includes various companies such as container terminals and railway companies around the world, with a focus on mutual growth with the supply chain, customers, and local communities. The company announces sustainable purchasing policies and cooperation matters and is complying with them. HMM's W (weakness) is that it is focusing on the container business. HMM places a large emphasis on containers, accounting for over 90% of the total. In fact, it has reached a point where companies cannot operate without containers. Accordingly, it is time to diversify into areas other than containers, but this does not seem to be easy. As for HMM's O (opportunity), it will seek to improve its structure through business diversification prior to full-scale privatization at a time when sea freight rates are on a downward trend. As HMM's financial soundness has improved significantly, the possibility of privatization is being consistently mentioned based on its strong performance. While waiting for the government's privatization plan, HMM is focusing on securing competitiveness by improving its structure and diversifying its business by using its abundant liquidity. HMM, which is highly dependent on the container business, plans to increase the stability of its business by increasing the proportion of bulk cargo. HMM's T(threat) is that it is under pressure as the market share of global shipping companies increases. The market share of the Asia-America route is also on the decline, and HMM's cargo volume is also decreasing. As the influence of global shipping companies increases, the Americas route is a core route for HMM, so it will need to increase its competitiveness.

5. Discussion

5.1. Future of HMM's Digital Logistics Platform

The analysis of HMM's case reveals the necessity for a discussion on the transformation towards digital

logistics. In this study, it was found that HMM has improved competitiveness and increased efficiency through a strategy of building and utilizing a digital logistics platform. HMM monitors and optimizes logistics and transportation processes through big data and real-time data analysis. Maximize efficiency and reduce transportation costs through logistics network optimization and transportation route planning based on collected data. HMM utilizes blockchain technology to increase transparency of transactions and information and improve efficiency in the logistics process. Blockchain increases the safety and reliability of information, providing a secure foundation for the overall logistics process. In the future, HMM will introduce AI and ML technologies to automate and optimize various logistics processes, including demand forecasting, inventory optimization, and maintenance forecasting. This can help the company save money and improve service quality in the long run. Additionally, it was confirmed that the digital logistics platform can provide a high level of convenience and transparency to customers. The discussion on digitalization in logistics remains crucial for the future

6. Conclusion

HMM seeks to enhance customer experience and increase trust by providing a digital interface that allows customers to check their shipment status in real time and communicate effectively. HMM has been using the Internet of Things throughout the logistics chain to collect real-time location and status information of ships, containers, and vehicles. This increases transparency and ensures flexibility in the logistics process. HMM strengthens cooperation with various partners and ensures interoperability through digital platforms. Through this, HMM was able to expand logistics network and establish a stronger position in the global market. It was confirmed that HMM's various digital logistics are an important strategy adopted by HMM to maintain competitiveness and respond to new opportunities in a rapidly changing logistics environment. This paper will be able to provide practical implications and insights to other companies in the shipping and logistics industry even though when they faced with the crisis.

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