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Effects of Covid-19 Pandemy Over Maritime Transport: An Evaluation of Supply-Demand Balance

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ABSTRACT

This research aims to examine the covid-19 pandemic measurements taken in maritime transport and their possible effects on the supply-demand equilibrium and consequently on the freight market. Covid-19 virus which infected quite large geographic area and people within very short time affects negatively not only every part of our life but also the production and service sector within the globalised world. This is mainly because the future tendency and further effects of this virus are unpredictable. Because of that, most countries are focused firstly on measurements to be taken to reduce the spreading speed of the virus. Although measurements and restrictions seem reduced spreading speed in some countries in short term, those measurements increase the operating costs of production and service companies. On the one hand reduction on cargo movements due to low demand and increasing operation cost due to measurements, have effected the supply-demand equilibrium of maritime transportation. This research examined the effects of already taken and could be revised measurements due to the present situation and possible future tendency of covid-19, and its consequential results on the freight market.

Key Words: Covid 19, maritime transport, supply-demand equilibrium, freight market.

INTRODUCTION

Covid-19 has been effecting all our life since December 2019. The World Health Organization (WHO) announced a pandemic on March 11, 2020. It is considered as a disaster for mankind and the World is trying to adopt strongly to the change faced as a result. The main features of covid-19 are high infection rate and there is no confirmed treatment as the virüs is unknown medically. This increases the tension and fear within the people and the states are trying to take necessary measurements to protect their nation. Although the measurements are taken in goodwill to protect the people life, on the one side it restricts the normal life of them and, on the other side, the working environment is affected badly. The restricted life has resulted in low demand for goods. Low demand for goods is lowering the supply of goods. Low need for supply is lowering the number of

jobs. And finally, low available jobs is increasing the number of jobless and this is lowering the purchasing power ending up with a further decrease in demand, and so on.

Nature itself has a rule and adapt to the changes. People, as a part of nature, adopted themself by changing their daily lifestyle. Similarly, the industry is also, being interrelated to nature somehow, have been trying to adapt itself within the rule, so-called balance of supply/demand, set in time. For example, change of lifestyle is changing the supply chain operation due to the change in demand volume and the way of service needed. The main features of covid-19 effects are unpredictability. Therefore, no one can foresee what is going to happen next and how the market will suffer as a result. Being the main part of the supply chain, the maritime transportation industry is also trying to adapt itself within the parameters. The states and their regulatory bodies are imposing measurements and re-set the rules to cope with the adverse effect of covid-19 and new rules enforced by the governments and international maritime organisations. Therefore, there is a need for addressing the measurements which have already been taken and its consequential effects in the maritime transportation industry to provide easy adaptation of other related sectors.

Ivanov & Dolgui (2020), introduced the first time the term of Intertwined Supply-Chain Network (ISN) to define the integrity of interconnected Supply Chains (SCs). They commented that ISN secures the supply of goods and services to the society and the market which are essential for long-term survival. They define the viability as the ability of the system to cope with the requirement of surviving in rapidly changing environments. They commented that they take the supply chain resilience researches further ahead by considering SCs resistance to extraordinary disruptions, like covid-19 outbreak, from the viability point of view to avoid market collapse and disruptions in supplying services and goods. They concluded that ISN survivability is a key concern to measure secureness of the supply of goods and services to the society in case of outbreaks due to extraordinary events. But the research is not considering the cost related to such adaptation.

Tevdt, J. (2019) discussed in his research the value of flexibility in the transportation industry from the fact that the ability to lay up the vessels may affect the elasticity of supply and consequently the freight rates. He supported his conclusion by addressing the demand side of the maritime transport inelastic to the freight rate as the transport cost of a good is only a small portion of the value of the good to the end-users, whereas, the supply side is elastic to freight rate. In other words, low freight rate increases the lay-ups which eventually increases the freight rate to a limit as re-entry of layup vessels will balance the increase in demand to a certain limit. Bearing in mind that new entries do not have an immediate effect in short term supply as the building of a new vessel takes some time. Therefore, it will not have a balancing effect in short term as much as re-entry of lay-up vessels.

Certain measurements are taken to avoid further infection within the society which could cause to further disruption in their normal life. In return, it will reduce the demand from society. With the same reason, increasing measures in operation will increase the running cost of companies who are serving in the supply side of the maritime industry. This research is aiming to investigate the effect of covid-19 on the maritime transport industry by looking at the reaction of the market in demand and supply side and it consequential result on freight rate. Accordingly, it is expected that low demand and the same level of supply from the maritime industry, will put pressure on freight rates and this, together with increasing running cost, would put the companies who are serving in the supply side of the maritime industry to reconsider staying in the business or not.

Furthermore, this research would guide decision-makers both in legislative and operation side. The measurements are also having pressure on the operation side of supply both in terms of ability and in terms of cost. On the other hand, base on unpredictability features of covid 19, new entrants might evaluate the present market together with the market's short term tendency. Furthermore, the research will provide a clear vision to the market players in case of outbreaks occur due to similar unexpected events sometime in the future.

To reach the goal, after the introduction of the present situation, this research will show the data and tendency in world trade volume to look at the reaction of demand-side and its consequential result over the freight rates. Within this scope, it will also be investigated how the taken measurement is increasing the running costs of the vessels which is eventually triggering the balance effect from the supply side of the maritime transport industry. Then after, the research will emphasise more on balancing phenomena simply by analysing lay-up and new building records within the same time interval. And finally, the reaction of the maritime transport will be evaluated by checking changes in freight rates.

ECONOMIC GLOBALISATION

Globalisation is a fancy name which was emerged in the 1990s to describe the tendency of multinational companies diversifying their operations world-wide (Hopkins, 2002). It can simply be defined as increasing flow of inputs, factors and final products across borders via multinational companies. As a result, there are so many final products flowing around the World which are produced from the inputs coming from different countries. All those are organised /operated by multinational firms but still, they should obey the rules of the state in which they are operating. Previously, they used to produce in a country and sell to buyers in other countries. Globalisation is changing the economic and politic aspects of international trade. Therefore, it contains new opportunities and treats within its new scope. The world's trading volume is decreased by 0.1 per cent in the year 2019 after an increase of 2.9 per cent in the year 2018. In value term, it was totalling US$ 19.051 trillion in the year 2019 (declined by 3 per cent compared with the previous year) whereas world trade in commercial services was totalling US$ 5.898 trillion in the year 2019 (WTO, 2020).

Deepak, N. (2006) commented that the globalisation, despite expectation, did not force a rapid growth in the economy and it increased the gap between the industrialised and under developing countries. In other words, the story of globalisation does not become a fairytale. R. Yacoub & El-Zomor (2020), do not believe that the adverse effect of pandemic over globalisation is temporary. They commented that in the long run, it will prove the nations against globalisation.

MARITIME INDUSTRY

The United Nations Conference on Trade and Development (UNCTAD) commented that 80 per cent of internationally traded good are transported by sea. The volume of those international traded goods last year were accounting to 11.08 billion tons out of which 811.2 million TEUs were handled in container ports. The volume is recorded as an all-time high. As per the same report, at the beginning of 2020, the maritime transport is served by 98,140 vessels totalling 2.06 billion DWT carrying capacity (UNCTAD, 2020). But it seems that it will not reach to that point because of rising concern about future uncertainty caused by effects of measurements taken against pandemic on

top of the trade policies which had been implemented by some developing countries before covid-19.

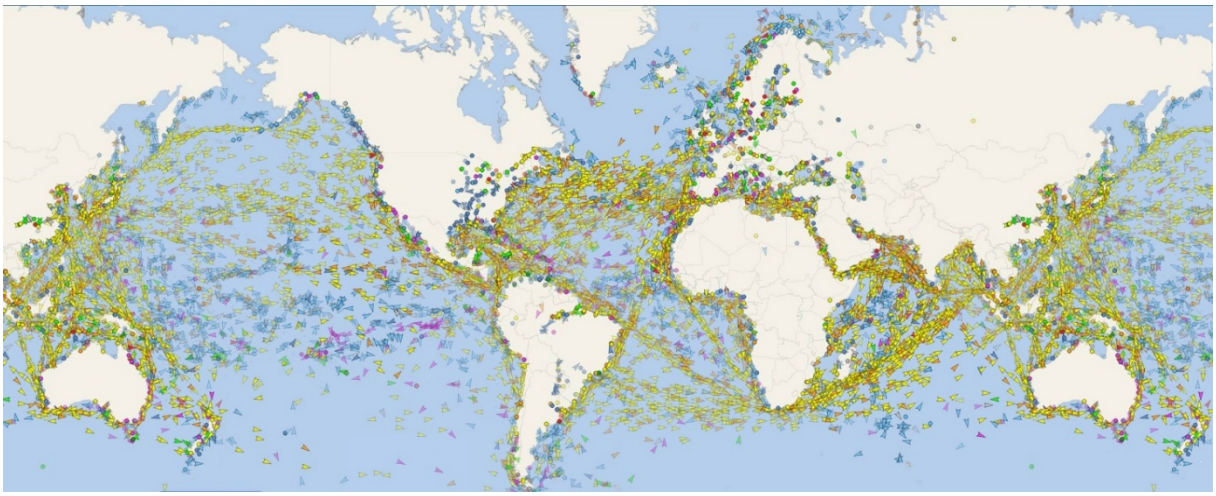


Figure.1 Instant Marine Traffic (Marine Traffic, 2020).

As per Port Call and Performance Statistics (UNCTAD, 2018), the annual number of port calls are 5.045.591. Figure.1 is showing vessels' movements all around the World. Maritime transport is a huge network composed of interconnected service providers located all around the World. The key service providers are ports, shippers, ship-agents, ship chandlers, bunker suppliers, ship-repair companies and shipbuilding companies. There were 939 container ports in the world serving the liner shipping services as of 2nd quarter of 2020. But not all ports are having direct service between them.

If it would be possible than theoretically there would be 440,391 direct port-to-port liner shipping connections. But in fact, there are only 12,748 ports which have direct connections which are less than 3 per cent of the theoretical value of liner shipping connections. The remaining actual ports are serving as transhipment ports (Hoffmann & Hoffmann, 2020). Other key players of maritime transport are about 2 million seafarers who operate the ships worldwide. Furthermore, as per estimation, there will need for 300,000 crew changes starting in June-mid 2020 (UNCTAD, 2020). Sustainable supply chain depends on the efficient operation of all players within the network. Therefore, being the major player, maritime transport also needs to adapt itself to the present condition for a smooth operation.

COVID-19 AND MEASUREMENTS TAKEN AGAINST IT

Mankind has been suffering from flue kind epidemic since ancient age. The main features of such epidemics are that being fatal, having unpredictable results and repeating within 10 – 50 years. As per researchers, within the last 400 years, there were about 10 epidemics caused by influenza most of which was started and spread all over the world from China. Table.1 below is showing the latest fatal epidemics caused by influenza. The most terrible one was Spanish influenza which was caused to death of more than 40 million people (Karaoğlu, Ömer, 2020).

Table1. Fatal Epidemics Caused by Influenza

Name / Origin	Duration	Number of Death
Global Influenza	1889 – 1890	1 million
Spanish Influenza	1918 – 1920	40 million +
Asian Influenza	1957 – 1958	2 million
Hong-Kong Influenza	1968 – 1969	1 million
Global H1N1 Influenza	2009 – 2009	203 thousand
Covid-19 – China	2019 -	1.1 million + (as of 30.10.2020)

The last epidemic was caused by covid-19 which first appeared in Wuhan District of China in December 2019 and spread all over the World quite fastly. As of October 30 2020, 45,041,948 people infected from corona-19 and 1.181.32 people lost their life (Worldometer, 2020). The number of infected people and dead people is increasing day by day.

The United Nations (UN) and the European Union (EU) was created at the end of World War II for a similar reason: fighting against a world's catastrophe. It was a good example of how the common fate tends to bring different countries together when they face difficulty. Physicians and Medical Researchers around the globe are racing time to invent the most effective vaccination for covid-19. Countries are sending doctors and medical supplies to each other. For example, Britain, Germany and France had offered a $5.5 million package and medical materials to Iran (R. Yakoub & El-Zomor, 2020).

It is a common interest for all countries, governments and international organisations to fight against pandemic collectively to minimize and finally eliminate (if possible) the risk of human health and in the meantime securing the supply of goods and services to the society. Doumbia-Henry (2020) states that there is a remarkable co-operation within the United Nation (UN) agencies. Those are namely World Health Organisations (WHO), International Labour Organisation (ILO), International Maritime Organisation (IMO) and International Civil Aviation Organisation (ICAO). Also, the maritime transportation players (ports, ship management companies, provision and bunker suppliers, stevedores, ship-agents, ship-repair companies, ship-yards) are playing important roles in fighting against the pandemic. But, the lack of strong leadership and absent of strong central international institution makes it difficult to fight against the negative effect of the pandemic more effectively.

For example, the WTO, the international organization responsible for promoting free trade, is at its weakest time in terms of directing the powerful states, like the USA. Similarly, the EU which is considered as the most integrated international organization is having a problem with reacting in unity. Member states are choosing an isolation approach rather than being cooperative to fight against the pandemic. Many member states like Austria, Czech Republic, Poland, Slovakia, Denmark, Hungary, and even Germany are, as the first reaction, restricted travelling within EU countries and moving of goods from other member states. Some defined the globalization as the universal interdependence of nations and free moving of goods and services all around the world. That is why most countries believe that it is the main reason for currently faced covid-19 pandemic crisis. It is further argued that a huge amount of international transportation system has the power to convert a local disease, like the one we faced with covid-19 into pandemic using the mobilization

provided by this system. Number of the huge amount of flights, cruises together with the high mobility of workers and goods make the world more open to such risk. Initially, most countries have closed their borders to maintain public health. Many of them also take different trade-restrictive measures like banning the export for some items temporarily, requiring authorization to export certain materials and other restrictions on exporting special various medical products and strategic food products. Restrictions also extended to import, like the ones imposed by Russia and Brazil. But all those preventive and protective restrictions have adverse effects on international trade and globalization (R. Yakoub & El-Zomor, 2020). Those adverse effects, consequently, upset the balance of maritime transportation.

As per the result of the survey conducted through decision-makers from six continents to find out the critical issues that the maritime industry is facing, the most of the participants (93 per cent) agreed that the pandemic more likely will make a global economic crisis. Moreover, the survey identifies the pandemic is the least critical issue that the maritime industry is prepared for (Global Maritime Issues Monitor, 2020).

RESTRICTIONS / MEASUREMENTS OVER MARITIME TRANSPORT

Every country and international organisations have imposed different measurements against covid-19 pandemic and most of them somehow had effected the maritime industry.

Ship Management/Documentation

The most international maritime bodies have targeted first the safety of crews on board. WHO prepared a document to guide authorities who are involved in response to covid-19 public health events on board a vessel (World Health Organisation, 2020). As per this guidance, for example, passenger vessels sailing internationally are advised to develop and inform the crew onboard the outbreak business plan which is mainly describing how to handle the case if they face. This includes many reportings, keeping data about boarding, disembarkation, screening and cleaning/disinfection of vessels. All of these are additional requirements which need to be organised and coordinated by the owners/ship management. The European Union's Ship Recycling Regulations (EUSRR) will pose an obligation to all ships of 500 gross tonnages and above regardless of what their flag is. That is when they are calling a port or anchorage of a country which is a member of the European Union (EU) or The European Economic Area (EEA) they should have on board an inventory of hazardous material (Srinivasan, 2020).

Crew Changes

Closure of borders and airports mostly affected the crews who are defined as frontline at the maritime industry. Considering that the crews are employed on contract bases for a definite time they need to be changed on regular basis. Sustainable crew changes are essential not only for the safe operation of the vessels but also for the mental health of the crews. Business & Human Rights Resource reported on 9th of June 2020 that seafarers are forced to work with the expired contract as they are unable to disembark the vessels and return home because of lock-down measures implemented by the states. The Maritime industry bodies are requesting the seafarers are to be regarded as key workers and to be exempted from the bans (Business & Human Rights Resource Centre, 2020). It is stating that while some countries are requesting from seafarers a test report before arrival, some are requesting 10 to 14 days quarantine after disembarkation. For example,

the Maritime and Port Authority (MPA) in Singapore has issued a guideline on how to facilitate crew change (Conrad, 2020).

As per the guideline, the crew change is permitted if and only if the requirements are met by on-signers/off-signers. The most important requirements are that on-signers must have a fit-to-travel medical certificate from the home country and must have a negative test result of covid-19 not more than 48 hours before leaving the home country. And the ship is not allowed to leave the port until the off signers board the plane. All those measurements are increasing the pressure on crews. As per the latest seafarer happiness index issued on 4th of May.2020, overall seafarer index is 6.3 in Q1 2020, down from 6.39 in Q4 in 2019 (Chambers, 2020). Similarly, the owners/operators are having difficulties to decide on where and how to embark/disembark the crews when it is unavoidable. Although some countries have started to ease the restrictions for the residents of some countries who are improving their case results, there are still restrictions in many countries. In response to difficulties faced by the owner's, BIMCO, together with the inputs provided by p&i clubs, issued a charter-party clause giving the owners liberty to deviate to another port for crew change purpose if the calling port is restricted to do so (McCulloch, 2020).

Port State Controls / Port Operations

At many ports, port authorities are not allowing the vessels to berth at the port if they visited the ports of prohibited countries within the last 14 days. The permission to berth is only granted after completion of a detailed inspection of the vessel, crews and cargo at the end of 14 days quarantine period. During this inspection, the authority may request the vessels to take further measurements like disinfection of the vessel. For example, In Turkey, General Directorate of Health for Borders and Coasts to whom Maritime Declaration Form of vessels are submitted declared the list of companies who are authorized for vessels' disinfection in case of request. The cost of such disinfection is varying between USD 500 and USD 1,000 depending on the location of ports, the size of the vessels, etc. Furthermore, the port authorities request the all-related documents produced by the shipping agent for berthing / unberthing procedures of the vessel shall be kept in place of Harbour Masters to maintain minimum possible contact with agency personnel. Also, certain amendments are made to facilitate the need for preliminary surveys of the vessels. For example, pre-survey inspections to the Turkish flagged vessels are amended in such a way that it will be performed in two and four months (instead of one- and three-month period). The port operators are also facing difficulties in organising the shifts as labours are scaring from covid-19 and berthing of arrival vessels can not be scheduled properly.

IMPACTS OF MEASUREMENTS ON MARITIME TRANSPORT

The cost of running a vessel depends on three factors: the conditions of the vessel, general tendency in world prices and efficiency of management/operation (Stopford, 1995). The measurements taken against epidemic has effected all three factors in one way or another. But they mostly affected the management/operation cost as taken measurements put more requests on the shoulder of the management. Because they have to facilitate a smooth and safe operation in every condition. Crew changes measurements by itself the most imported factor on cost increase simply because of, need for deviation of the vessel in some cases, 14 days quarantine requirement, need to get a fit-to-travel certificate and negative test results for on/off signers, etc. Disinfection, 14 days quarantine request for the vessels is also increasing the idle staying days and its expenses on top of the cost of disinfection. Documentations and following up the situation of authorities' request/measurements

and complying with them is also increasing the weight of daily work and its consequential expenses. Having on board an inventory of hazardous materials also increases the cost of operation.

The operating cost of a vessel represents the cost of day to day running of the vessel whatever trade the vessel is engaged in. And it has increased since the measurements taken against covid-19. Increase in operation cost of vessels has triggered the balancing mechanism of supply-demand of maritime transport. The demand for maritime transport is declined dramatically in line with the decrease of world trade due to pandemic. Having the same number of vessels fighting to carry lesser cargo than the one in normal market condition, pushed the freight down. The Baltic Dry Index (BDI) is a shipping and trade index which represents average prices paid for the transport of dry bulk materials across more than 20 routes. It is created by Baltic Exchange which is an independent maritime market information provider located in London (Carol M. Kopp, 2020). Figure.2 is showing that the BDI decreased dramatically from 1600 down to 400 between December 2019 and February.2020 while the corona-19 has started effecting the people around the world.

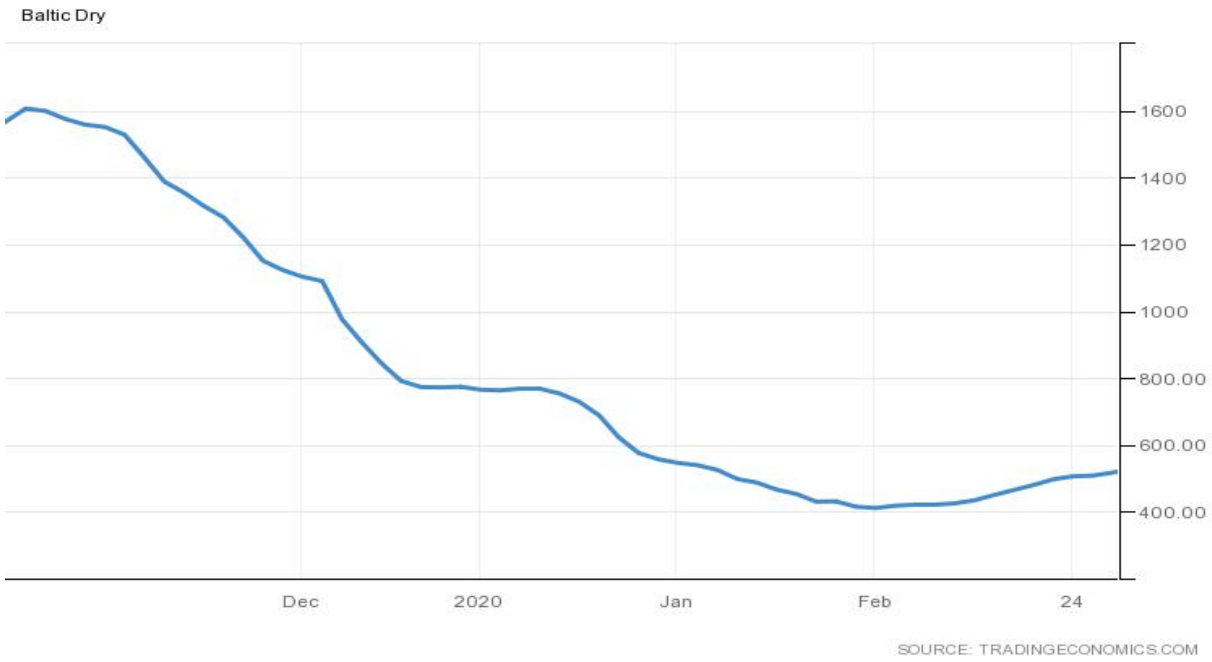


Figure.2 BDI between December 2019 – February 2020 (Trading Economics, 2020)

The market itself finds her way. It just takes time. The decrease in freight triggered the balancing mechanism of maritime transport. The low freight level together with an increased operational cost brings the owners to a junction to decide either to stay in or step back. At this point of time, the owners have a couple of action to take which in return provides a balancing effect on the equilibrium. Şişmanyazıcı (2020) wrote in his article that there are three options for the owners to react when they face a crisis that resulted in a low freight rate. Those are, scrapping, laid up and selling of the vessel. Selling does not change the number of vessels in the market supplying transport service. Therefore, it does not affect the supply side of the maritime transport as it refers only change of ownership. He further commented that during this unpredictable time, most of the

owners prefer laying up the vessels as a shirt term precaution instead of scrapping with a very low price. There is hot and cold lay-up which refers to the duration and accordingly the required conditions of staying idle. Simply, hot lay-up represent shorter stay of idle with less number of crews on board. This provides an easy return to the market when the demand tends back to increase. On the other hand, cold lay-up means a longer stay of idle with almost no crew on board. Although this choice is more favourable in terms of running cost during layup, the owners need more time to reactivate the laid-up vessels. But, both lay-up options provide an adjustable balancing effect on the supply side as laid up vessels can be supplied back into the market in short when the freight is at an acceptable level. It is reported that 15 per cent of the bulk carriers and containerships of world fleets were out of play in maritime transport and more than 11 per cent of the container fleet was idle by mid-June (Lloyd's Register, 2020).

As shown in Figure.3 below (SAFETY4SEA, 2020), demolitions between January–march 2020 was totalling 6.1 million DWT which is 62 per cent more than the figure for the first quarter of 2019. Yet, it was just the beginning of the negative effects of covid-19. This was more due to high fuel prices and additionally poor market conditions. Since the beginning of the pandemic, many owners are now looking to the possibility to send their ships for demolishing. But, the measurements taken to avoid the further virus spreading around the world, is making it hard to find shipyard for demolition.

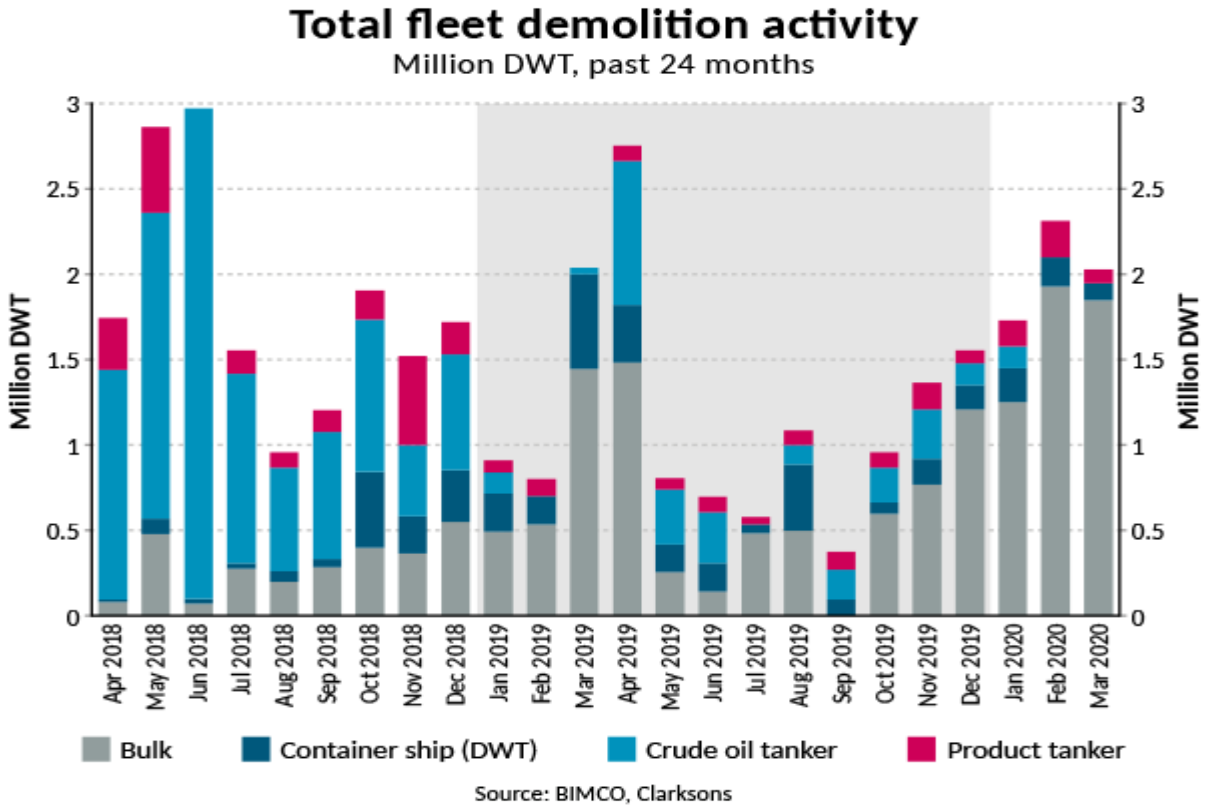


Figure.3 Total Fleet Demolition Activity (April 2018 – March 2020)

The scrapping of the vessels reduces the number of vessels from the supply side for sure and overcoming the shortage of supply takes longer as it takes one to three years to build a new vessel.

The contracting for a new building was following the same pattern as the demolition. It started decreasing before the covid-19 and after pandemic becomes worse. As shown in Figure.4 below, during January – March 2020, new building contracts were only totalling 6.6 million DWT (dropped 55 per cent from the first quarter of 2019) mainly covering three major shipping segments. It represents a sharp decrease compared to the figure of 14.7 million DWT last year.

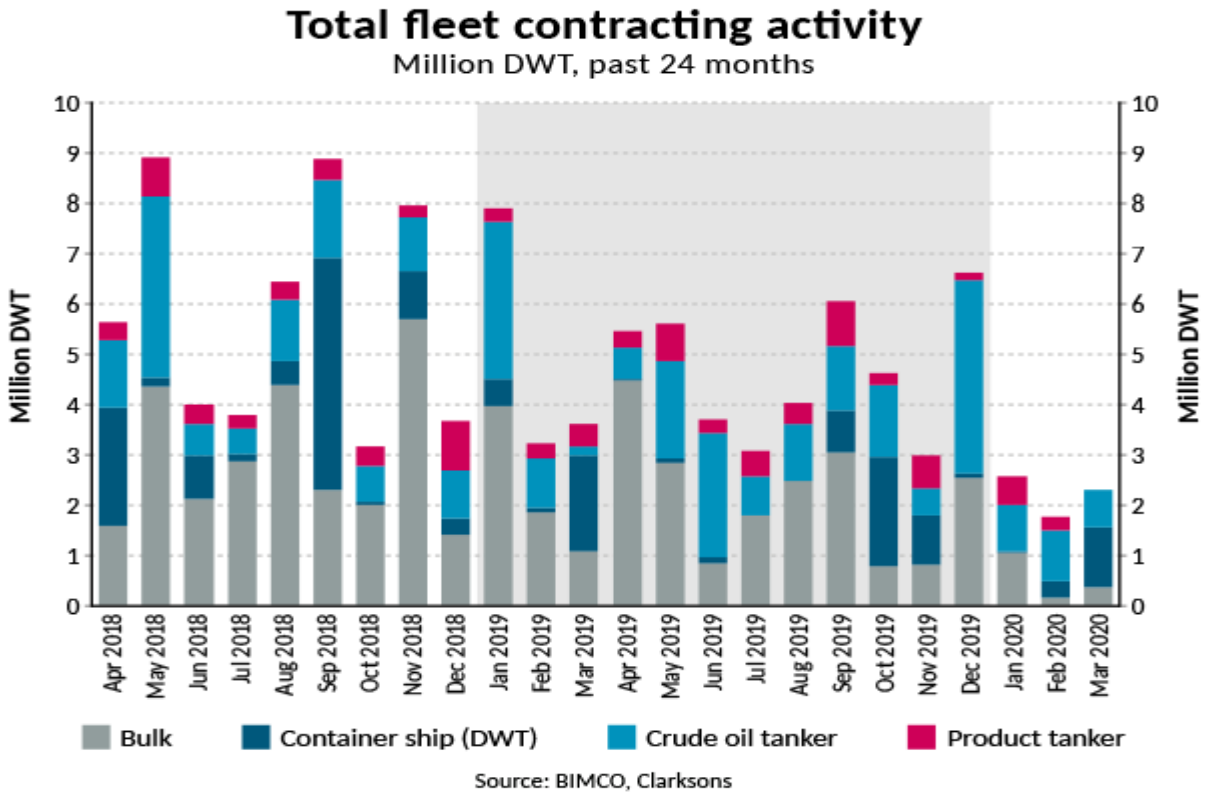


Figure.4 Total Fleet Contracting Activity (April 2018 – March 2020)

The decreasing number of vessels supplying service for maritime transport has a positive effect on freight rates. As shown in Figure.5 BDI has gone up 50 per cent from the beginning of February up to end of March 2020.

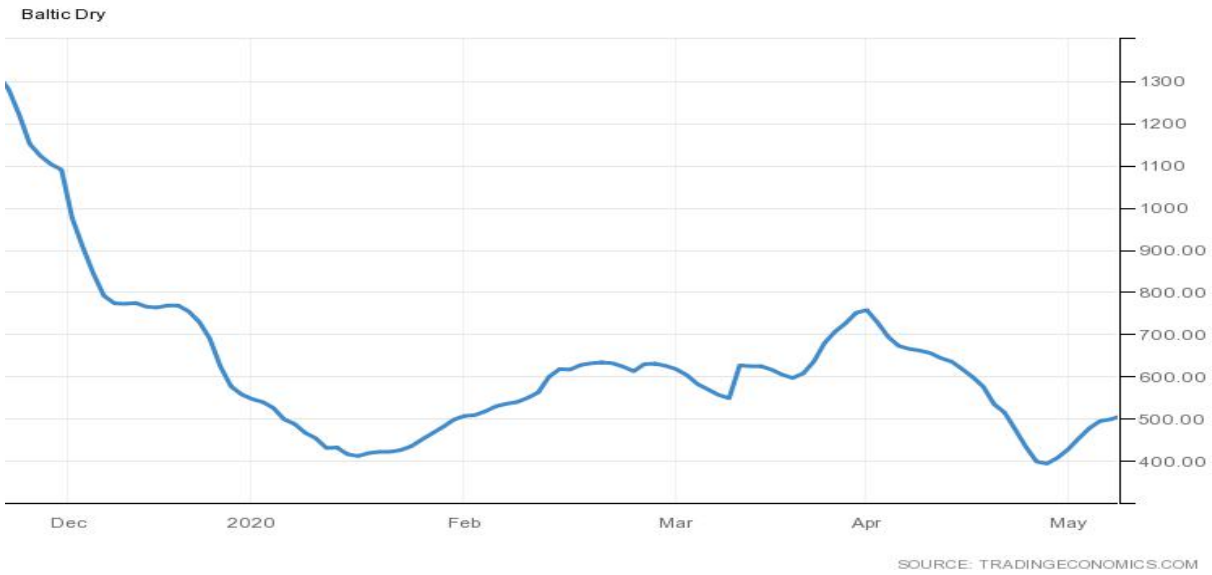


Figure.5 BDI February-March 2020

This tendency is expected to be same through all of the year 2020, as the number of vessels is decreasing from the supply side of maritime transport. On the other hand, due to easing the measurements supported by increasing demand from China, the world trade volume has started picking up from its previous low level. Figure.6 is showing the overall picture of the maritime transport cycling resulting from the balancing of supply-demand.

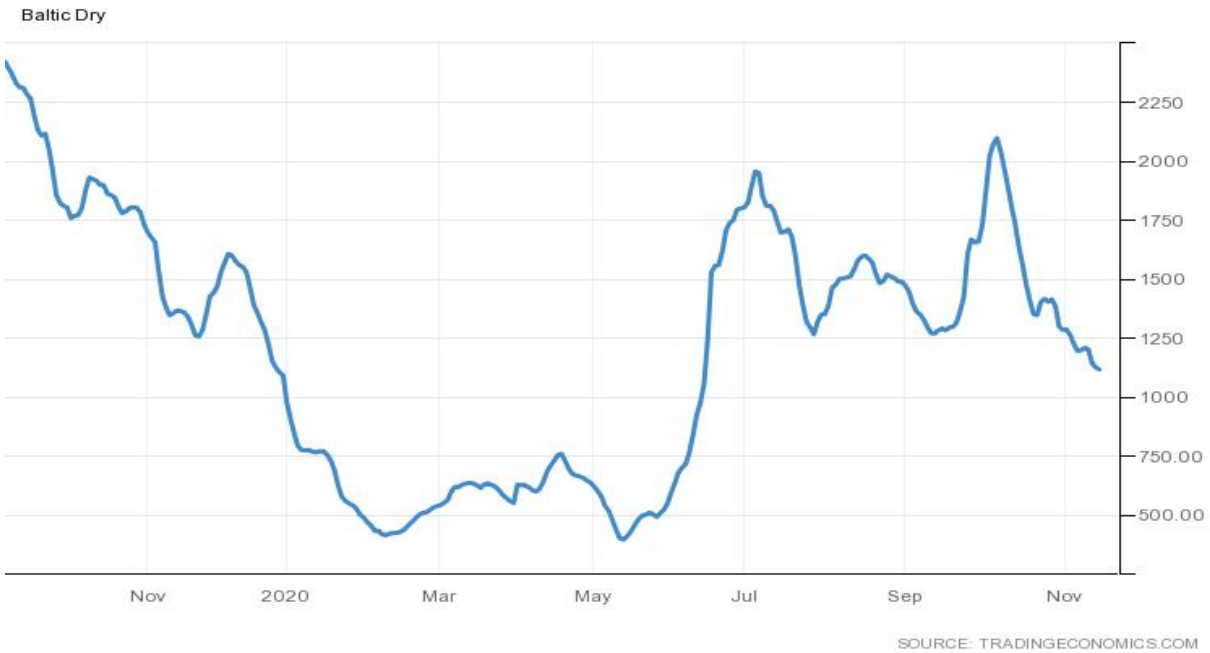


Figure.6 BDI November 2019–November 2020

Last, innovations must be carried on in all branches of logistics in order to be be more agile and to adapt to the rapidly changing word. Reseach and Development budgets' weight must be increased to diminish the fragility (Akkartal, 2019).

CONCLUSION

The development of maritime transport reflects the development of the world economy and trade activity. Because, as per UNCTAD, 80 per cent of internationally traded goods are transported by sea. After the pandemic, the global trade values dropped 3 per cent in the first quarter of 2020. As per UNCTAD forecast, the downturn is expected to accelerate. Moreover, UNCTAD is producing Free Market Commodity Price Index (FMCPI) of UNCTAD which measures the price movements of main exporting commodities of developing economies, reported that the prices fell by a record figure of 20 per cent in March 2020 (UNCTAD, 2020).

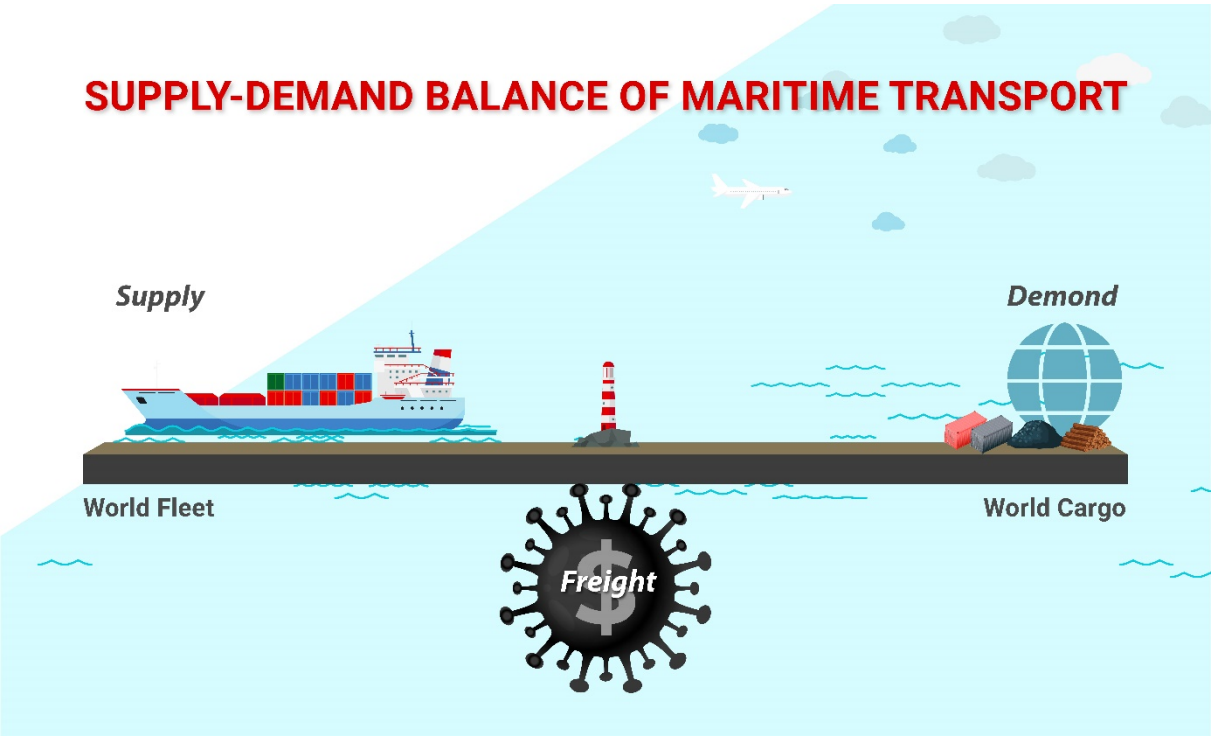


Figure.7 Balance of supply-demand in maritime transport

In line with the decrease of the world economy and trading activity, the epidemic has also affected both the demand and supply side of the maritime industry. 98,140 vessels totalling 2.06 billion of DWT which represent the supply side of the maritime industry has been corrupted since pandemic as 6.6 million DWT new building contracts at the beginning 2020 has just been offset by the demolition of 6.1 million DWT. Leaving the balance of supply rest on the lay-up decision of the owners. Lay-up decisions is a sort of initial reaction to sudden shocks from the demand side in both ways. Although it provides owners to absorb first slumps, it still burdens some costs to owners running cost and reactivating time and cost

Vessels are expensive, long-life assets which push the owners to carefully consider all relevant facts adequately to base their successful business decisions. The demand is volatile, quick to change and not easy to predict. The supply, on the other hand, takes time to react. Therefore, in the shipping market, there is a significant time-lag in adjustment. "*The forward progress of the shipping market is a case of the tortoise of supply chasing the hare of the demand*" (Stopford, 1995, p. 63).

Operating environment plays a critical role in the supply side of maritime transport. When the ability of world fleets to provide transport of global trade inhibited, as it is the case with the current pandemic, it reduces the supply of vessels both in terms of the number of vessels and real transport capacity due to delays. UNCTAD and IMO called governments to provide coordination with related bodies to identify and remove any unnecessary regulations and measurements which will help post-pandemic recovery and by which the maritime transport will be facilitated better in these difficult times (UNCTAD, 2020).

The fact is that the world was faced in the past and will continue to face in the future disruptions in world trade and relatively in maritime transport from different reasons. It could be another pandemic or global warming or a third unforeseen catastrophe that we have to fight against altogether. Covid-19 has reminded us that we all have a common fate (R. Yakoub & El-Zomor, 2020). Therefore, we should be prepared for such disruptions first by working on understanding the possible effects and probable measurements to be taken in advance. This research is aiming to serve this common purpose by looking at the assessment of reaction to measurements in maritime transport. This will also help researchers to analyse more deeply the interrelations of factors affecting the balance of supply-demand.

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