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**” Container freight rates,
maritime transport costs
and
their impact on trade and prices”**

Supervisor

Ch.mo Prof. Paolo Costa

Assistant Supervisor

Ch.mo Prof. Mario Volpe

Graduand

Francesco Burigana

Matriculation Number 883004

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Abstract

With this thesis we want to describe the current phenomenon, which has been dragging on for almost two years, of the increase in tariffs on maritime transport and analyse its possible impact on trade, prices and inflation. We will analyse the causes, starting from the first lockdown with the various disruptions on the supply chain and then moving on to other structural problems of international maritime transport and logistics. We will therefore try, according to the recent literature available, to understand the consequences that this prolonged increase in transport costs would have on the general economy, especially how much it would impact in terms of inflation. Finally, we will look for possible solutions that national legislators and international organisations could stimulate and adopt to prevent these sectoral costs from threatening the global recovery. We will observe the various investment and regulation interventions adopted in some of the most important countries of the international trade involved in these increases in transport prices and by one of the greatest historical crises of the supply chain.

Introduction

Since the first half of 2020 we are witnessing a big change in the daily port and naval activities which would shortly thereafter cause a drastic increase of the maritime freight rates due to the appearance of several problems in the transports and logistics processes.

The source of these sudden landslides is linked to the public policies applied to deal with the covid 19 pandemic and the consequent economic and social trends that would occur in the following years.

We had in 2020 a first lockdown in a great piece of our world. Although the modalities, the countries and the moments of the restrictions on movements and works are been different, we could assist to a big contraction on the demand of goods, a big contraction on the labour force available, a big contraction in the production and so a decrease in number of vessels put in place by the companies to recover some cost.

With the reopenings and the fast recover of the economy in the second half of 2020 the maritime companies, the port operators and all the subjects along the trade routes faced with the problem of a sudden and big demand of transport of goods with insufficient fleets, non state of the art infrastructure to deal with this high traffic and many kind of logistic problems along the routes. Especially among these, of primary importance is the shortage of empty containers, that during the supply chain disruptions found themselves stuck in places where there was not so high demand, occupying precious space, and lacking in places where they were needed.

To complicate the situation we can add the asymmetry in the reopenings and in the stops of the activities due the crisis pandemic between countries based on the different regions' emergency trends, which caused big waves of cargoes suddenly.

This big issues in the transport and logistic world become of primary importance nowadays for the overall economy, because, the phenomenon just described, resulted in an incredible increase in the transport freight rates that are pushing the global inflation with big damage for the collectivity: it increases export/import prices as well as production and consumer prices and so worst it threatens the global economic recovery.

It is also destroying the global supply chains¹ with goods or semi-finished products that are not arriving or that arrive with enormous delays damaging the production, inflating again prices and putting in big risk several companies. Not to miss in fact several examples, also between big companies, that had closed for some period establishments for shortage of raw materials or products. For these reasons several businesses are trying to shorten the supply chain, searching for suppliers in nearer countries or bringing some plants to the home country.

The growth of transport prices are linked mainly to these different problems: the availability of ships and their capacity; the capacity of ports and other infrastructures to move fastly up and down the bigger cargoes of vessels; the capacity of infrastructures in the hinterland to move all the goods traded; the problem of logistics due to different trends of the countries and the interruption of the flow of containers leaving empty containers to the ground and missing of these where they needed; and the speculation that maritime companies, logistics and transport operators are doing thanks to their oligopolistic position.

Said that, the policy maker faces several aspects to tackle this phenomenon that slow the recovery. One of these is the regulatory framework of the carriers to put a ceiling price on their services, to dictate clear rules of behaviour to be adopted on the market or to improve the competition in the sector. Also improving and enlarging the

¹ It is important to distinguish global markets, i.e. the distribution in the world of consumers and raw materials that determine the flows of international commerce, from global supply chains, i.e. the distribution of production phases around the planet based on where the production factors are cheaper. The first is a more structural feature of international trade which can only evolve in the long run; the second is more temporal, the chains can change more or less quickly according to the needs of the manufacturing companies. Here, this second characteristic of global trade has been undermined by the pandemic period and it is now questioned by companies due to its insecurity. So we talk about “nearshoring”, “backshoring” and “reshoring”. Therefore the companies are thinking of shortening these long chains, bringing the activities closer or changing their location, placing them on more accessible routes currently. However, this process is still evolving and still to be verified; we will therefore leave to other studies the verification of the eventual effective fulfilment of this phenomenon and its real quantification.

infrastructure related with international trade and so putting high strategic investments in place (financing problem), it could open up areas of greater competitiveness thanks to more spaces to create supply in the sector. Then other long view and long term policies to enlarge fleets and modernise ports in a sustainable way, to encourage the shortening of the supply chains and of the routes, when it is possible and appropriate for the general economy, for strategic or environmental issues, encouraging innovation also (United Nations Conference on Trade and Development [UNCTAD], 2021).

CHAPTER I

Why has maritime transport cost soared?

From mid-2020 we have seen an unprecedented increase in prices in container and cargo transport by sea. This phenomenon determined by various factors connected to pandemic dynamics, but not only, is creating additional costs for businesses and consumers: impacting on prices and therefore on the purchasing power of families; on costs and therefore on margins for companies. Not only that, even paying prices up to ten times higher than the pre-pandemic for container rent, delays and the lack of raw materials are on the agenda among companies². So let's get to know the main reasons that have pushed the price of maritime transport so high in the last two years.

1.1 Supply chain disruptions

According to Notteboom and Pallis (2020), the biggest crisis in the shipping sector since 2008/2009 occurs in 2020 with the advent of the Covid 19 pandemic. They described this crisis precisely and divided it into different phases.

The first phase is made to coincide in the first quarter of 2020, with the first lockdown in China which resulted in a shortage of available personnel, a slowdown in the

² We specify that the disruptions in logistics, due to the lack of transport at that time and place, is one of the causes of the increase in prices in the transport market, due to the lack of supply compared to demand. Instead, the disruptions in production are an effect of the former. In this case companies could lower the demand for transport due to the slowdown in production, thus reducing transport costs.

production and transport of the Asian giant (Notteboom and Pallis, 2020). Therefore, a slowdown in Chinese supply and demand could be observed, which will lead to a shortage of products in the West and a massive use of inventories (Notteboom and Pallis, 2020). Then the second phase takes place from March 2020 onwards with the lockdowns that also cover the Western world and lead to a crisis in demand (Notteboom and Pallis, 2020). The port and transport sector constitute a derivative demand: therefore the contraction in demand for goods and services immediately drops that of transport, even if, as we will see, the margins of shipping companies and terminal operators have remained quite good despite a big drop in volume (Notteboom and Pallis, 2020).

According to the data of the interviews carried out by Notteboom and Pallis (2020), in Europe the negative peak of container vessel calls was reached in the nineteenth week of 2020, this means at the beginning of May; while in the Americas the negative peak of the effect was delayed between the twenty-first and twenty-fifth of 2020, so between May and June, and then gradually rose again.

From week 19 also the procedures to be carried out before mooring began to decrease, allowing faster access to the port and greater efficiency in operations: in fact, 90 percent of the ports surveyed no longer requested additional measures for container vessels and other cargo vessels from week 21 (Notteboom and Pallis, 2020). While during the acute phase of the restrictions, on the other hand, ships had to be supervised in many ports by doctors who boarded or during the mooring or off the quay to give the ship the go-ahead³; moreover to slow down the operations there were some impositions that forbade the crew to go ashore or only for strictly necessary tasks; even the activities related to the ports went into natural suffering, for example the truck drivers lined up to make anti covid tests or there was a lack of manpower for the widespread quarantines and symptoms (Notteboom and Pallis, 2020).

³ To specify that: the prolonged wait at anchor can increase the transport costs for the additional costs of labour, fuel, missed orders for lost time, etc. However, it is different if time is lost in the port where also demurrage costs could rise due to excessive time spent in the operations carried out in the terminal.

In the third period we are witnessing the recovery of the transport sector with the reopenings but with global demand still uncertain for some countries still under restrictions or with the persistence of the epidemic as in Brazil and India (Notteboom and Pallis, 2020).

The fourth phase is characterised by a boom in demand due to the reopenings and economic recovery that will cause the supply, of both goods and transport, to be unprepared, causing delays, slowdowns on the logistics chain and disproportionate increases in transport prices and in the most scarce goods (Notteboom and Pallis, 2020). After that, with the following winter and during 2021, as well as witnessing an improvement in the situation that was hoped with an adjustment of the supply chains, the phenomenon of the increase in transport costs and the logistics crisis will worsen due to new lockdowns, logistical problems and asymmetries between the various countries. Especially this "accordion effect"⁴: that creates sudden waves of containers, not easily manageable in ports and infrastructures, accustomed to other volumes and not prepared for these extreme circumstances, has created the logistical crisis we are talking about in ports.

In 2022, the problem seems to persist although there may be temporary indicators of improvement based on geographical areas and the health and economic trends of individual countries.

But another non-positive indicator regarding the global supply chain is that rollover rates in the first months of 2022 have risen despite the decline in demand and production: this could signal the fact that global chain destruction, transportation schedule changes and blank sailing are still largely present along major routes (Longhin, 2022).

⁴ By "accordion effect" we mean the trend of container flows in this case, which from small quantities due to the stoppage of activities suddenly pass to high quantities due to the instant reopening of companies and the free movement of people. At a later stage, there could be a drastic drop in flows due to new lockdowns and a further successive wave of containers, once the supply of the exporting countries is unblocked or the demand of the importing countries is reactivated.

However, the war in Ukraine, the new lockdowns in China and pronounced inflation do not offer a short-term solution to the crisis in the supply chains or to the increase in transport prices⁵.

So much so that new solutions are being found: pushed digitization of services for better coordination, reshoring and nearshoring of activities to avoid the risk of new supply chain interruptions, search for new routes and infrastructural improvements in ports and in the hinterland.

1.1.1 Little supply in the maritime transport sector

Traditionally in maritime transport there was some overcapacity on the fleets of the companies, but since two years the situation has dramatically changed⁶ (UNCTAD, 2021).

⁵ It is then necessary to distinguish in a further analysis the effects and causes that each event entails on trade and inflation.

The new lockdowns in China reflect the trend of the phenomenon we have witnessed in the last two years: "accordion effects" in global supply chains that create their own disruptions with consequent price increases (cost inflation). As a second consequence it can have an effect on production and trade but the demand has remained high during this phenomenon despite these difficulties. It could be an indicator that transportation costs have had little impact on inflation in major world markets. The war in Ukraine has instead had a much more direct and significant impact on inflation due to the increase in many essential raw materials including gas and oil (inflation from energy costs) which propagate their price increases over much of the economy, at least as far as the European Union is concerned. We therefore have a great impact on prices in this case but probably also on trade with the affected areas.

⁶ It should be noted that in the maritime sector in recent years there has been a profound structural transformation both from a technological point of view both from a market composition (II Post, 2021). From a technological point of view, shipping companies have created ever larger ships to exploit economies of scale more and more. But they have created logistical problems for terminal operators due to the large quantities of containers to be managed at the same time; they have stimulated

With the first lockdown and the big reduction in production and trade in the first half of 2020, the liner shipping companies had to manage cost cutting on the capacity and so on the fleet (UNCTAD, 2021). Indeed, with the reopenings of the activities and the sudden expansion of demand, the smaller ship capacity was not able to handle all the requests. Even worse, the demand appeared very fast and very huge for the global economic recovery, immediately after the lockdown.

To make matters worse, in all the global supply chain were registered delays and logistics problems due to the asymmetry in the lockdown of different countries and activities, that withdrew other transport offers from the trade due to ships waiting for bottleneck delays, including ports.

In particular in 2020 we are witnessing a 12 per cent decrease in ship deliveries and a growth of the global fleet of only 3 per cent, a very low number compared with the past years (UNCTAD, 2021). Especially in the year in which the demand had a huge jump in the second half and just when the many disruptions in the global supply chain would ask for more means.

This inevitably impacted freight rates; they experienced a long-term surge causing additional costs to exporters and importers as well as to production. Costs that would have passed on to customers, slowing down the economic recovery and increasing

pressure on the infrastructures involved; jeopardise strategic points of commerce in the event of an accident; they take away flexibility and resilience from supply chains because they cannot dock in all ports; consequently they also penalise some destinations and some companies that import or export (II Post, 2021). In March 2021 there was an increase in orders for boats by 15,000 TEU instead of the largest which exceeded 24,000 TEU, also because companies are evaluating higher risks in case of accidents (II Post, 2021). Experts say that we cannot continue to increase the size of the ships because we are reaching heights where the winds impact the most on the containers and widths that make the ship difficult to manoeuvre (II Post, 2021). From a market point of view, there has been a concentration that has led ten companies to control 80/90% of global traffic. In particular, technological progress has made companies with the availability of mega ships prevail on the market, wiping out the smaller ones, effectively creating an oligopoly.

These factors have also affected the current global under capacity of fleets.

inflation⁷, plus the damages on the production side caused by delays in supplies of products and raw material.

Interesting also that for the environmental targets of decarbonization and the aim of zero emissions, IMO suggest that one simple and very fast measure would be to reduce the speed of the ships: that would mean to expand even more the global fleet to maintain the volume and the time delivery acceptable; also many new ships will be ordered to reply to the old one and respect the new environment limits (UNCTAD, 2021). All these needs of expansion in the supply of maritime transport will require huge investments and time. Even more, the liner ship companies that operate in an oligopolistic market will act based on their best interest.

Therefore it would be desirable that the public authorities also indicate the path of tariff, environmental and industrial policies as clear as possible in the sector, favouring long-term investments necessary to better face the growing demand for transport, by regulating the sector to meet both economic and environmental needs. Then adjusting infrastructure adequately for the demand required.

In China the Government has direct control in the ship building sector that is considered strategic: in 1982 the shipbuilding ministry was corporatized as the China State Shipbuilding Corporation which now administers most commercial and military shipbuilding (UNCTAD, 2021). This government support allows China to detain in China

⁷ In the second chapter we will review the main studies to understand how sea freight rates and port tariffs have been able to impact inflation. However, it is important to remember that the inflation we are experiencing today has several causes. Not only that, the causes and proportions of the various components of inflation vary considerably from country to country. For example, here we would like to analyse only the inflationary component of maritime transport costs, excluding it from the others. So we are talking about cost inflation. However, current inflation also has other causes at the same time. In the United States, for example, inflation has been driven a lot by the surge in demand, so here we're talking more about demand inflation. In Europe we have pronounced inflation, stimulated by energy price increases, hence cost inflation, from energy in this case. The inflation of maritime transport costs therefore presents itself as a further piece of the increase in prices, quantitatively probably in a lower way than the others mentioned above and perhaps more temporary than expected given the drop in freight rates in 2022.

40 percent of global ship building (UNCTAD, 2021); it is a strong power to influence global trade and to use this control to better serve its political and economical interests. But this can affect trade and freight rates only by increasing or decreasing the hold supply. However, the Chinese hold offer is relevant but not decisive for global trade.

So in the rest of the world, without taking direct control of pricing and production of the maritime transport, at least a strong and far-sighted regulatory framework is required for the interest of all the countries, the general economy and the environmental aims.

To understand the recent crisis of supply in the maritime transport sector we could see how between January 2020 and January 2021 the new orderbooks has declined of about 16 percent: with bulk carriers down of 36 percent and ferries down of 32 percent, instead were registered good performance for liquified gas carriers (+10%) and general cargo ships(+6%) (UNCTAD, 2021). The path of decline of the global new orders has been going since 2011: in January 2021 touched the minimum point for the combination of Covid pandemic, uncertain policies for the future energy sources and finance constraints (UNCTAD, 2021).

At the beginning of 2021 the demand for new vessels started to change, rising a lot thanks to the global recovery and the several constraints in the global chain. In the first half of 2021 the new orders were at a very high level, the record since 2014, with the highest order for Panamax container ships and good increase in LNG carriers (UNCTAD, 2021). Recycling ships instead continue to grow also in 2020 (+44% of tons sold) (UNCTAD, 2021). Companies prefer this solution instead of new ships due the lower investment needed and the high uncertain market for covid 19 in 2020, despite the cost to manage old ships could be higher (UNCTAD, 2021).

But in the next future with new changes in the regulatory framework to cut emissions, companies will be constrained to make important investment decisions to replace old fleets or to retrofit old ships with new technologies to make less pollution and spend less (UNCTAD, 2021). It is assessed in 0,2 trillion the investments to respond only to the growth in demand for transport in maritime, but 2,19 trillion to replace and retrofit the fleets in the next 30 years (UNCTAD, 2021). For these reasons companies ask for clear intentions from the authorities to understand how to deal with new capacity (UNCTAD, 2021).

However the capacity for maritime transport has decreased in the last two year of 6% about (Ship Mag, 03/02/2022).

If we consider that 80% of the global trade is carried by sea we can immediately understand the problems that this kind of shortage of supply in the maritime sector and this increase of transport price could and are causing around the world. Raw materials, semi products and products that do not arrive or arrive with several delays, factories that have to interrupt or reduce the production, surge in the large part of prices and so a reduction in purchasing power of citizens and tighter margins for companies. In the first half of 2020 was registered a decrease of operating vessels of about 69% compared to 2017, and a decrease in port calls of 17% in the second quarter: so these numbers reflect a serious impairment of the maritime transport system that would have generated the problems which we are still seeing today (Toygar et al., 2022).

Subsequently, with this explosion in the demand for transport, of course, the shipping companies began to make huge investments to expand their fleets, thanks above all to the incredible extra profits of recent years. 2021 and 2022 marked record numbers for the sector. In 2021, 1286 ships were ordered (+ 32.6% on 2020) of which 561 container ships (107 in 2019 pre pandemic) (Gerboni, 2022). It should be noted that most of these will be built in Asian shipyards (Gerboni, 2022).

In 2022, on the other hand, 239 container ships were already ordered in the middle of the year, with an order book of 27.9% compared to the capacity in the water: it was 8.2% in 2020 (Helvetius, 2022). The numbers also confirm that we are returning to focus on medium-sized ships: Neopanamax from 13 to 15 thousand TEU and those that will replace the old Panamax from 7 thousand TEU and beyond (Helvetius, 2022). The risk is that these ships will arrive once the demand curve has already changed but is part of the sector game, according to some experts, however, a critical threshold of too many ships has already been exceeded (Helvetius, 2022). However, some advantages could be that of having an updated and adequate fleet for the new environmental regulations that will come, including if speed limits were to be imposed on some types of vessels, there would already be more ships needed to guarantee the service.

1.1.2 High demand

Maritime trade fell of 3.8% in the first half of 2020 less dramatically than expectations (Manaadiar, 2021).

During the covid 19 period demand shifted more from services to products, especially those of health and care sector in particular to tackle, prevent and control sanitary emergency and office equipment to work and study from home; instead demand for services decreased especially during the restrictions (Manaadiar, 2021). So the maritime transport sector did not fall as much as expected initially from the global pandemic. Even more, maritime trade increases its proportion on the global GDP ratio (Manaadiar, 2021).

Another reason is that the restrictions arrived in different times and uneven manners so that demand has always persisted in some regions, also during forced lockdowns in others. More, there are to consider a lot of basic necessities whose flows have never stopped and could not have been interrupted.

Then, since the second half of 2020, when the recovery started to take place, the transport sector began to increase faster, reaching pre-pandemic level in 2021 (Manaadiar, 2021). In particular in the third quarter 2021 the demand pace increased remarkably and the trade in goods reached record levels while services trade stayed still a little below pre pandemic levels (Manaadiar, 2021).

Indeed UNCTAD (2021) states that global trade in 2021 should register an increase of 23 percent upon 2020 reaching the record of 28 trillion dollars (Manaadiar, 2021).

This leads us to think that the end of globalisation has not come. Global markets are there and remain. However, a relocation and intra-regionalization of trade can be expected; but the location of raw materials and demographic characteristics will pivot on the future geography of trade, thus limiting the choices for restructuring global markets. Furthermore, maritime trade remains a major component of it. Another aspect to which the experts seem to give credit is a relocation of the production phases and supply chains but it is a phenomenon that is still in the making. Therefore the globalisation of the markets will probably not die out but will reshape itself while the change of location of the production phases is still to be evaluated.

1.1.3 Oligopolistic market and extra profits of liner shipping companies

The nine biggest liner shipping companies over ten in the world control 84.6% of the container market because they stay in three big alliances: 2M, Ocean Alliance and The Alliance (Manaadiar, 2021). This limits a lot the competition in the sector and it allows big speculations in case of little supply just like now.

Traditionally the industry does not guarantee huge profit, rather the margins were few with many companies engaging in many losses, for this reason the profits for 2021 of the container ship companies are amazing (Manaadiar, 2021). At the end of 2021 the forecasts for the year were 150 billion of profit for container shipping companies, in 2020 were 25,4 billion: an increase of 491 per cent (Manaadiar, 2021).

Maersk Line, the second biggest container shipping line, has reached 17 billion of operating profit against the 4,5 billion expected at the beginning of the year (Manaadiar, 2021).

So we can well understand the disproportionate profit of the sector and the damage that this brings to the whole economy.

We want to underline that the increases in transport costs are not only of a speculative nature but there is also this component. It is interesting to see some data that show the incredible leap in the results of the shipping lines. The operating profits, EBIT, of the container shipping companies were \$ 1.6 billion in the first quarter of 2020 but in that of 2021 were \$ 27.1 billion (UNCTAD, 2021).

As Notteboom et al. (2021) well explained, even in the first half of 2020 the Shanghai Containerized Freight Index remained, incredibly, higher or stable than in previous years⁸ despite the Chinese lockdown and the contraction in demand to historic lows.

⁸ Data from the Shanghai Containerized Freight Index, China Containerized Freight Index and the Drewry World Container Index seem to confirm that there have been no large swings on average in the first half of 2020 compared to previous years; while all three confirm the surge from the second half of 2020 (MacroMicro, 2022a; MacroMicro, 2022c).

This fact can be explained by the fact that some structural changes⁹ have occurred in the sector since the 2008/2009 financial crisis (Notteboom et al., 2021). One of them was the wave of mergers and acquisitions of 2014/2015: that made it possible to manage the fleet capacity very efficiently by the companies (Notteboom et al., 2021). Other factors that made it possible to contain costs and increase margins were the reduction of new orders, the scrapping of additional ships, the much lowered price of the fuel bunker and the systematic use of blank sailing to optimise operation¹⁰ (Notteboom et al., 2021). Even a very permissive regulation that allows shipping companies to manage capacities as they see fit, has allowed for good cost management, perhaps to the detriment of senders and recipients (Notteboom et al., 2021). The Asia-Europe route saw 36% sailings less due to the rearrangement of naval capabilities (Notteboom et al., 2021). This, compared to other crises, has made it possible not to witness a sharp decline in the utilisation rate of vessels, maintaining freight rates stable and even an improvement in operating margins in the first half of 2020 (Notteboom et al., 2021). The shipping companies have also implemented online services to update and better track orders, also in the warehouse, to reduce costs and increase flexibility (Notteboom et al., 2021).

It should be added that the increase in the size of ships in recent years has improved the economies of scale of these companies; and a reduced price of fuel during the first lockdown has contributed significantly to the improvement of the results, with ships

⁹ It should be noted that the new IMO (International Maritime Organization) regulation is in force since 1 January 2020. This has a maximum level of sulfur in the oil fuel of 0.5% compared to the previous one of 3.5% (IMO 2020). This has required companies additional costs for purchasing greener fuels, new filters and investments in new technologies (DB Shenker, 2020). This may have kept freight rates stable in the first half of 2020 instead of dropping them due to the decrease in demand. However, in that period also the price of oil dropped a lot so this remains only a hypothesis. Certainly instead the fact of the concentration in the maritime market in recent years which has allowed a different management of capacities and costs.

¹⁰ Oligopolistic practices of supply reduction and its discretionary management (blank sailing) to avoid decrease of prices and low the costs, that added to the low fuel prices in that period, allow maritime companies to maintain good margins.

even circumnavigating the Cape of Good Hope thanks to a low oil price and higher loads in megaships. This opportunity was also exploited in 2021 with the case of the accident in the Suez Canal of the Ever Given which caused delays and considerable economic damage for the operators.

After the first lockdown in 2020, with the recovery of demand and the easing of measures, blank sailing also decreased but the fleets were understaffed to meet the demands of the market; the increase in tariffs was a direct consequence of this scarcity of supply.

As Notteboom and Pallis (2021) argue, the shipping companies are now finding themselves with a significant financial strengthening which they could take to strengthen the fleet, even if it takes years. Above all, greener fleets to meet the needs that will be posed by the new regulations (Notteboom et al., 2021). Furthermore, they could opt for an expansion of the portfolio by focusing on more regional fleets as the restructuring of global supply chains will also lead to a “nearshoring” and a “reshoring”¹¹: therefore more intense naval activity there could be in the short range (Notteboom et al., 2021). Finally, other investments are hypothesised in a vertical integration to have the entire shipping process under control: from the management of logistics to that of infrastructures to be increasingly efficient and effective in their orders (Notteboom et al., 2021). This could entail additional risks of monopolies and oligopolies along the chain which may not guarantee the optimum for the general economy and

¹¹ The reshoring of the production phases will depend on the strategic choices of the individual companies after the risks of long chains seen in this period. Some regionalizations are in fact already underway but mainly due to other causes. As previously mentioned, globalisation is not disappearing but it could reshape itself. This depends on geopolitical factors that determine the change or the intensification of relations with other economies, they can be temporary or not. Then it depends on geo-economic factors, the latter more structural and determined for example by demographics, income level and location of raw materials. For example, we are witnessing an intensification of commercial relations in the Indo-Pacific area due to the great demographic and economic growth. Therefore, a regionalization of trade in this area is in effect mainly due to structural reasons rather than the reorganisation of supply chains. Even the Mediterranean could see a growth in its regional traffic but in a more distant horizon, based on the development of the African continent.

other stakeholders if not regulated by public authorities at best (Notteboom et al., 2021).

In particular, as argued in the International Transport Forum (2022), two characteristics of the maritime market structure appear to have facilitated the current logistical crisis. On the one hand, the growing market concentration of shipping companies and their alliances meant that these companies covered almost all of the global geographic space and related lines, thus making it much more integrated than before (International Transport Forum [ITF], 2022). If on the one hand this has made it possible to achieve greater efficiency in shipping companies, on the other hand it has meant that any problem localised in one point of the world has repercussions in other areas of the world: a local problem now more often becomes global, therefore we have more rigid and less resilient chains (ITF, 2022). While before there were many smaller companies that divided up different zones, less efficient and integrated perhaps, but they allowed more flexibility and kept the problems at a local level (ITF, 2022).

The second point was that this concentration has allowed for easier management of fleet capacity: this is also positive for shipping companies but not always for customers (ITF, 2022). This fact has led to cost savings for shipping companies but inconvenience and additional costs for freight forwarders. For example, the shortage of supply in 2021 was also marked by a cut in the capacity of the previous year, to maintain prices and reduce costs (ITF, 2022). Many small exporters found themselves disadvantaged because they were more dependent on spot rates and overshadowed by larger orders (ITF, 2022). Furthermore, the result of these manoeuvres was also the increase in freight rates on routes where the demand had not varied so much, but for the movement of ships on the most profitable and needy routes, they too had to suffer high prices and lack of supply (ITF, 2022). Without considering the risks of speculation and unjustified profits that such an oligopolistic market entails: the profits of 2021 also lead to this explanation.

1.1.4 Empty-container shortage

The problem of empty container reallocation has always been present in the maritime shipping sector but with the supply chain disruptions due the covid 19 measures the phenomenon exploded (Toygar et al., 2022).

In maritime trade there is some asymmetry based on the fact that not all countries export and import the same volume of goods, and also not from and to the same country (Toygar et al., 2022). So there is a logistic issue to bring empty containers to countries where there is more need, for their higher export rate than their import rate (Toygar et al., 2022).

For example China is the biggest exporter of the world and the second largest importer; its need for empty containers is very high, those that arrive full deriving from imports are never enough (Toygar et al., 2022).

With the lockdown measures, the missing of workforce, the interruption of some production and the lower demand on trade we assisted at the disruption of the global supply chain and, with it, the crumbling of the system for placing empty containers.

It occurred for many reasons. One of these is the higher delivery times due to the shortage of labours and lockdown measures that have caused congestion in ports and in the main logistical nodes with many empty containers waiting in ports, warehouses and shipboard (Toygar et al., 2022).

Another reason is that shipping lines increase blank sailing and changes in shipping schedule to avoid the most congested ports or to optimise the reduced activity of unloading and loading of cargoes (Toygar et al., 2022). Therefore this too has contributed to blowing up the usual route of empty containers. This prevented the arrival of the empty containers where they were needed; the result was an excess of containers that took up space and increased costs and times in the ports of the countries with greater import, and shortage of containers where countries exported more (Toygar et al., 2022).

These effects also lasted the following years. In 2021, indeed, in the main routes of Transpacific and Asia-Europe it was registered a huge number of blank sailing for 919

container ships¹² (Toygar et al., 2022). This has produced many problematic effects on the logistics of empty containers with heavy consequences on transport prices. Only in the first three quarters the container freight rates increased almost five times in the US-China route and more than doubled for Europe-China (Toygar et al., 2022).

To remedy the problem for instance, the French company CMA CGM started paying \$ 300 for each empty container returned within four days at the points indicated (Pincio, 2022). This incentive system aims to put around 43,000 empty containers back into circulation according to estimates (Pincio, 2022). This is an example of how companies have adapted to new medium-long term circumstances in order to continue to ensure a system that is as fluid and effective as possible (Pincio, 2022).

Another issue that broke the balance of daily activities on the global supply chain for 2020 was the urgent need for medical masks and devices, largely manufactured in China (Gamio and Goodman, 2021). Therefore a large number of vessels from China were directed all over the world even in previously less frequented routes and in countries with little trade with it (Gamio and Goodman, 2021). Also in this case a large number of empty containers were therefore left in ports around the world, such as West Africa (Gamio and Goodman, 2021).

1.1.5 Other factors of the surge rates

Also the production of containers decreased in the first quarter of 2020 together with the decrease of maritime trade; already in 2019 the production was slowing (Hillebrand GORI, n.d.). So when the economy recovered in the third quarter this exacerbated the shortage of containers (Hillebrand GORI, n.d.). Together with containers, shipping lines decreased the number of operating vessels to contain cost with the beginning of the pandemic.

Furthermore there was a big export jump in China (+21%) in November 2021 against last year, so this implies an even bigger need for containers.(il Post, 2021a)

¹² It should be noted that the phenomenon of blank sailing has first of all caused a total disruption of the reliability of transport, making delivery times completely random and making the normal routes of many goods skip.

Currently another problem in sea transport is that not all ships travel at full capacity because to avoid the most clogged ports they carry out the so-called blank sailing (Bridgett, 2022). This implies not carrying out all the calls and therefore not taking charge of all potential orders. Therefore, the United States is considering taxing ships that do not leave completely full or reasonably taxing empty containers on ships, bearing in mind that they also serve in international trade (Bridgett, 2022).

Interesting the analysis that puts Fontanelli (2021) at the centre, focusing on some structural issues that together with the conjunctural ones have caused "the perfect storm" (Fontanelli, 2021). Fontanelli (2021) highlights the imbalances of trade balances, that is the disproportion between goods that go to China from the United States and those in the opposite direction, as well as those of the US-Europe route and those of China-Europe route and the opposite path. These routes have an enormous imbalance in volumes, which in itself makes the balance of the transport sector precarious to remain efficient; with the pandemic crisis, the equilibrium has completely jumped (Fontanelli, 2021). The question therefore posed would be that while the pandemic measures will disappear in the short-medium term, the structural ones risk not finding a solution except in the long term (Fontanelli, 2021).

Also to be considered detention fees and demurrages for delays and extra time spent in port in the increase in transport costs. As UNCTAD (2021) points out, these cost components have doubled between 2020 and 2021 and resulted in a cost of \$ 666 per container on average. Furthermore, the shippers, given the reduced supply in the hold, concluded negotiations in a hurry and with surcharges to secure a place in the hold (UNCTAD, 2021).

On the other hand, with limited availability in the hold, the shipping lines have given priority to larger and long-term expectors, cutting out the smallest ones (UNCTAD, 2021).

1.2 Port congestion

Also during the first half of 2020 we could assist at an increase of port congestion paradoxically (Notteboom and Pallis, 2021). The shipping lines to reduce cost and optimise operations try to push larger vessels and less port calls so that the pressure goes on only some ports infrastructure that have to handle bigger cargoes at one time (Notteboom and Pallis, 2021).

Port congestion was one of the main factors causing the increase in container freight rates and freight costs.

As Hariesh Manaadiar (2020) claims, a port can be blocked for various reasons: arrivals beyond maximum capacity, strikes, wars, epidemics, lack of adequate or functioning infrastructures, unfavourable weather conditions, geographical position, trade wars. Recently, with the pandemic, we have witnessed a real logistical crisis within the ports and in their hinterland which has caused unprecedented delays, congestion and in some cases has also highlighted the fragility of port systems (Manaadiar, 2020).

Since the Eighties the container circle has only increased, requiring more and more capacity and speed in the unloading and loading of ships stopped in ports so as not to cause queues (Manaadiar, 2020).

Significant stress for the ports was the increasing size of the container ships which ensured large economies of scale for the container shipping lines, but huge changes and investments were required from the ports to deal with these new vessels (Manaadiar, 2020). Even now many ports are innovating to be able to face this challenge. A technical problem of no small importance is the fact that the new mega ships have increased the width and height much more than the length, not allowing a simple increase of cranes along the quay to carry out loading and unloading (Manaadiar, 2020). Therefore with an increase in the loading volumes it was not possible to proportionally increase the number of cranes to keep the loading and unloading speed constant (Manaadiar, 2020). In addition, megaships require larger container yards, more goods handling at the same time, for example more trucks circulating at the same time in the port or in the interport, longer trains and larger stations, creating a chain effect that requires huge infrastructural investments to be able to deal with these new kind of transport

(Manaadiar, 2020). Many ports are not ready for these changes and there is a decrease in productivity and congestion (Manaadiar, 2020).

Trade wars also cause logistical problems as some goods could remain in the ports due to the change of conditions or impossibility of departure if we talk about sanctions (Manaadiar, 2020). Conversely, you can see a sudden increase in orders just before the penalties to get the goods to their destination before the new rules are triggered. We have seen these phenomena both with the China-United State trade war and with the recent sanctions on Russia.

Countries with an unbalanced trade balance also often suffer from port congestion (Manaadiar, 2020). That is, in countries that import more than they export, they find themselves with port areas submerged by empty containers that prevent new ones who arrive full from being stored (Manaadiar, 2020). This is the case of the port of Manila in the Philippines where it reached a peak of 8000 empty containers in 2019 (Manaadiar, 2020).

With the pandemic, congestion of ports has become a recurring problem due to the continuous lockdowns that blocked and unblocked the activities in an abrupt way, the lack of workforce, the misallocation of containers, the many blank sailings, the lack of vessels and containers and the additional health control measures that slowed the work (Manaadiar, 2020). Pandemic also accentuated the pre-existing vulnerabilities in ports. The final problem with these delays at the port is the increased costs that someone will have to pay (Manaadiar, 2020). First of all, there will be an increase in demurrage and detention fees¹³ because the goods are stationed more in port (Manaadiar, 2020). After that there will be an increase in the prices of external operators, for example the trucking companies that have to make their truckers wait at the port spending more on labour and wasting time for new orders (Manaadiar, 2020). Hence, prices will rise again here as well. Wasted time is another important factor that can lead to costs for companies that do not see the raw materials and semi-finished products necessary for

¹³ Demurrage, are those fees that are applied by shipping companies for the use of the terminal space in more days than submit.

Detention fees concern the use of equipment or empty containers.

their production arrive on time (Manaadiar, 2020). In the end, the consequences could be paid by manufacturing companies or by consumers on the final price.

1.3 Zero Covid China Policy

The Zero Covid China policy implemented in these years and praised by the whole world for its ability to contain the virus and therefore to guarantee a faster economic restart and freedom of movement, now it no longer seems to be so effective. Leaving out the contagion aspects in which also China is now experiencing great difficulties of containment but which are not the subject of attention here, we focus on the protection of Chinese and global trade. The recent example is given by the Shanghai lockdown that in the last months has greatly worried the operators of the sector and the entire world economy which has already experienced what the slowdown in port activities means, especially those in China where the repercussions at the level of global trade are higher (We Build Value, 2022).

In recent months in Shanghai, a city of nearly 30 million inhabitants, which represents 5% of the country's GDP, has witnessed a lockdown which has effectively suspended the production activities of many multinationals and companies (We Build Value, 2022). The same fate befell the ports and airports which, although remaining open, had to drastically decrease their activity due to a lack of manpower and longer customs control measures (We Build Value, 2022).

Shanghai is the largest maritime terminal in the world therefore its participation at a global level becomes essential for the arrival of raw materials necessary for example for our infrastructures that we have set ourselves to build and for many strategic assets for industry and for the people (We Build Value, 2022).

The 20% of the world porta containers it was in the roadstead in Shanghai port, during April 500 ships a week were out of the port waiting for authorization and the average time of stay of the ships in port increased from 5 to 12 days (We Build Value, 2022).

The problem with this funnel effect that occurs in Shanghai as with every lockdown, once again, in addition to damage to production and customers, could be an increase in transport prices.

In fact, last year with the health emergency in the port of Shenzhen which resulted in a reduction in activities of over 70% for a week, the impact was significant: the ocean tariffs of the United States and Europe with China had increased by 20% (Helvetius, 2022).

At the moment (April 2022) it does not seem the case with the tariffs appearing to have remained fairly flat, also considering the suspension of many activities in Shanghai and the alternative ports sought by the ships (Helvetius, 2022). However, with the reopening of all activities at full capacity there could be increases in the tariffs of container transport (Helvetius, 2022).

Moreover, the experts affirm that as soon as the activities in Shanghai and all over China will fully resume we will find ourselves with the logistic problem in the western ports (PneusNews, 2022). A flood of containers will invade our ports so it would be good to organise the European transport and logistics players and infrastructures better by involving all the stakeholders to avoid penalising our companies and consumers with further price increases and delays (PneusNews, 2022).

1.4 War in Ukraine

Even the recent conflict in Ukraine did not help the general crisis in supply chains: many Ukrainian ports are now blocked by water mines or ongoing conflicts (Allianz Global Corporate & Specialty [AGCS], 2022). The workforce is engaged in the war and in any case the shipping companies have suspended services and activities in Ukrainian ports (AGCS, 2022). Furthermore, sanctions with Russia have caused further blockages in the movement of containers to and from Russia (AGCS, 2022). All this is increasing the inflationary spirals and the lack of raw materials, so much to get to talk about a food crisis, if tens of millions of tons of food goods lying in Ukrainian ports and countryside will not be unlocked (AGCS, 2022). This could be an additional geopolitical advantage for Russia in the peace negotiation.

So we find ourselves with entire corridors by water blocked like the Black Sea, but also the junctures by land are now impracticable: in Ukraine due to the war and in Belarus

due to blocks, congestion and sanctions similar to those imposed on Russia (AGCS, 2022).

Among the various sanctions, ships flying the Russian flag cannot enter European and English ports, which contributes to the reduction of the world fleet available and therefore to the lack of supply in maritime transport, as well as decreasing the supply of various products to and from Russia (Shipping and Freight Resource News Desk, 2022). The three main shipping companies (MSC, Maersk and CMA CGM) will no longer call at Russian ports (Braw, 2022). Only the Chinese company COSCO will be able to continue to supply Russian ports (Braw, 2022). In March, 140 merchant ships were blocked in Ukrainian ports due to the risks involved in moving (Braw, 2022). On the other hand, countless container ships around the world do not know where to leave the products that had to arrive in Russia and thousands of containers have piled up in the ports without being able to leave, worsening their congestion (Braw, 2022). The question is who will bring these containers back and who will pay (Braw, 2022). All of this creates even more havoc in the already proven global supply chain. Another problem is the repatriation of seafarers and it is not known how to pay the Russian ones who represent 10% of the world's seafarers, plus 4% Ukrainians (Braw, 2022). If Russia were to take this manpower away from shipping, the entire global chain would be instantly blocked (Braw, 2022). All this shows how global trade is interconnected and maritime transport is the main tool to ensure the proper operation. So in a world where companies operate freely but where states set borders in times of conflict and prioritise national interests, the economy will also have to rethink a restructuring of supply chains, shorter and safer, perhaps more ecological and competitive if inventiveness and intelligence allow it.

1.5 European and Italian freight rates

In Europe, the increases in freight rates were evident starting with the reopening after lockdown. If in June 2020 the Shanghai Containerized Freight Index spot rate counted \$ 1000 per TEU on the Shanghai-Europe route, this figure had quadrupled by the end of the year (UNCTAD, 2021). Despite an expansion of the capacity of the container carriers

by approximately 3% after the first quarter of 2021 (Clarksons Research, 2021a, quoted in UNCTAD, 2021, p.60), in July 2021 this price exceeded \$ 7,000 per TEU (UNCTAD, 2021).

Also according to the Shanghai Containerized Freight Index in June 2021 the Asia-North Europe route marked \$ 6,300 per TEU, but going into individual cases you could find companies that had to spend \$ 20,000 to export a container of 2 TEU (40feet) from Shanghai to Rotterdam (Ship Mag, 2021a).

There have been large increases in all European routes: both those directed to northern European ports and the Mediterranean ones, with a slightly more pronounced increase between 2020 and 2021 in the former being hubs of greater attraction for efficiency and infrastructure (Ship Mag, 2021b). According to the World Container Index drawn up by Drewry in November 2021, the Shanghai-Rotterdam spot freight rate was between \$ 13,000 and \$ 14,000 per FEU (+ 442% in a year); Shanghai-Genoa between \$ 12,000 and \$ 13,000 per FEU (+ 324% in a year) (Ship Mag, 2021b).

Despite this, we are witnessing a reversal of the situation with Mediterranean freight rates which in recent months have been surpassing those of northern Europe (Shipping Italy, 2022a). In 2022, spot rates between the Far East and Southern Europe fell less abruptly than those in Northern Europe (Shipping Italy, 2022a). So that in April 2022 the freight rates for 40-foot containers (2 TEU) on the Far East - Southern Europe route amounted to \$ 13,100, against \$ 11,100 on the Far East - Northern Europe route (Shipping Italy, 2022a). This is probably due to the increase in flows for the more attractive prices that the southern ports had. Indeed it is estimated to be only a temporary phenomenon, as European ports are close enough and operators can move around according to convenience, rebalancing prices; also, southern ports do not have the capacity of the northern ports to sustain a higher demand in the long term (Shipping Italy, 2022a). Long-term freight rates, on the other hand, remain more expensive for those in Northern Europe: \$ 8,000 FEU (that is the measure for a 40 foot container that equal 2 TEU) compared to \$ 7,000 FEU if you arrive in Mediterranean ports (Shipping Italy, 2022a).

Another reason for these more consistent flows in the ports of Southern Europe is also the recent shift of freight transport by land, which previously took place by rail between China and Europe via Russia (Shipping Italy, 2022b). Now due to the war in Ukraine and

the sanctions in Russia it cannot come by here (Shipping Italy, 2022b). These loads therefore flow into the maritime mode, increasing the demand for transport, the congestion and the increase in freight rates (Shipping Italy, 2022b).

The European Commission also questioned why freight rates had risen so high despite the fact that European container demand had remained fairly stable and ports suffered far less congestion than that of America or China (ITF, 2022). An answer would seem to come from the International Transport Forum (2022) which highlights how the great freedom of management of shipping companies has moved a lot of fleet capacity on the Far East-US West and East Coast routes, as they are much more profitable and much more on the rise thanks to the surge of US demand, following favourable monetary and fiscal policies. This resulted in a shortage of ships for European routes and therefore an increase in freight rates (ITF, 2022).

In Italy in these two years of the pandemic freight rates have increased, albeit a bit less significantly than in large Northern European ports such as Rotterdam and Antwerp (De Forcade, 2022a). Italian ports have faced two years of great challenges and for the future they will have to make important investment decisions in order to not miss the opportunities of the great changes that are taking place in the sector: mega cargoes, digitalization, ecological transition and a return of the Mediterranean at the centre of global geopolitical and economic life.

However, congestion has been considerably reduced in Italian ports if we compare them to European ones; a note that could sound positive but which in reality is a bit of a hint of our marginality compared to the large European ports despite our favourable geographical position (De Forcade, 2022a).

Raoul de Forcade (2022a) highlights how for a round trip of a container ship on the Far East - Europe route the average duration was 81 days in pre pandemic age.

But in November 2021 the duration of the trip already counted 17 more days, and in May of this year instead of decreasing it counted 20: probably this due to the war in Ukraine and the lockdowns in China (De Forcade, 2022a).

Thus also sea freight rates continue to grow despite the drop this spring: the annual variation on the main world routes marks a + 25%. Specifically, we can note (De Forcade, 2022a):

*"Rotterdam-New York (+ 102%); Los Angeles-Shanghai (+ 73%); Shanghai- Los Angeles (+ 55%); Shanghai-New York (+ 48%); New York- Rotterdam (+ 33%) and Shanghai-Genoa (+ 23%). The only exceptions: Rotterdam-Shanghai (-8%) and Shanghai-Rotterdam (-1%)"*¹⁴(De Forcade, 2022, "Noli ancora alle stelle").

Italy could suffer particularly from the increase in transport prices due to its characteristics as a transforming country and with large portions of imported raw materials (IlSole24ore, 2022). There is also another deficit in our country, namely the increasingly lower share of Italian carriers in the global market, this implies an unfavourable balance on merchant transport with large portions of wealth that are not only taken away from productive companies but which for the more they end up in foreign economic entities (IlSole24ore, 2022).

It is estimated that between 2002 and 2020, between 3 and 7 billion euros per year left the beautiful country for transport reasons (IlSole24ore, 2022). In 2021, due to this disproportionate increase in freight rates, the Italian transport deficit reached a record of 10.9 billion euros (IlSole24ore, 2022).

1.6 Los Angeles and Long Beach-Shanghai container freight rates

As the journalist Longhin (2022) reports, also in 2022 in American ports we are witnessing a logistic crisis of a similar type to those of the past two years. On one hand the cost of transporting a 40-foot container from China to the US west coast was falling from \$ 20,000 to \$ 15/16,000 says Rollero, vice president of Anfia components, at the beginning of may (Longhin, 2022). But the fact is that before the pandemic these prices were around \$ 3,500, and now with the Chinese lockdown that will result in a whiplash on the global chain, new bottlenecks are expected that will again imply an increase in transport prices by ship (Longhin, 2022).

¹⁴ De Forcade, R. (2022), Congestione dei terminal e noli alle stelle ma i porti italiani crescono, Il Sole 24 Ore, 22/06/2022

These effects will spill over to European and American ports, the biggest effects are expected in Los Angeles and Long Beach (Longhin, 2022). For example, the companies here are renting disused airports to store products, especially cars that sometimes have to wait for single pieces of little value necessary to complete the vehicle (Longhin, 2022). The port of Los Angeles had just made up for the delay accumulated in recent months: from 109 ships queuing to land in January 2022 to 30 that now are waiting (Nappi, 2022). An enormous job that in future will require an organisation capable of anticipating events.

However, the structural limits will not prevent that new flooding of containers could congest ports around the world (Nappi, 2022). Now that Shanghai has departed, Chinese companies will import more to restart production while Western ports will have a wave of backlogs that will arrive all together (Nappi, 2022). Not to mention that companies increasingly tend to get ahead with orders, already stocking materials for the autumn and winter season (Nappi, 2022).

To give an idea of the previous logistical effort that these ports have been required to face, just think that in 2021 Los Angeles, the main port of the United States, handled 10.7 million TEU, up of 16% compared to 2020 (Nappi, 2022). Long Beach, the second most important port, with a similar growth has enlivened 9.38 million TEU (Nappi, 2022). All this with irregular trends in transport flows and sudden waves of containers (Nappi, 2022).

The situation on the American coasts is improving in the first four months of 2022 (Shipping and Freight Resource , 2022b). In reality, this easing on the ports is dictated by somewhat unfavourable indicators: in fact, thanks to the declining demand caused by inflation and the Chinese ports operating at a reduced rate due to the new covid outbreaks, the American ports have been able to clear up some of the backlogs (Shipping and Freight Resource , 2022b).

This explains why travel times on the China-Los Angeles and Long Beach sea lane were reduced from 50 days in December 2021 to 27 days in April 2022 (Shipping and Freight Resource , 2022b). A little worse is the situation on the East Coast where many cargoes have been diverted to avoid the more clogged ports of the West Coast (Shipping and Freight Resource , 2022b). Waiting times have increased at the Port of New York but a

delayed improvement is expected when the effects of the lockdowns in China will arrive, usually after the west coast (Shipping and Freight Resource , 2022b).

Improvements between January and April, in the times of exit from the ports instead, are noticeable both on the East and West Coasts (Shipping and Freight Resource , 2022b).

Consequently the spot rate of containers has also dropped drastically: an estimated 7-8 thousand dollars for a 40feet container in the route China-US West Coast and 9-10 thousand dollars for the China- US East Coast in April 2022 (Shipping and Freight Resources, 2022b).

Richter (2022) noticed that:

“From Shanghai to Los Angeles, container freight rates fell by 30% from the peak of \$12,424 in September 2021 to \$8,704 in the week ended June 2. But they’re still over four times higher than they were just before the pandemic.

From Shanghai to New York, container freight rates dropped by 33% from \$16,138 at the peak last September to \$10,871 as of June 2”¹⁵ (Richter, 2022, “Supply chains improve from catastrophically stressed to just very stressed”).

The fact remains that the price keeps significantly higher than the pre-pandemic period and it remains to be seen how US ports will deal with further stresses in the future. In fact, now the summer season begins, which always involves an increase in orders (Richter, 2022). We will also see the unblocking of Chinese ports and activities that will lead to a new filling of the ports.

Even in Shanghai, the wait in port remains much higher than in the pre-pandemic period: 31 hours of waiting, but more manageable than the impressive 80 hours of August 2021 (Richter, 2022).

This traffic jam in US ports is also due to the fact that, in particular in the period 2021, there was a very pronounced growth in demand in the United States (Richter, 2022). Thanks also to the central bank and the government aid, there has been a strong growth

¹⁵ Richter, W. (2022), Container Ship Wait-Times at Shanghai Fall, Still High. Container Freight Rates Drop, Still 4x of 2019: Stabilization of Supply Chain Pressures at Historically High Levels, Wolf Street, 06/06/2022.

(Richter, 2022). Especially, the durable goods sector has seen disproportionate growth with a peak that was reached between March and April 2021 (Richter, 2022).

1.7 Structural factors

UNCTAD (2021) points out that beyond this exceptional period that has been extending for two years, other structural factors affect transport costs and affect countries in different ways according to the degree of development and the geographical location. For example, to serve the most distant countries, companies will increase the cost of fuel and fleet (UNCTAD, 2021). However, if the countries in question have large volumes, they will benefit from economies of scale (UNCTAD, 2021). Smaller and less developed countries therefore risk staying out of global trafficking or to reach it with higher costs (UNCTAD, 2021). Therefore, the smaller economies will have a greater impact on the cost of transport and on the value of the goods in general (UNCTAD, 2021). Indeed, these could face some structural problems to suffer less transport price increases, also to mitigate the prolonged effects of this crisis on supply chains caused by the recent lockdowns (UNCTAD, 2021).

UNCTAD (2021) points out, for example, that the cost of transport weighs more on landlocked developing countries than the rest of the world, due to the more expensive types of transport they have to use: land or air.

Always the Union Nation Conference on Trade and Development (2021) considers infrastructures, sea connectivity and trade facilitation as structural factors; and estimates that if you improved your position from the 25th percentile to the 75th percentile in the quality of port infrastructure, you would decrease costs by 4.1%; in trade facilitation by 3.7%; and in shipping connectivity by 4.4%. But if we looked for example only at least developed countries, the improvement in trade facilitation would involve a reduction of 8.6% in the cost of transport, while by only 0.7% in the case of infrastructural improvements (UNCTAD, 2021).

In general by intervening on the structural factors for a smooth commercial transport, UNCTAD (2021) foresees a possible benefit of 4% on the cost of maritime transport.

Commercial asymmetries also create additional costs for transportation. For example, high-demand countries that trade with low-demand countries find themselves with extra containers to bring back empty and occupying space in ports, warehouses and holds requiring higher costs (UNCTAD, 2021). The UNCTAD (2021) estimates that an extra 10% imbalance in trade between two countries causes a 0.3% increase in costs. And it shows how, for example, an increase in volumes of 10% can reduce costs by 2.6% thanks to economies of scale (UNCTAD, 2021).

CHAPTER II

How and how much freight rates and transport cost surge impact on inflation and trade?

In the second chapter we will address the impact that this increase in transport shipping prices is having on consumer prices and trade. So we will review the main studies that try to estimate how much these supply chain problems and these surcharges impact on inflation and trade. Recalling that companies are also being penalised with higher costs and therefore erosion of margins; as well as they are being damaged for missing orders and less productivity due to lack of raw materials or those arriving with long delays.

2.1 Damage of Freight rates

UNCTAD (2021) points out that if the increase in transport prices continues over time, as it is actually happening, this will impact on the economic recovery and on consumer prices.

In 2021 despite an expansion of fleet capacity, there has been a further increase in freight rates, fees and surcharges (UNCTAD, 2021). This is due to an ever-expanding demand, slowdowns in ports, uncertainties in supply and navigation programs becoming less and less reliable.

Already in 2020 some products, those highly demanded during the first lockdown, have undergone stronger price increases than others, especially computers, furniture and pharmaceutical drugs (UNCTAD, 2021). In 2021, the increase in prices touched many raw materials for the industry. Now in 2022 inflation is generalised for many different reasons: inflation from demand especially in the US; inflation from costs such as that from high freight rates or oil price; inflation from costs due to energy and gas prices increase as we are now dramatically experiencing. So shipping cost is one of these reasons, but obviously disparities remain based on the type of goods, level of integration in the global supply chain and characteristics of the import-export countries.

UNCTAD (2021) simulation predicted a 10.6% increase in the import price and 1.5% in the consumer price in mid-2021 due to increases in transport costs. Without considering the asymmetry in economic damage: for example in small island developing states, that are more dependent on maritime transport and far from main routes, import prices could see a surge of 24% and the consumption price by 7.5% (UNCTAD, 2021). More or less the same fate would be for the least developed countries that will suffer the most from these increases (UNCTAD, 2021).

To understand the extent of the phenomenon, in the third quarter of 2021 the spot rate for transporting a container weighed on average 19% of the goods value while in the first quarter of 2020 it was only 3% (International Transport Forum ,2022). While the growing difficulties in having the goods arrive on time has in fact made the "just in time" approach impossible for companies that import, increasing the tendency to stockpile and increase the size of orders (International Transport Forum, 2022) .

2.2 UNCTAD: the impacts on prices and trade 2021, a simulation

The fact that these increases persist in container transport will inevitably have repercussions on import prices and subsequently on consumer prices (UNCTAD, 2021). Unless companies want to absorb all the additional costs, this is a remote possibility, especially when these increases are now structural and not occasional, consumers will

pay for these increases with inflation and/or reducing consumption according to difference in price elasticity.

The delays, on the other hand, slowed down production and caused the companies to lose orders; while the excess costs, if absorbed in whole or in part, erode the margins, if passed on to customers they could decrease volumes.

Through a simulation, UNCTAD (2021) tried to calculate the possible effects on prices of these continuous freight rates increases, highlighting the problem.

First of all, it should be noted that this cost increase does not affect all countries equally. Those who are most dependent on trade and most dependent on access by sea pay the most (UNCTAD, 2021). Even on products, the increases do not strike in the same way, in addition to those imported on the most congested routes, it will be those most inserted in global supply chains that will suffer: intermediate goods produced through delocalization will affect the price of the final goods (UNCTAD, 2021).

Understanding these consequences is crucial to understanding how much this phenomenon can hinder global recovery and damage the overall economy.

UNCTAD (2021) raises the question of how the impacts affect the countries in different ways. First of all to pay are the Small Islands Developing States (SIDS): economically weak countries highly linked to international trade and which must use maritime transport as the main route of connection; suffice it to say that for these countries, imports account for 58 percent of GDP in 2019 against 21 percent of the world average (UNCTAD, 2021). The United Nations Conference on Trade and Development (2021) tried to apply the increase seen between August 2020 and August 2021 in container transport, namely + 243% of freight rates, for a full year in the global market. The result was a generalised increase in import prices of 10.6% which then spills over to consumer prices for a 1.5% increase at global level (UNCTAD, 2021). The increase in final prices is clearly smaller because imported goods are only a slice of consumed goods (UNCTAD, 2021).

In 2022 container freight rates actually are falling quickly, less 60% from January to September in the route from China to West Coast US (Marine Insight, 2022): from about 10.500\$ to 4.700\$ about according to the Drewry World Container Index (MacroMicro, 2022b). In the route from China to Europe is felt by 42% (Marine Insight, 2022): Shanghai to Rotterdam from over 13.000\$ of January 2022 to 7.500\$ of September 2022 in the Drewry World Container Index (MacroMicro, 2022b). UNCTAD's (2021) hypothesis of

such a high and persistent increase in freight rates for a full year may seem exaggerated. Unfortunately it's not that out of place. We do not have an exact figure but both the Drewry World Container Index (2022) and the Freightos Baltic Index (2022) show even higher increases in container freight rates, i.e. a surge in prices that continued even after August 2021 and then slowly decreased but maintained levels averages much higher than August 2020. If in August 2020 we were at a Drewry container composite index of \$ 2,000, for most of the year from August 2021 to August 2022 we have hovered between \$ 9,000 and \$ 7,000 and only from July 2022 to go below \$ 7,000 that is the threshold of a 243% increase about respect August 2020 supposed by UNCTAD (2021) (MacroMicro, 2022b): therefore an average increase of 243% compared to August 2020 yes, it was achieved for the whole of the following year; however we are talking about spot rates. UNCTAD (2021) was based on increases recorded on the China Containerized Freight Index (CCFI) between August 2020 and August 2021; but also during the following year (August 2021-August 2022) it seems that the freight rates shown in CCFI have stayed on average above the increase of 243% and more than August 2020 (MacroMicro, 2022d).

Also contract rates increase: between May 2021 and May 2022 they indicate an average increase of 150% and especially in all 2022 have increased; in contrast to the general decreasing trend of the indexes of spot rates signed since January 2022, probably because many old contracts expiring have been gradually renewed at much higher prices (SUPPLYCHAINITALY, 2022).

Finally, it would be necessary to check whether the increases recorded in these indices, especially the CCFI considered by UNCTAD (2021), reflect the actual increases on the market taking into consideration all the contracts actually stipulated and already existing to have a clear idea if the estimate of 1, 5% increase in inflation from rising container shipping costs is in line with reality.

But if we look only at SIDS countries we notice a + 24% in import prices and a + 7.5% in consumer prices (UNCTAD, 2021). So an impact much higher than the global average. These represent significant damage to economies that are already less developed.

Clearly the impacts will be lower for countries that use maritime routes less, for example the Landlocked Developing Countries, where the calculated impacts from shipping tariffs surge stop at + 3.2% in import price and + 0.6% in consumer price (UNCTAD, 2021).

The least developed countries would see a 2.2% increase in consumer prices due to more pronounced inflation which transfers all the increases from businesses to consumers, as the changes are often believed by the companies to be permanent (UNCTAD, 2021).

Another variable, however, is the size of the economies in question. The larger ones see less significant impacts because they have more differentiated productions and can reach larger economies of scale (UNCTAD, 2021). They also benefit from greater negotiating power and from the possession of the major shipping companies so that they can have more influence on the routes and on the supplies of goods they need.

Smaller economies also tend to be more open to imports due to the need for raw materials and therefore the impact on prices will be greater (UNCTAD, 2021). Finally, for the same reason, even for domestic processing they need more imported intermediate products than other countries (UNCTAD, 2021). To give an example, an increase in prices due to maritime transport costs in Estonia is calculated of 3.7%, having a ratio of imports to GDP of 60%; while in the United States, where that ratio is 11%, the increase is estimated to be only 1.2% (UNCTAD, 2021).

Other goods more subject to increases would be those with low added value because they tend to be produced in less developed economies located for the most part distant from large international markets (UNCTAD, 2021). Therefore, facing the expensive freight rates for these goods is based on their kind of production and sale path.

It should be noted that these increases accompanied by supply chain disruptions slow down the economic recovery. If we think about industrial production in the US, which in July 2021 was 0.1 percent less than in the pre pandemic period, despite the demand for goods was 14.8% higher, we can understand how the slowdowns in freight transport decelerate and hinder the recovery and the trade, and these price increases decrease they in scope (UNCTAD, 2021).

The growth of industrial production under rhythm respect demand is due both to the slowdown in production due to delays in the delivery of raw materials and intermediate goods that do not allow to satisfy the entire demand promptly, both for the additional transport costs that create lower margins and therefore less convenience, and for the uncertainties on the supply chain which do not allow programming even in investments

, as we said before, causing a slowdown in production due to a lack of pieces, important example the lack of microchips.

Furthermore, the extra demand of the Americans is probably largely satisfied by the Far East, while American exporters unable to load their goods in the holds of ships and in containers, due to blank sailing and the need of spaces for empty containers, may have reduced potential production. It could be a possible answer to the large gap between industrial growth and demand for goods in the US at that time.

2.3 Trade regionalization

These increases in freight rates that spill over to import / export prices, especially low-value goods according to the International Transport Forum (2022) and that can affect the trend of international trade, can also affect the distribution of international trade. As we said previously, the problems that emerged on long chains have led to thinking of a shortening of the production chains. It is too early to assess whether there will actually be an upheaval in the distribution of the production phases, however some recent data can be observed. For example, the International Transport Forum (2022) observed how the market shares of some of the most exported goods in the main global markets have changed in recent years.

First, there was a decline in the share of global Far East exports in some specific sectors (ITF, 2022). Comparing 2020, a year of normal decline in trade for obvious reasons, with 2021 which was a year of general recovery, we see some counter-trends (ITF, 2022). In 2021 the clothing and accessories sectors, specialised machinery, rubber manufactures and mineral manufactures sectors saw a further decline in the export share of the Far East in the global market compared to 2020, despite the economic recovery (ITF, 2022). Sectors that weren't in decline before the pandemic. For example, if we take the clothing and accessories sector, it grew by 2.5% per year in the export market share before 2020, in 2021 instead it witnesses a -2% compared to 2020 (ITF, 2022). This sudden change can hardly be attributed to a loss of competitiveness of the Far East; the International

Transport Forum (2022) therefore goes deeper and notes that the decline in market shares derives from Europe, the Mediterranean area and the United States in a significant way. While Far East export share improves in all other areas of the planet, in particular intra the Far East and in the Gulf and Indian subcontinent (ITF, 2022).

Looking at Europe, it can be seen that: the import shares of clothing and accessories dropped significantly in 2021 from the Far East, instead increased at the same time from other areas in identical quantities (ITF, 2022). In particular, it seems that these quotas have been replaced by Europe with the Mediterranean area and by the Gulf and Indian subcontinent (ITF, 2022). So in this sector, for example, we can say that there has been a regionalization of trade in Europe and also in Asia in 2021; but in other sectors this has not happened and long-term trends in the future will have to be seen to confirm these changes (ITF, 2022).

However, it remains a significant example of how international trade has reacted in the face of the destruction and riskiness of long supply chains, at least in some sectors where the looser constraints of raw material sources allowed it. In these specific cases, more than deglobalization, we can witness a restructuring of markets, more regionalized or simply international trading partners changed on the basis of economic, geographical or geopolitical advantages.

2.4 Internationalisation for Italian firms seems to persist

Some data extrapolated from Studi e Ricerche per il Mezzogiorno (2022), give us some indications on the trends of Italian and southern companies in our country. In particular as regards whether there is a tendency to shorten supply chains or to turn to markets that are closer if not directly reshoring in the home country. Well, the data between 2022 and 2021 do not seem to suggest an ongoing deglobalization process; on the contrary, the internalisation of Italian firms seems to be strengthening and growing in many areas of the world (Studi e Ricerche per il Mezzogiorno [SRM], 2022). Something different can be seen, however, if we look at the data on the Asian market. That is, while

all international markets see a growth in the share of Italian companies that do business with them, the Asian market is the only one that remains stable or even slightly downward between 2022 and 2021 as regards the share of Italian companies doing business with this region (SRM,2022), despite being the one with the most economic growth. This could lead to the hypothesis of a redefinition of world trade, at least partially and perhaps only temporary, which includes the internationalisation of markets but with these more regionalized or with countries more easily reachable in the supply chain, with partners that are geopolitically more reliable and loyal to the nations interested or with allies within the world chessboard. In fact, we see the most pronounced growth of Italian companies' share of that exporting to the member countries of the European Union: a growth from 34% to 45% between 2021-2022 of Italian companies that export to the EU, and to America from 17% to 21% (SRM, 2022). The data on where Italian companies get their supplies are also interesting. At the Italian level, it seems that the percentage of companies that obtain supplies from abroad has not decreased but rather increased (SRM, 2022): it would be necessary to understand, however, whether the suppliers have been partially replaced with others located in countries that are closer or more accessible than the traditional shipping routes involved in the supply chain disruption or if they remain the same.

In Southern Italy, on the other hand, there has been a drastic decline in companies that rely on suppliers located abroad (SRM, 2022).

Obviously these are aggregate data that should be further investigated. For example, some sectors could easily find replacement suppliers but others could not because of the geographical scarcity of their raw materials. Perhaps the rest of Italy or some big industry outside the South has productions more dependent on raw materials which our country does not have and which they can only find in certain countries.

In any case, globalisation seems for the moment to resist the various troubles, but interesting scenarios of regionalization and change of commercial relations are opening up, also for geopolitical issues and perhaps in the future also for environmental reasons.

2.5 Change in modal split

The modes of transport have also seen some repercussions from the increase in freight rates. For example, there was an increase in container traffic along the Eurasian railway and an increased demand for air transport which consequently also had an increase in tariffs (ITF, 2022). Therefore, the too high shipping rates have made other means of transport more competitive, not only for the cost but also for the greater reliability (ITF, 2022). Some companies to get around the problem have even started to internalise the transport phase, so they started to chart container vessels like Walmart or Alibaba did (ITF, 2022). Some have even opted to purchase their own containers such as Amazon and Ikea (ITF, 2022). These new behaviours represent in fact new entrants in the market even if of irrelevant size in maritime transport and will probably last only as long as freight rates remain so high (ITF, 2022).

2.6 How rising shipping costs could impact inflation and what factors matters, an International Monetary Fund analysis

In order to have a clearer idea of the effects of the extra costs of maritime transport, a study was conducted by the International Monetary Fund (2022) which clearly illustrates the situation and the associated risks.

The International Monetary Fund (2022) briefly illustrates the current phenomenon and then through a rigorous analysis explains the effects of the shipping cost on headline inflation¹⁶, core inflation¹⁷, producer prices and import prices. Also interesting because

¹⁶ Headline inflation is the general increase in the prices of all commodities, goods and services, none excluded: it therefore indicates overall inflation and it is more subject to contingency changes in prices (WallStreetMojo Editorial Team, 2022).

¹⁷ Core inflation is the increase in the prices of all commodities, goods and services of a certain economy excluding the most volatile ones: therefore, changes in food and energy prices are removed from the increase because they are among the most volatile ones (WallStreetMojo Editorial Team, 2022). It is more stable and can be useful

historically it seems that inflation from shipping costs has been less examined and monitored than those deriving from oil, metal commodity and food variations (International Monetary Fund [IMF], 2022).

But suffice it to say that in October 2021 container transport costs were 500 percent higher and shipping bulk commodities costs were tripled compared to the pre pandemic levels (IMF, 2022) to understand the risk of repercussions on inflation. On one hand, the increase in demand and the little supply in the maritime sector, on the other hand, the congestion of ports and the scarcity of empty containers, the latter spreading from the Transpacific route to the Europe-North America and Europe-Far East routes because of container shift from the Atlantic to Pacific, emerge as the main causes of a huge surge in freight rates; but also the lack of credibility of the roadmaps and the delays increase the costs of demurrage¹⁸ and detention fees¹⁹ (IMF, 2022).

These increases have a direct effect on import prices that increase proportionally to transport costs and after which, they can have an indirect effect on production prices which, in whole or in part, can spill over to the prices of final consumers (IMF, 2022). This depends on whether the economies or sectors in question are in a competitive market or not: in the first case the firms will tend to discharge the extra costs less on the price in order to not lose customers; in the second they will tend to completely discharge the extra costs to consumers, being the market structure more closed (IMF, 2022).

It is calculated that 38 percent of the GDP in 2018 is based on imported goods and that the value of transport costs weighted for 7.5 percent of the value²⁰ of the imported goods (IMF,2022), therefore it is an important component of the price.

for understanding the general long-term trend more truthfully (WallStreetMojo Editorial Team, 2022).

¹⁸ Demurrage: penalties for extra days of use of the port.

¹⁹ Detention fees: typically penalties for returning the containers after the scheduled time.

²⁰ The International Transport Forum talks about a value of the cost of transport equal to 3% in 2019 and 19% in 2021 of the value of the goods, an amazing increase that confirms the problem discussed here (International Transport Forum, 2022). However, this cost is assumed on the average spot rates and in different years than 2018, so it could be different from IMF (2022) analysis.

After that there can be a further second effect on inflation when we talk about inflation expectations: many contracts rely on current or historical inflation data to negotiate future prices, for example contracts on wages, this could create an additional inflation effect in the future (IMF, 2022).

The study of the IMF (2022) is based on the Baltic Dry Index which measures the average freight rates of dry bulk materials on the main 20 commercial routes: the advantages are the long series of historical data and that it is based on decentralised spot rates so it gives an answer almost in real time, the downside is that it does not include container and liquid cargo freights but it has observed a very high correlation of 0.85 with these types of transport and therefore assume similar conclusions for these too.

They took a sample of 46 countries with monthly data on import prices, production prices, core prices and headline inflation from February 1992 to December 2021 (IMF, 2022).

The IMF (2022) notes that the direct effect on import prices depends also on the ratio of transport cost on the total cost of the good; the indirect effect on producer prices instead depends on how many intermediate goods are imported; the second rebound effect instead depends on other factors such as the monetary policy framework, the anchored expectations on inflation, markups of firms.

As a result we see that all indices reflect in a positive and significant way an increase in shipping costs, albeit quantitatively in different ways. The headline inflation created by these extra costs would appear to gradually increase until it reaches its peak in the 12th month from the shocks and then falls again in the following six months (IMF, 2022).

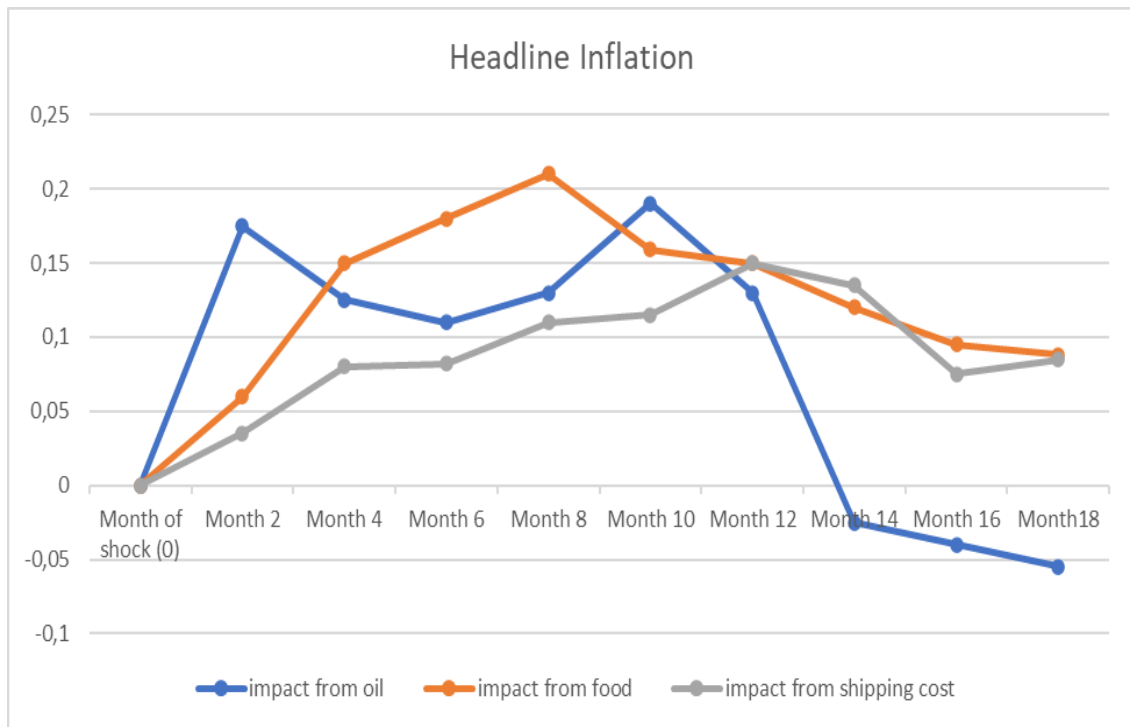
Specifically, the IMF (2022) estimates that a 21.8% increase in shipping cost would increase domestic inflation by 0.15% over 12 months.

We recall that the increases in container freight rates recorded in 2021 in the East-West routes were also far greater, with freight rates that have also reached levels 10 times greater than in the pre pandemic: therefore the push on inflation from container transport could be much greater than the numbers reported here.

It is very interesting the differences point out from the study between oil, food and shipping cost shocks, similar in magnitude but different in times (IMF, 2022). What changes would seem to be the timing of the event: shipping cost is the most lasting over

time with the peak one year after the shock; that from oil instead manifests itself almost completely within 4 months; that from a rise in food prices within 7 months (IMF, 2022).

Graph 1. The impact of shipping, oil and food cost shock on the inflation headline



Source: International Monetary Fund report (2022), our reworking.

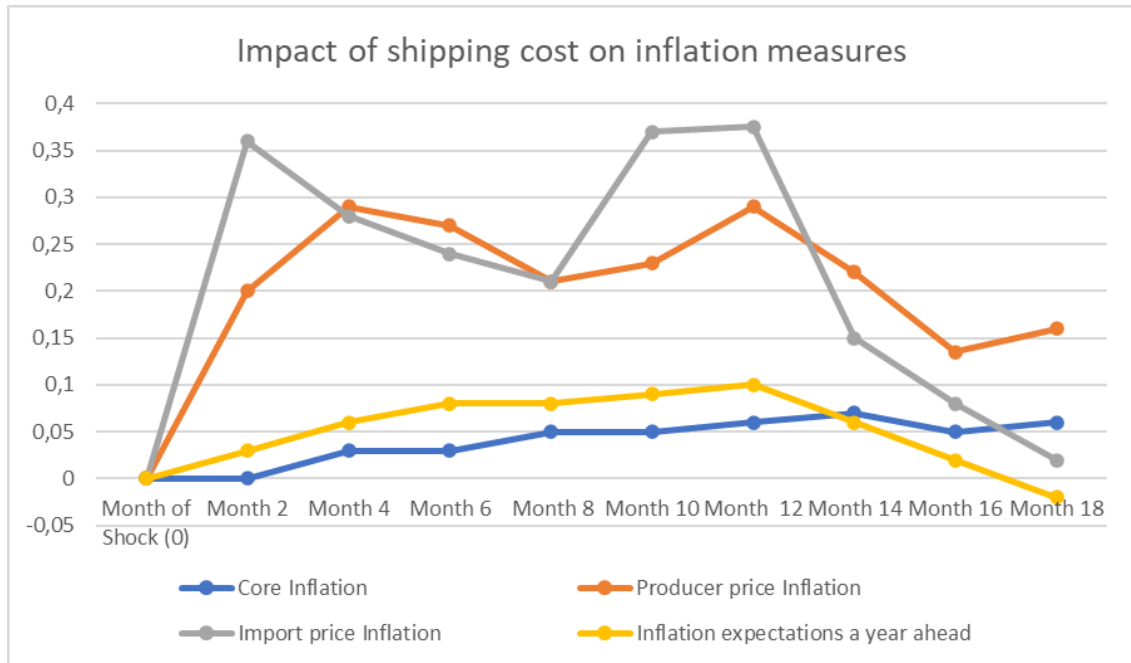
The core inflation from the shipping cost surge was also calculated, that is inflation without the inflationary part from energy and food (IMF, 2022). This shows a trend similar to headline inflation: gradually increasing with a peak in the fourteenth month, but the size is only a third in comparison (IMF, 2022).

The effects on import and production prices, on the other hand, again for a 21.8% increase in shipping cost, are seen to manifest themselves largely earlier and more intensely (IMF, 2022). Clearly, general consumer prices have only a share of imported products while imported goods have more or less all seen an increase in freight rates on the main routes and therefore a direct increase in price, as well as production which imported intermediate goods. In particular, the IMF (2022) calculates that 90% of the increase in import and producer prices occurs in the first four months of the shock: therefore it occurs faster than general inflation. While the peak, which always occurs

between the twelfth and thirteenth month, oscillates between a 0.3% increase that we see in production prices, and a 0.4% that we notice in import prices (IMF, 2022).

Finally, it is also observed how inflation expectations change with an increase in shipping cost. This too has a gradual increase until the twelfth month where it touches + 0.1% and then returns to 0 from the sixteenth month after the shock (IMF, 2022).

Graph 2. Impact of shipping cost on inflation measures



Source: International Monetary Fund report (2022), our reworking.

The IMF (2022) also compared states by income level and geographic area. It emerged that the countries with the most advanced economies suffered less from the impact of these freight increases on prices as they were used to a tighter monetary policy, while the emerging and less developed economies suffered more. In particular the IMF (2022) has seen a trend of increasing impact as per capita income falls, in line with the studies conducted on the inflationary effects deriving from increases in the price of oil, food and exchange rate variations.

The areas most affected by far would be the smaller islands, further away from the largest global markets, strongly dependent on maritime trade (IMF, 2022).

The type of inflation resulting from the increase in shipping costs also appears to have a longer duration, to be more persistent than those deriving from increases in the price of

oil or shocks in the exchange rate (IMF, 2022). In this case it is assumed that, if it is true that monetary policies have improved over the years and inflationary expectations have stabilised, supply chains have increasingly integrated with foreign countries and markets have become increasingly interdependent, as shown by the ever-increasing share of imported goods on domestic consumption (IMF, 2022). This would therefore explain the durability of the impacts despite effective tools to contain inflation: production systems and markets depend on maritime transport and as long as the latter does not stabilise, importers, producers or consumers will pay for the extra costs.

Finally, the study observes which factors can favour or contain the spread of the increase in prices from the maritime sector in the various countries.

First of all it emerges, as expected, that the quantity of imported goods on total final consumer goods has a significant impact on inflation, therefore this factor will determine differences based on the economic structure of the various countries (IMF, 2022). Secondly, a positive impact was also expected from the level of integration in the global supply chain which will favour increases in import prices of intermediate goods and therefore repercussions on production and consumption prices (IMF, 2022). In particular, the indicator used here was the "the share of foreign value added that is used as inputs for producing exports"²¹ (IMF, 2022, p.13) and it has been seen that countries with greater integration will have higher impacts both on headline and on core inflation (IMF, 2022).

Another determining factor is the quality of monetary policies and the usual inflation pattern these countries are accustomed to (IMF, 2022). When an extra shipping cost appears, countries accustomed to a policy of containing inflation and historically lower inflation, result in lower core inflation than countries accustomed to higher inflation where companies think that shocks are more lasting (IMF, 2022). On the other hand as regards overall inflation, import and production prices, the impacts are similar for both

²¹ Carriere-Swallow, M. Y., Deb, M. P., Furceri, D., Jimenez, D., & Ostry, M. J. D. (2022), "Shipping costs and inflation" (No. 17259), International Monetary Fund, p.13.

types of countries, with general inflation a little more rewarding only in the long term for the more rigorous countries (IMF, 2022).

2.7 Spot and Contract rates on Inflation

When talking about spot rates and contract rates two aspects need to be considered. Spot rates and contract rates are in some way interrelated: that is, when contracts are to be renewed, they tend to set prices by looking at the trend in spot rates (ITF, 2022). The trend in contract rates will therefore see an increase following the surge in spot rates, the faster the shorter duration the contracts have: on average the time lag to see the contract rates increase is one quarter of year (ITF, 2022). Secondly, the shipping companies will tend to block new contracts with a high spot rate for the longest possible time: this means that even if at a later time the spot rates fall, the transport costs will remain higher per contract, therefore extra costs from unnecessarily prolonged annuities for an estimated time of up to one year (ITF, 2022).

In an article by John D. McCown published in July 2022, a point that has sometimes passed unnoticed is highlighted. The excessive concentration placed on container price trends on the spot market could mislead operators and analysts (McCown, 2022). That is, McCown (2022) explains that only 10% of container traffic is based on spot rates, while the remaining 90% is based on long-term contracts that differ from spot prices, at least in the US. Shippers with large quantities or with long-term relationships with carriers agree more with fixed prices for long periods, in which only the fuel price can vary per contract (McCown, 2022). Shippers new or below a certain threshold of volume are usually more at the mercy of spot prices. In the difference between operating costs and spot rates, large profits can nestle for shipowners and carriers (McCown, 2022). Spot prices can therefore create misunderstandings and information deficits between the parties or make them believe that this is the only reference price. So regulators shouldn't rely on spot rates alone to make decisions. In particular, McCown (2022) argues that the excessive spot reference could further increase inflation. If the new freight rates are based on higher indices (spot) that reflect only a part of the container trade, it is recalled that we continue to keep prices high and perpetuate inflation, when in reality if we look

at the contract rates (which represent the greater number of flows) prices are actually lower (McCown, 2022).

But many new contracts and their renewals are often based on spot rates and this can be a problem: hikes in freight rates, hikes in costs, hikes in prices.

In fact, if we look at the CTS index (Container Trade Statistics index) we notice a lower growth compared to the Drewry World Container Index: the first is based on all loads, both spot and contract rates, while the second only on spot rates (McCown, 2022). This explains how spot indices result in higher prices on new contracts when used as a benchmark.

Different speech is made on bulk cargoes and liquid cargoes of raw materials: here it is said that spot rates and contract rates are quite in line because the prices of transport of this type are subject in practice to the prices of the materials they transport (McCown, 2022), probably because these types of specialised ships can often carry only that precise raw material or good and not others, therefore their activity is strictly connected with the market trend of what they transport.

About spot rates that are impacting on cost and making less efficient contracts; an interesting example is given in this regard.

McCown (2022) analysed some data from Ikea which stated that it had to increase prices by an average of 9% due to increases in container transport costs along the supply chain. Considering that Ikea has revenues of \$ 44 billion, this means a cost increase of \$ 3.96 billion (McCown, 2022). McCown (2022) calculated the TEUs that on average Ikea would move for its stores around the world and it would turn out that for each container, if the data on the increases suffered were real, the cost increase would correspond to more than 5 thousand dollars per container. An increase of 425.3% which is incredibly similar to the increase that the WCI Drewry index marked from the second quarter of 2020 to the first of 2022 (+ 439.8%) (McCown, 2022). However, if we consider the fact that Ikea is a very large company leader in handling and moving goods efficiently in every place of the globe, it is clear that its cost per container should be well below the average (McCown, 2022). Furthermore, while the WCI Drewry marks the spot rates, Ikea follows instead contract rates for its businesses, therefore much lower freight rates; contract rates that McCows (2022) computed are increased by 102,3% on average in the world in the same period. The increases reported by Ikea therefore are well above the

organisational capacity of the company. Unfortunately, the dynamics that led to these precise choices of the company are unknown: Ikea may have followed spot prices, or it was expecting even greater increases in the shipping sector than existing contract rates when it signed the new contracts (McCown, 2022). Sometimes these cost increases are also used as hedging to raise prices more than the actual additional cost (McCown, 2022). The fact is that, whatever reason has been adopted in pricing, this example can represent how spot indices sometimes induce the market to increase freight rates more, even if it is not necessary, and therefore further contribute to shipping cost inflation (McCown, 2022). Also for example, by creating expectations of further future cost increases for companies that at this point hastily opt for a spot rate rather than a more objective freight rate established by real market conditions, when they have to renew their contracts.

For this reason McCown (2022) stresses that it would be important to publicly disseminate as much data as possible, also in aggregate form, of the various average prices and volumes of the various commercial routes. This could be done through the Container Trade Statistics and the Federal Maritime Commission in US, as among other things the Ocean Shipping Reform Act 2022 did, wanted by the American administration to counter the large price increases on shipping lanes (McCown, 2022). This would help shippers to negotiate more sustainable prices by having more information available (McCown, 2022). The aim is therefore to shorten the information asymmetries, limiting at least in part this type of market failure, promoting data transparency and at the same time protecting the competitive information of carriers, for example by providing aggregate data, hoping that more aware and informed bargaining will help to stabilise freight rates and to shift the benefits a little towards shippers and customers (McCown, 2022).

2.8 Updates from Unctad

Unctad made updates on its predictions in 2022. Given the new Chinese lockdowns, the war in Ukraine and a highly uncertain supply chain that kept freight rates still very high

for another two quarters in 2022, the impacts on inflation have risen (UNCTAD, 2022). Freight rates have been falling steadily since May 2022 but if we look at the Freight Baltic Index we see that at the end of July they are still 6 times higher than in the pre-pandemic (Freightos data, 2022). Furthermore, given the long-term impact (peak 12 months after the shock) that we have seen from the increases in shipping costs, in 2023 consumer prices are expected to rise by 1.6% globally compared to if there had been no surge in the freight rates (UNCTAD, 2022).

In 2023, consumer prices will grow respectively by 2.4% in less developed countries, by 0.6% in landlocked countries, but by as much as 8.1% in small islands developing states; while the import prices will increase of 9.8% in the least developed countries, 3.6% in the landlocked ones, 26.7% in the small islands developing states (UNCTAD, 2022). So after almost a year from the last Unctad 2021 report, the projections on import and consumer prices are reconfirmed with even slight increases. Confirming the disadvantage of the repercussions for the poorest and most isolated countries. Now the trend of these incredible increases in maritime transport costs seems to have been declining for several months, but the impact on prices will still persist and the level of pre-pandemic freight rates is still far away. Even if this phenomenon were to pass in the near future, it will be to be kept well in mind to avoid future shocks of this type in the supply chains, having as consequence the great economic damage that has proved to be there for families and businesses as well as for the whole economy and international trade (UNCTAD, 2022).

CHAPTER III

What solutions could be taken and have been taken to contain transport costs and facilitate the supply chain?

(Policies)

Faced with these unsustainable and sometimes unjustified increases in maritime tariffs, public authorities are called upon to intervene to contain prices, regulate flows and resolve any market failures, in order to protect businesses and consumers, to protect the whole economy from any increases in cost inflation and to sustain the global economic recovery.

This can be done in many ways. Among these it is possible to intervene by expanding and modernising the transport infrastructures to accommodate greater flows in less time; regulate shipping companies to encourage more transparent and virtuous behaviour; find alternative routes less prone to traffic jams; shorten supply chains where the geography of raw materials allows it, for example with land routes that connect Asia and Europe instead of moving by sea; improve technologies; improve port governance or open the market to new types of competition. However, more structural interventions such as those on large infrastructures would require a lot of time and financial availability, desirable interventions but which cannot give relief in the short term. The United States has also moved with interventions of this type.

We will focus on the regulatory policies and on which of these, countries have put in place in the maritime sector to protect competitiveness, to stabilise prices, to resolve congestion in ports and to alleviate damage to supply chain disruptions. Among these, in particular, we will observe what the United States did with the Ocean Shipping Reform

Act of 2022. Then we will see how the European Union has acted. Finally, we will see what projects are standing in Italy to strengthen its maritime economy.

3.1 Regulatory and competition policies

The legislator decided to forbid the possibility of price agreements to reinforce the principle of competition; while the possibility of agreeing to better sharing the loads was deregulated because it was considered useful to the national interest in having a more efficient navigation system (ITF, 2022). However, the agreement on how to divide up capacities was also shown to be detrimental to competition almost more than before (ITF, 2022).

Of major importance, to govern the sector well, would be to have an independent agency specialised and dedicated to this (ITF, 2022). Few countries can boast such a body (ITF, 2022). An example is the Federal Maritime Commission present in the United States which deals with regulating the maritime sector with the main objective of safeguarding competition and good practices in the sector by protecting the public (ITF, 2022).

Currently his work has intensified thanks also to new powers given by Congress, for example now the inspection activities can start even without necessarily having complaints (ITF, 2022). Above all, cooperation with the Antitrust section of the Department of Justice has been strengthened: meetings are recurring, the exchange of information is continuous and there is mutual support regarding skills and personnel (ITF, 2022). Finally, a standing advisory commission was also set up made up of representatives of importers and exporters to continuously update the FMC (ITF, 2022). The fact is that previously it was believed that an agreement on prices could at least help to maintain the stability and predictability of freight rates, therefore fruitful for the entire production system involved in recurrent maritime shipments (ITF, 2022). With the exclusion of the price agreement and the strengthening of the capacity agreement, however, things do not seem to have improved for the competitiveness of the maritime sector (ITF, 2022). Having to compete on prices has led companies to rely on cost savings and invest in ever larger ships to exploit economies of scale, but this has led to a concentration of the market (ITF, 2022). There has been intense competition, but it has

put smaller companies out of business or it has merged many to gain market share. This has led to a small number of larger companies, which now by agreeing on capacities jeopardise the protection of competition and affordable prices (ITF, 2022). In fact, they can manage the capacities at will by reducing or increasing the number of ships, so as to regulate the supply in the sector and consequently the prices; or moving ships on the most convenient routes, creating inconvenience and price increases in other routes as well (ITF, 2022). All this has therefore caused the loss of the stability of freight rates that previously existed and competition even seems to have decreased (ITF, 2022). An intervention by the regulator will be needed in order to rebalance the forces between supply and demand. For example by removing the possibility of organising into consortia to manage capacity or in any case not being able to do so above certain thresholds of market share detained, perhaps obliging companies to always ask a guarantor authority for consent first (ITF, 2022).

Transparency in the charging of fees is important because otherwise companies could insert surcharges in excess to increase profits and not to cover actual costs (ITF, 2022). So it would be important to be able to punctually link each extra commission to the precise fact. For example, when IMO imposed new environmental constraints on fuels, it was seen that the extra commissions for fuels were often higher than the actual extra costs (ITF, 2022). Thus, in the demurrage and detention fees, a more transparent system should be put in place and not to make the shippers pay for delays that do not depend on them (ITF, 2022). The United States has moved in this sense by reversing the burden of proof; but many other countries have also taken action in this regard (ITF, 2022). For example, the Philippines has established that fees must be pre-established with the Marine Authority and made public as well as unchangeable for at least one month (ITF, 2022). In India it has been prescribed that the freight rates, including everything, must be put in writing on a document and that these cannot be changed later (ITF, 2022).

Another theme is the organisation for operators. It can be useful to consider performance indicators: in this way operators know in advance how to adapt or change routes in the face of current situations, while governments and authorities can have clearer images on the problems and be able to intervene with targeted policies (ITF, 2022).

Another issue is the tax advantages, the immunity from antitrust laws and other advantageous provisions for shipping companies justified by their fundamental role in favouring foreign trade and consequently facilitating the economy of the states (ITF, 2022). However, even if all these favourable treatments were to be justified, and sometimes could be revised, states should at least require a minimum service to the country's interest in exchange for these facilities (ITF, 2022).

Some argue that maritime regulators around the world have squeezed competition in the maritime sector instead of protecting and supporting it (ITF, 2022, quoted in Savvides, 2022). This is mainly because an increasingly concentrated market has been allowed to forge alliances to manage the capacity of the fleets at will (ITF, 2022, quoted in Savvides, 2022). This has proven, with this supply chain crisis, to cause great damage to the detriment of shippers and economies. In fact, it is emblematic the question posed by the European Commission on how such high increases were possible with the European demand staying stable for containers; one answer lies in the displacement of ships on the China-US West Coast route instead on the China-EU route by shipping companies, due to higher demand in those markets (ITF, 2022, quoted in Savvides, 2022). Thus, the decline in capacity on the China-Europe route has caused freight rates to rise to the detriment of European businesses and consumers. Hence, an arbitrary choice of maritime operators can favour or severely damage trade, production and the purchasing power of citizens without the competent authorities having been able to intervene at that moment (ITF, 2022, quoted in Savvides, 2022). In reality, the Chinese authorities favoured this shift in the transpacific route precisely out of Chinese national interest, but to the detriment of other markets (ITF, 2022, quoted in Savvides, 2022). Therefore not only will a regulation of these mega maritime alliances be needed but also a coordination of the regulatory authorities in the world because every public or private decision, we have seen, can have a domino effect on other countries and markets (ITF, 2022, quoted in Savvides, 2022) .

3.2 Mega Ships and their impact

The megaships are the result of the innovation carried out by shipping companies to achieve higher economies of scale. However, ever larger ships have different implications on infrastructures and the supply chain (Costa et al., 2018). These ships that have now exceeded 21,000 TEU require larger ports with longer docks, larger cranes, deeper bottoms, wider access channels, etc ... (Costa et al., 2018) After which all the terrestrial law is also conditioned. It will take more trucks in a short time or much longer trains to clear these large sudden loads quickly; consequently train stations have been modernised to accommodate larger trains and larger warehouses have to be built (Costa et al., 2018).

However, the routes also become different: the megaships will go where these infrastructures are available by cutting out the ports that are not infrastructurally suitable. In this perspective, there is a risk of underused or abandoned infrastructures where these loads will no longer be able to move (Costa et al., 2018). In fact, the most important channels in the world already act as choke point and technological cap for shipping companies: this means that the largest megaships can only pass through the Europe-Asia route, especially Suez Canal which constrains the routes (Costa et al., 2018). There will then be consequences on the business model and on the market: the companies have alliances to divide the loads and to be more efficient while the market is gradually oligopolizing itself (Costa et al., 2018). Finally, many smaller ships risk becoming obsolete quickly (Costa et al., 2018). The problem highlighted here is that all these impactful choices are not being taken with the intention of maximising collective benefits, no one supervises "the efficiency, sustainability and fairness"²² (Costa et al., 2018) of these public and private investments (Costa et al., 2018). These decisions are mostly made by private entities pursuing their own interests; by geopolitical or geoeconomic alliances or by small local authorities that want to maximise their attractiveness without any collective vision (Costa et al., 2018).

²² Costa, P., Montero, J. J., Roson, R., & Casullo, L. (2018, November). "The impact of disruptive technologies on infrastructure networks". In Paper delivered to the 11th meeting of the Network of Economic Regulators, OECD, Paris.

Olaf Merk (2015) warns against this excessive growth in the size of ships: in addition to all the points mentioned above, he highlights that with this gigantism the calls of the services will become smaller and the supply chain less resilient due to less diversification, "all your eggs in one basket"²³ (Merk, 2015). In fact, the risks increase: delays and accidents will affect a greater number of containers at a time, and it will be more difficult to manage these events (Merk, 2015), as also happened with Ever Given in the Suez Canal. Another critical point highlighted by Merk (2015) is the optimal point between the size of the ship and the overall costs saved for the community. While for private companies a larger ship is always an advantage in economics of scale and therefore of costs, it is not so for the land leg which sees costs increase after a certain size of the ship (Merk, 2015). This considering all the critical issues and additional investments that must be faced in port and land to manage these new giants of the sea. Merk (2015) thus argues that after a certain point an increase in the size of a ship is no longer convenient in economic terms if we consider all costs including those on land, at least not with the current infrastructures. Taking into consideration that these megaships, if well regulated, can bring savings to importers and exporters due to the lower costs on the sea leg, the debate is wide on this topic.

For this reason Costa et al. (2018) talk about a vertical integration that includes maritime leg, port leg and land leg to have a better coordination along the entire supply chain and thus reduce costs also inland, perhaps using digital platforms that connect all of this.

It will therefore be assessed from time to time, port by port, region by region, which ports and infrastructures will be made accessible for these megaships and on which it is not economically convenient such huge investments based on the reference market. But this decision must be made at a supranational coordinated level with clear environmental and economic objectives that aim at the well-being of all, at the companies of the nations and not at shipping companies. The solution could be mixed: with large ships in the largest and geographically accessible markets, smaller ships for areas with less traffic or in which it is not worth investing because there are other more convenient and efficient points also from an environmental point of view (see European

²³ Merk, O. (2015), The Impact of Mega-Ships, International Transport Forum, 22/06/15.

situation). Clearly, to protect ports and secondary areas, it will be necessary to reopen to competition as much as possible in the maritime sector, allowing even smaller operators to operate so that less convenient areas for big shipping companies are not neglected and they are guaranteed a service that is so essential for their own survival. The importance lies in a truly holistic vision that involves all states with a view to common intentions: environmental and economic (collective) in this case go hand in hand.

3.3 Vertical Integration

One of the problems with this boom in profits for shipping companies is that now more than ever they will tend to expand their business along the transport chain through vertical integration. That is, they will tend to buy suppliers or customers of their services to increase their control over the entire route of the goods. The acquisitions have already been numerous. While it could be an advantage for the transport system to have everything integrated²⁴: transaction costs decrease, time too, there is better data integration so everything becomes more efficient (ITF, 2022). On the other hand, however, the shipping companies would assume a monopoly position on the entire route that could lead to disadvantages for the users of these services: too strong the contractual position for the carriers that could impose increasingly stringent and incorrect conditions; and prices of services that instead of lower, due to the efficiency acquired, rise due to the monopoly created (ITF, 2022).

The process of vertical carrier integration began even before the pandemic, but with the recent record of profits for shipping operators this has increased exponentially. Airlines, rail transports, warehouses management, e-commerce logistics platforms, container terminals were bought in every part of the world (ITF, 2022). Now, in addition to restricting the margins of competition on the market, this integration could also lead to unfair competition in the sectors in which these companies enter to operate (ITF, 2022). This is due to the fact that shipping companies operate under special regimes with immunity as regards antitrust rules and with tax concessions (ITF, 2022). Therefore, they

²⁴ Digitalization makes vertical integration more easy.

correspond to market giants who, moreover, could enter in advantageous conditions if the ancillary activities were linked to the core activity (ITF, 2022). An important step has been taken thanks to the OECD / G20 “Inclusive Framework on Base Erosion and Profit Shifting”²⁵ (ITF, 2022, p.48): in fact, here it was inserted a minimum global tax from which the shipping companies sector is excluded, however those of logistics, forwarding and inland transport are not recognized as ancillary activities, thus safeguarding these sectors from unfair competition of the shipping lines if they could take advantage from the tax exemption (ITF, 2022).

Alessandro Pitto, President of Spediporto, has already highlighted that in Italy "some shipowners give their availability in the hold only if additional logistics services are acquired"²⁶ (Capuzzo, 2022). This creates market asymmetries that make freight transport less efficient. In addition, Pitto adds "that with current technologies²⁷, intermediation spaces are reduced and large companies are able to reach even the smallest customers, increasingly removing freight forwarders from the market"²⁸ (Capuzzo, 2022). The concerns are also advanced by Schedone, representative of the port terminal operators of Genoa, highlighting the tax benefits that these companies also have in ancillary activities, in this case, however, only if they operate exclusively in Italy or Europe (Capuzzo, 2022).

In this case, the Italian and European legislation must quickly implement the “OECD Inclusive Framework on Base Erosion and Profit Shifting”²⁹ (Capuzzo, 2022). Above all, it will be necessary to think of concentration limits for these companies in the vertical

²⁵ OECD/G20 Base Erosion and Profit Shifting Project Statement on a Two-Pillar Solution to Address the Tax Challenges Arising from the Digitalisation of the Economy, 8 October 2021.

²⁶ Capuzzo, N. (2022), L’allarme di Pitto: “Accesso condizionato alla capacità di trasporto per gli spedizionieri”, Shipping Italy, 16/05/2022.

²⁷ Digital and Information Technologies.

²⁸ Capuzzo, N. (2022), L’allarme di Pitto: “Accesso condizionato alla capacità di trasporto per gli spedizionieri”, Shipping Italy, 16/05/2022.

²⁹ OECD/G20 Base Erosion and Profit Shifting Project Statement on a Two-Pillar Solution to Address the Tax Challenges Arising from the Digitalisation of the Economy, 8 October 2021.

purchase of assets and/or limit their practices that lead to market centralization by forcing customers to turn to them for all services.

Finally, in the case of vertical integration, the regulator should think about methods of redistribution of the benefits from acquired efficiency.

3.4 Regulatory policies of United States

In the United States, the issue of interrupted supply chains and of increases in freight rates, but also of the explosion of demurrage³⁰ and detention fees³¹, has become central among public opinion in recent years (Manaadiar, 2022). In particular, we can say that the United States is itself perhaps the most striking and greatest example of this phenomenon. In fact, the East-West and West-East routes were the hardest hit by price increases and delays. Both for the lockdowns that occurred in various countries including China, and for the explosion of demand in the main world markets, especially in the US, following highly favourable monetary and fiscal policies to support the economic recovery.

Suffice it to say that the freight rates for transporting goods from Asia to American coasts have increased by 100% since January 2020; but in the reverse direction, from the United States to the Asian coasts, have seen increases by up to 1000% (Shipping and Freight Resources, 2022c).

In addition, the ports of Los Angeles and Long beach, which represent 40% of all goods entering the United States, were among the most congested in the world, reaching the hundred ships waiting outside and thus being classified among the least efficient in the world, despite the record volumes handled in the last two years (Manaadiar, 2022).

This explains the determined action of the Biden administration: the President publicly lashed out at the shipping companies, all of foreign entities, which with their unjustified profits, improper practices and undue penalties have fleshed out their profits at the

³⁰ Demurrage fees are paid as a penalty when the container lies longer than expected in the port, beyond the scheduled free days (Del Vescovo 2016).

³¹ Detention fees derive from the use of the container beyond the maximum time established, outside the terminal (Del Vescovo 2016).

expense of farmers, producers and American breeders as well as all American consumers (Manaadiar, 2022). The World Shipping Council (WSC), the association that represents the voice of the liner shipping companies, for its part replies that although a control by the investigative authorities is acceptable, they cannot tolerate these attacks on those who supported America during the pandemic and reject these rhetorical simplifications (Manaadiar, 2022). On the other hand, it highlights the record of loads transported in these two years and the considerable investments made by the shipping companies to expand their fleets (Manaadiar, 2022). It also notes that there has been a significant increase in demand and that congestion will not be resolved by attacking shipping companies but by investing in the country's infrastructure (Manaadiar, 2022). So let's see what the Ocean Shipping Reform Act of 2022 has envisaged and what its limits are.

The text aims to ensure competitiveness and to favour exporters a little more in their lower contractual position (Manaadiar, 2022). The hope is to level prices and raise margins for American exporters and importers and to not increase consumer prices.

This law gives to the Federal Maritime Commission (FMC) more powers to investigate and sanction any unfair commercial practices and shipping lines will have to report more data including exported and imported tonnage (Manaadiar, 2022).

In particular, the points that the new law intends to address are:

"(A) Expands safeguards to combat retaliation and deter unfair business practices;

(B) Clarifies prohibited carrier practices pertaining to detention and demurrage charges and vessel space accommodation;

(C) Establishes a shipping exchange registry through the FMC;

(D) Expands penalty authority to include refund of charges;

(E) Increases efficiency of the detention and demurrage complaint process"³²

(Manaadiar, 2022).

Therefore the administration aims to increase transparency in the sector by sending timely data to the FMC which will thus monitor the actions of the companies and

³² Manaadiar, H.(2022), How the Ocean Shipping Reform Act 2022 will address US supply chain disruptions – or not.., Shipping and Freight Resource, 16/06/2022.

sanction them (Manaadiar, 2022). Another important change concerns the reversal of the burden of proof regarding delays in clearing the container field in ports and delays in returning containers to companies: in other words, all those demurrage and detention fees that contributed for 2.2 billions to the profits of liner shipping in 2021, now to be collected, the guilt of the shipper must be proved by the big carriers: a nice relief for many small importers and exporters (Shipping and freight resources, 2022c). Furthermore, once any unjust sanctions have been identified, the Commission will be able to take action to be reimbursed (Manaadiar, 2022).

Moreover the issue of refusing to load goods in a discriminatory or unreasonable way is dealt with great importance in the new text.

In fact, some shipping companies preferred not to occupy the entire hold with full containers, many containers were left empty due to lack of these in exporting countries such as China (Manaadiar, 2022). So in order to bring containers where they were needed most by the companies and for the greater speed of being able to reuse them where it was most convenient, many cargoes from the United States were refused. This entailed the insertion of a specific section in the Ocean Shipping Reform Act which concerns the prohibition of discrimination in the loading of goods (Manaadiar, 2022).

These include the prohibition of retaliation against shippers or agents of shippers, even by refusing them spaces for past or current actions that have led to preferring another carrier or complaining against the same or for any other reason (Manaadiar, 2022).

Then it is clearly stated that carriers cannot refuse cargoes without reasonable reason if there is space available in the hold (Manaadiar, 2022).

Finally, in addition to the reversal of the burden of proof, the customer is strengthened with regard to demurrage and detention fees by requesting a whole series of information from the carriers in the event of a claim for these payments. Among the information requested we remember the port of unloading, the number of containers, the start and end date of free time from commissions, the rules of detention and demurrage, the rate applicable to these rules (Manaadiar, 2022). But above all it is added the fact of specifying that these rules comply with the rules of the Federal Maritime Commission and that the carrier has not in any way caused or contributed to causing the delays that will then entail the detentions and demurrage fees (Manaadiar, 2022).

However, some weaknesses of this reform remain. First of all, the congestion of the ports is not affected if not marginally. We can think of a benefit only to the extent that shipping companies will have less interest in keeping their containers in the port to increase detention and demurrage fees, as now they have to prove the guilt of the shipper and do not have to contribute to the delay. This could lead to an acceleration in container movement but it is not decisive. The flows have been too high for the sudden high demand and the lockdowns have created waves of loads to manage. The infrastructural point is not resolved in the Ocean Shipping Reform Act, the passage nodes remain critical in the face of new events of this type (Manaadiar, 2022). Above all, the efficiency of the ports is not questioned. The Container Port Performance Index (CPPI) 2021 puts the ports of Los Angeles and Long Beach at the bottom of the list for efficiency, despite the very high volume of cargo handled (Manaadiar, 2022). Focusing on automation could be a solution but the issue of how to find a compromise between the representatives of the sector and trade unions is not addressed: any strikes would be deleterious for the entire supply chain (Manaadiar, 2022).

Another little-addressed point was that of the chassis. Shipping companies once owned both containers and attached chassis, now the chassis are managed by other companies, the intermodal equipment providers, who are in charge of supplying, maintaining and repairing the chassis (Manaadiar, 2022). The fact is that it seems that some shipping companies are putting restrictions on the use of chassis, i.e. they are forced to use some chassis only for certain types of containers, perhaps to prioritise their orders (Manaadiar, 2022). This causes severe limitations to truckers who can only take up certain goods, making them earn less because they often do not own chassis and slowing the flow of goods (Manaadiar, 2022). Another technical issue on the chassis would be that of their length: some terminal operators do not allow truck drivers to get out of their vehicles to adjust their length: this way trucks with 40-foot container chassis cannot load 20-foot containers if necessary, further limiting the outflow of goods (Manaadiar, 2022). These points are not addressed by the reform wanted by the Biden administration.

The positive note remains: after years of industry deregulation that allowed shipping companies to concentrate and avoid certain antitrust rules, now we are starting to take the first steps to counterbalance the enormous bargaining power of these companies.

Suffice it to say that until 2011 the three alliances that included the main shipping companies controlled 30% of container traffic by sea, now they carry 80% in terms of capacity and 95% in the main East-West route (Shipping and Freight Resource, 2022c). Now the Federal Maritime Commission will work with the Justice Department to safeguard competition as much as possible, as the market remains highly concentrated and oligopoly (Shipping and freight resources, 2022c). However, some actions undertaken by the FMC are starting to bear fruit. The Commission has set up branches specialised in shippers' complaints and then went to investigate any incorrect behaviour of the carriers and there are many investigations open (Shipping and freight resources, 2022c). It has also worked with the ports of Los Angeles and Long Beach to develop fees for long-stock containers that exceed nine days of storage: the result was surprising: since the announcement of these new tariffs, the containers that lay for more than nine days have collapsed by 70% (Shipping and freight resources, 2022c). In this wake it was thought to implement additional tariffs also for empty containers that unnecessarily clogged the ports: in the following period there was a 25% decrease in empty containers in the port of Los Angeles (Shipping and freight resources, 2022c).

The alliances were formed to coordinate travel and shipments in order to better fill the holds and make the entire maritime transport process more efficient (Etter and Murray, 2022a). In this way, however, the shipping companies decide in an increasingly arbitrary way the routes, the destinations on which to call, the quantities of ships available, the loads to accept or refuse; thanks also to a deregulation process that has allowed the companies ample freedom. In all this there is the risk of an oligopolistic agreement also on prices given the few huge shipping companies. The profits that are between 150 billion and 190 billion dollars in 2021, in some cases exceeding the total profits of the last nine years, suggest an oligopolistic behaviour, if not anti competitive at least of abuse from a dominant position by forcing small shippers to conditions beyond every way expensive because they lack any other alternative (Etter and Murray, 2022a).

One of the problems that unfortunately is not addressed is that this sector is covered by antitrust immunity (Etter and Murray, 2022a). At the beginning of the twentieth century this was intended to strengthen coordination in the national and general interest, to

grow the American fleet and not to make price agreements (Etter and Murray, 2022a). Anyway, any price agreements had to be communicated but over the years these bonds have loosened, including with regard to agreements on prices and transparency of practices (Etter and Murray, 2022a).

The approved measures of OSRA 2022, that give back powers to small exporters / importers, do not eliminate antitrust immunity although the justice department has repeatedly affirmed the institution's obsolescence in this sector (Etter and Murray, 2022a).

In conclusion, we can say that this reform text will undoubtedly bring about advantages and better treatments for shippers but the effects on prices could be only marginal if antitrust immunities remain or a ceiling on freight rates is not put. The skyrocketing prices of freight rates have been a contributing cause of many factors, as Mario Cordero, director of Long Beach, sustains, but the shipping companies have been able to march on this confusion, obtaining the most they could in a market in which the forces of demand and supply found themselves tremendously unbalanced, and being in fact a market with an oligopolistic structure, the effect was an increase in prices that did not stop growing until demand was in that way exceeded. (Etter and Murray, 2022a)

As Brian Whitlock (2022), Senior Director Analyst with the Gartner Supply Chain, argues, the effects could have medium and long-term benefits for customers in the maritime sector following this reform but in the immediate future they may not have great results if the structural causes of the port blocks do not fail: few efficiency, not adequate infrastructures both on ports and in the hinterland, interruptions in supply chains due to lockdowns, accidents or other.

In reality in the US actions to intervene on the infrastructures have been undertaken but with other acts. Structural measures that are useful but also these measures will only be beneficial in the long term. These include the "Infrastructure Investment and Jobs Act" of November 2021 which allocates 1300 billion to modernise and enhance the country's infrastructures (ITF, 2022). This large budget includes 17 billion for ports and maritime transport with 241 million grants for ports specifically to face the challenges of the supply chain crisis (ITF, 2022). Some ports have significantly increased storage spaces

even outside the port areas to ensure easier circulation for trucks and a clearer port or there was the temporary doubling in height of container storage in the port of Long Beach, previously not allowed for landscape reasons (ITF, 2022). In California alone, port projects amount to 2.3 billion for the two-year period 2022/2023 (ITF, 2022).

In addition, another 4 billion dollars will be financed through the US Army Corps of Engineers to strengthen ports and inland waterways plus another 3.4 billion dollars to strengthen customs and make the passage of goods more fluid (Gili, 2021). In particular, the Biden administration seems to want to focus a lot on the exchange of data between the various stakeholders to make the passage of goods through the gateways more efficient (Gili, 2021). The US Digital Service is working with the Federal Maritime Commission and the Department of Transportation to achieve a permanent and continuous exchange of data to understand how to better manage flows as well as intervene in the event of unfair commercial practices (Gili, 2021). This is because better coordination between ports can help avoid traffic jams.

3.5 Regulatory policies of European Union

In Europe, the situation on freight rates is not much better. Indeed, the government authorities do not seem to have perceived the urgency and magnitude of the problem. But perhaps they cannot understand it because the latest renewal on the exemptions to antitrust for shipping companies took place in March 2020 just before the storm that swept the supply chain and the explosion of container prices. The fact is that the CBER regulation (Consortia Block Exemption Regulation) renewed by the European Commission itself, will be valid until April 2024, so perhaps for the European Commission it is good to gloss over and pretend not to see the elephant that has outside in the garden (inforMARE, 2020).

The fact is that these exemptions for sea carriers have worked in the past to have a more efficient freight transport system for both customers and companies that have thus been able to lower costs. The European Commission itself states *"that, according to its*

*assessment, in recent years the cost of transport containers of 20 feet, and also the consequent freight on these, have dropped by about 30%*³³ (inforMARE, 2020). Therefore, the Commission considered it useful for the industry to leave this possibility of agreements on the capacity of goods based on this background data (inforMARE, 2020). Only that in recent years the concentration of the market had grown and with the pandemic the bargaining power of the large shipping companies came out and the antitrust exemptions allowed them even more room for manoeuvres in their best own interests. In a letter sent to the EU Commission by the associations representing freight forwarders and port operators, it is highlighted that:

*“the major logistical problems caused during the pandemic, such as the lack of empty containers, certainly remain an important factor of higher costs, but the 186 billion profits of 2021 of the shipping lines leave us stunned by the speculation that was made to the detriment of families and businesses by leveraging serious problems in the sector”*³⁴ (inforMARE, 2022b).

Many freight forwarders have been forced to accept freight rates at the spot rate which has increased dramatically in recent years in order not to see their goods being left on the ground; moreover, the blank sailings³⁵ were numerous and arbitrarily decided to the detriment of the contracts stipulated as well as the scheduled departure and arrival times never respected, however the penalties were paid and in a salty way by the shippers (inforMARE, 2021).

In January 2021, faced with repeated appeals from CLECAT (European Association for Forwarding, Transport, Logistics and Customs Services) and ESC (European Shippers' Council), the Competition Directorate explained that it did not intend to open an

³³ Informare (2020), La Commissione UE ha concesso l'estensione per quattro anni dell'esenzione dalle norme sulla concorrenza a favore delle compagnie di navigazione containerizzate, inforMARE, 24/03/2020.

³⁴ Informare (2022b), Caricatori e spedizionieri chiedono nuovamente alla Commissione UE di rimettere mano al regolamento di esenzione per categoria per le compagnie di navigazione containerizzate, inforMARE, 22/07/2022.

³⁵ Blank sailing is the phenomenon that ships perform when they skip a call, a port or a region to keep the schedule (Greenworldwide, 2020). This action is now prohibited in the United States.

investigation into what was happening and that the associations would have to open a legal procedure with certain evidence if they wanted the Commission to proceed (inforMARE, 2021). Now in July 2022 the Commission is sending questionnaires to operators to be sent to the EU institutions for any complaints and reports of how these years have gone under the CBER (inforMARE, 2022a).

The Consortia Block Exemption Regulation, applied for the first time in 2009 and then extended every 5 years, is an exception to one of the pillars of EU law, namely free competition (European Union [EU] Commission, 2020). This important exception, an option foreseen by the treaties under certain circumstances, allowed maritime carriers to coordinate and join forces to manage capacity more efficiently, reducing costs and consequently prices for shippers and therefore for European businesses and consumers (EU Commission, 2020). However, this passage from cost reduction to price reduction is not automatic or obvious, it would always need to be verified by some authority to understand how to best regulate it. An important detail is that these consortia must not exceed 30% of the market share to enforce this exception (EU Commission, 2020). This threshold however is not respected in any of the routes to and from the European Union and for the European Commission itself two out of three alliances do not respect these constraints: this would give to the European Commission the legal opportunity to review this regulation and it should be done as soon as possible (ITF, 2022).

In particular, it is the article 101 of the Treaty on the Functioning of the European Union that prohibits cooperation agreements between companies that would undermine the principle of competition to the detriment of consumers and other companies in the sector (EU Commission, 2020). But in the third section of the article it is specified that for reasons concerning:

*"improving the production or distribution of goods or to promoting technical or economic progress, while allowing consumers a fair share of the resulting benefits without eliminating competition"*³⁶ (art.101 (3) TFEU),

this principle may be waived (EU Commission, 2020). Right now, however, this derogation could be contested, as it is no longer pursuing as its ultimate goal that of

³⁶ Article 101(3), Treaty on the Functioning of the European Union (TFEU).

bringing a significant share of benefits to European consumers or entrepreneurs; indeed this regulation, at least in this historical phase, is only creating damage to European citizens, with shipping lines that minimise costs but maximise profits in a speculative way on the skin of just those who had to take advantage from these laws, that is the community. For this reason, it is strongly demanded by ten associations of shippers and forwarders³⁷ that the European Commission intervene well before the natural expiry of the Consortia Block Exemption Regulation (inforMARE, 2022b), because there should be the legal details to do so, since the shipping companies have failed to comply with the principles enshrined in the Founding Treaties of the European Union.

In France for example, the government has asked CMA CGM, the largest container ship company in the country, to help French citizens in this difficult period of runaway inflation (Ship technology, 2022). The company has decided to reduce the tariffs for French importers on 40-foot containers by 500 euros, which could correspond to a saving of about 10% on average at this time (Ship technology, 2022). However, this means that the French government is also accepting this deregulation of the maritime sector to the detriment of consumers and businesses, asking for a concession to the shipping companies at the most, which seems more like an act of favour given in exchange to continue to act as they wish unperturbed.

Another weak point for Europe remains the fact that the routes of the goods used are not the optimal ones. According to Paolo Costa (2022), every year 750 thousand tons of oil equivalent more are burned and 345 thousand tons of CO₂ are emitted unnecessarily simply because in Europe a logic of minimum path is not used but the interests of single companies in oligopoly and single countries win; in this case we are talking about the oligopoly of the ports of Northern Europe and of the Northern European states that defend their business also within the European institutions. The fact is that instead of using the ports of southern Europe to then transport goods to central-southern and

³⁷ CLECAT, FEPORT, European Shippers' Council, European Barge Union, Global Shippers' Forum, European Tugowners Association, UIRR, FIATA, International Association of Movers e FIDI Global Alliance (inforMARE, 2022b).

central-eastern Europe, the large ports of Northern Europe are used, imposing a much longer route both by navigation and by land afterwards (Costa, 2022). This is because the ports of the North, led by large oligopolistic companies, are larger and better equipped for large ships, offer better services and better technologies, and adequate infrastructures inland (Costa, 2022). However, the European institutions do not worry enough to plan this traffic shift which would entail significant environmental benefits and enormous cost savings for manufacturing companies in much of Europe (Costa, 2022).

On the other hand, Italy has not done enough to strengthen its ports, especially those of the Upper Tyrrhenian Sea and the Upper Adriatic, which could serve the European markets of Southern Germany, Switzerland, Austria and part of central-eastern Europe (Costa, 2022). Even the budget constraints of the past have not favoured these investments in our country, however, even now with the recovery fund, investments in ports are underestimated and the push in Europe is still weak with respect to the great challenge that awaits us.

The United States, on the other hand, in addition to acting at the regulatory level with the "Ocean Shipping Reform Act 2022" and at the level of investments with the "Infrastructure Investment and Jobs Act" which places 17 billion only on ports, have also thought about enhancing competition strengthening and investing in ports other than the main ones, which will thus be able to attract more and more flows, decongesting and competing with other ones (Costa, 2022).

3.6 Italy situation and future prospects

In Italy the port situation was better from the point of view of congestion. Unfortunately, the reason is that we have less traffic than a country in our geographic location should have. Probably this is due to the fact that we have lost competitiveness with respect to other ports: we are no longer central in the Europe-Far East or America-Europe / Far

East routes because other ports have won in attractiveness, both in North Europe both in Mediterranean, in the latter case even with foreign investments instead of the EU ones, as in Greece happens. Many Italian shippers are also de facto forced to use ports of the Northern Sea. We suffer from the competitive advantage of the large ports of Northern Europe, which are more infrastructurally and technologically prepared. The situation of Italian port competitiveness remains critical because, even if there has been an increase in flows in recent years, crumbs are left behind in comparison with other European ports. If we look at the Costa and SRM (2022) data on the TEU increases in the various European ports, we can see the differences between our ports and those in the North. In particular, we can observe that the Rhine-Scheldt Delta port system, which includes Rotterdam and Antwerp, marked an increase of 6.3 million TEUs between 2015 and 2021; but also the Spanish ports in the same period mark an excellent result of +2.5 million TEUs (SRM and Paolo Costa elaborations on official EU data and port authorities, 2022). The same thing cannot be said for the performance of our ports, which grow, yes, but by very little in comparison. The Costa and SRM (2022) data indicate a modest +0.53 million TEU as regards the Ligurian ports and a +0.54 million TEU in the ports of the Upper Adriatic but including the ports of Rijeka and Koper. The remaining Italian ports led by Gioia Tauro are classified as transshipment and mark +1.8 million TEU but this data also includes the other ports of the Mediterranean transshipment (SRM and Paolo Costa elaborations on official EU data and port authorities, 2022). Therefore we can see how the ports of Northern Europe continue to attract many more flows than ours, so the trend instead of reversing in favour of Italy is strengthening and it is widening the gap. However, it should be noted that other Southern European countries such as Spain have grown much more than us and that therefore Italian national politics can do a lot despite the divergent interests of Northern Europe (SRM and Paolo Costa elaborations on official EU data and port authorities, 2022).

However, the prices and flows increase have also occurred in our country and for this reason the National Recovery and Resilience Plan tries to strengthen maritime infrastructures as well as simplifying legislation and bureaucracy.

It should be understood the strategic importance of the Blue Economy to the overall economy and the strategic position of our country, in the centre of the Mediterranean,

that could be exploited to create value in our territory; as well as faster and more sustainable routes for Middle Europe. But we are still behind on this point of view.

The importance of the maritime sector is increasingly under the eye of all after this supply chain crisis, so that Confindustria (2022) has drawn up "Progetto Mare"³⁸, a report which makes policy proposals to launch and modernise the economy of the sea in our country (De Forcade, 2022b). Some interesting numbers from "The Eu Blue Economy report 2021"³⁹ shed light on a sector that is already very important for Italy: 530 thousand employees, 82.2 billion in turnover, investments for 2.4 billion (EU Commission, 2021, quoted in De Forcade, 2022b). This sector can still grow a lot given the great improvements that we can still achieve and the vast European market basin that our coasts could serve; but only if we become more attractive as a destination for shipping companies.

Unfortunately, a large turnover in the transport and logistics sector is not necessarily a positive factor for the national economy. Within this data, many pockets of income or unnecessary positions could be hidden, which increase the total cost of transporting goods for companies. In fact, there is a trade off between turnover for the transport sector (transport supply) and turnover for the manufacturing sector (transport demand): the greater the wealth that will be able to retain the transport and logistics sector, the lower the wealth for the manufacturing that bears the costs of transport (Costa 2019).

For Italy in particular, reducing these inefficiencies on the logistics chain would be very profitable for manufacturing companies, that import and export, and for consumers (Costa, 2019). Reducing these extra margins in transport means making businesses and the country more competitive. But how can this be achieved? It is necessary either to reduce the price margins or the quantity margins in this sector (Costa, 2019). In the first case, it is necessary to increase competition in the relevant markets by making port systems able to integrate services so to compete with other areas. For example through

³⁸ Confindustria (2022), Progetto Mare, Confindustria Servizi, Roma, May 2022.

³⁹ European Commission, Directorate-General for Maritime Affairs and Fisheries, Joint Research Centre, Addamo, A., Calvo Santos, A., Carvalho, N. (2021). The EU blue economy report 2021, Publications Office of the European Union.

"wide ports" in the sense of coordinating neighbouring and complementary ports that could compete by networking as in the case of Upper Adriatic (Costa 2019). These ports should also be considered "long ports" in the sense that they should be well integrated towards the inland, always to compete with Northern Europe ports and also to reach larger operators able to innovate and to be more efficient (Costa 2019). In the case of quantity margins, it is possible to intervene by making the goods do the minimum route, that is minimising the distances and kilometres to be covered (Costa 2019). Also in the latter case we have seen that much can still be done in the European Union and it is precisely by making our ports more accessible that we could reduce the distances with central Europe: polluting less and paying less unjust transport revenues (Costa, 2019). In particular, it is the ports of the North Tyrrhenian and North Adriatic that would allow the minimum route for their geographical position and which should be organised in a coordinated system (Costa 2019). For example in the North Adriatic, where the core European corridors of the Mediterranean and Adriatic-Baltic pass, Ravenna and Venice can serve the market of Northern Italy, that of Switzerland and that of Southern Germany; while Trieste that of Austria, Czech Republic and part of Central-Eastern Europe competing but also cooperating with Rijeka and Koper to attract more ships (Costa, 2019). Similarly for the types of vessels they can be attractive, with Venice which could in future accommodate offshore mega ships while Trieste, Rijeka and Koper onshore (Costa, 2019).

Another striking example is the fact that many Venetian companies have to refer to the port of Genoa to import and export, instead of that of Venice, deviating from the minimum path indicated, bearing higher costs and creating pollution, traffic and risk of accidents (Costa, 2019). Costa (2019) has calculated that 8.2% of the Veneto import / export volumes that go to Suez, therefore that could arrive/leave from Venice, go to Genoa, creating 13 million more costs for imports and 14 million for the export.

This is due to an adapted line that refers to the one used in the last century when trade with the United States was much more central (Costa 2019). Now instead the flows have moved eastwards for several reasons: the increasingly predominant role of Asia and for an increase in intra-Mediterranean traffic, for China's One Belt One Road initiatives to reach the European continent, for an extension of the European Union to the east and for Italian manufacturing that moved to the east of the country (Costa, 2019).

Although the National Strategic Plan of Ports and Logistics 2015 and the legislative decree Delrio 169/2016 have brought some innovations for bureaucratic and governance streamlining, with the introduction of the authorities of port systems, the regulation carried out by Italy is not yet adequate according to Professor Costa (2019): no sensible “wide ports” have been created with a view of European competition on core ports; “long ports” were not thought with a view of competition on European core corridors; integrations on the corridors by subjects able to innovate and compete on a European scale have not been facilitated; there is still no system with the ports of Rijeka and Koper in the Upper Adriatic and for the accessibility of megaships in our ports we are still behind infrastructurally (Costa, 2019). All of this creates our system unattractive and less competitive for mega ships and mega cargoes which thus turn to other destinations in Northern Europe or other more accessible Mediterranean ports as shown by the data reported by SRM and Costa (2022).

In fact, the crux of the matter is precisely that of being able to compete with other port systems to win the relevant European markets by making our ports competitive through local cooperation of the various systems, making both the ports in the various systems and the various port systems complementary and not substitutes: with the aim to serve different European markets on different European core corridors (Costa, 2019).

Also for this reason a unique model of port system authority for all ports, according to Costa (2019), does not seem the most correct way, but it would have been better to differentiate them based on the type of competition: on the European markets for the Upper Adriatic and the Upper Tyrrhenian Sea; on the transshipment of the Mediterranean for the other ports (Costa, 2019).

One of the central issues on which Italian national policies are developing concern the Zes (Special Economic Zones): these are areas adjacent to the ports in which companies can act with a facilitated system of taxation and administrative simplifications. The goal is to bring exporting and importing companies closer to the landing points of goods in such a way as to minimise transport costs and externalities from pollution, creating more competitive companies and an overall healthier environment. These areas in Italy were established in the South both to encourage economic growth in the most disadvantaged part of the country and for the geographical position closest to the international routes that cross the Mediterranean.

Now the Zes have also been launched in Italy with recent government interventions that have unblocked the situation. The Southern Dicastery has concluded the appointments of the Commissioners of the Zes and the Ministry for Infrastructure and Sustainable Mobility has made reforms to simplify the strategic planning of the ports, previously with too much disputed competences with the municipal and regional authorities (C.Fo., *ISole24Ore*, 2022).

Thus these areas become points of attraction for investments for the territory by national and international companies; the Government has allocated a further 630 million through the PNRR to encourage this development and to guarantee the infrastructure of these territories (Angiolillo, 2022). In particular, there is talk of last mile interventions, necessary work aimed at connecting the railway network and motorways to the ports in the last stretch in order to guarantee intermodal transport (Angiolillo, 2022). The latter is in fact another cornerstone of the government's strategy to make freight transport more streamlined and sustainable, especially as regards rail links. Free the roads from the numerous trucks that create pollution and traffic to switch on faster and more ecological trains; besides the fact that the trend of shortage of hauliers becomes more and more accentuated; then the train becomes a simple solution to carry larger volumes in a cleaner way (Morino, 2022b). In fact, Italy lags behind on this aspect, with a national average of only 25% of docks directly connected to the railway network (Morino, 2022a). Things could change, the PNRR invests heavily on the last mile stretches while Rete Ferroviaria Italiana is already implementing investments for 4 billion euros to enhance these connections; and the internal infrastructural works that are being carried out, as the "Third Pass" in Liguria, could favouring the train option instead of trucks as well as making the Italian calls more attractive (Morino, 2022a).

Another point on which Italy intends to intervene are the interports, in order to make goods flow more easily inland. These intermodal spaces outside the ports, where the passage of goods between trains and trucks can take place or vice versa, mean that the ports are relieved of load and that more and more goods can travel by rail if these places are well connected with ports, airports and industrial spaces (Morino, 2022b). This is why, as explained by the Minister of Infrastructure Giovannini, incentives have been renewed for those who decide to load goods on trains or ships instead of trucks (Morino,

2022b). Also according to Morino (2022b) and the same Minister Giovannini (2022), in the future we will see an increase in intra-European trade due to the great geopolitical and geoeconomic changes underway, with the pandemic crisis first and then with the war in Ukraine, in addition to the recent re-escalation of tensions between China and the United States on the Taiwan Strait (Morino, 2022b). Therefore the transalpine flow will increase and the interports will be fundamental to convey more and more traffic by rail instead by road (Morino, 2022b). Italy has already developed a unique network of 26 structured interports located along the strategic routes of European and international trade (Morino, 2022b). Unfortunately, these interports, such as Bologna, Padova, Verona, are currently serving mainly Italian companies that are going to ship their goods on the North Sea through the ports of Antwerp, Hamburg and Rotterdam. The railway connection with the other interchange nodes remains to be strengthened: for this reason the PNRR invests to connect 11 ports, 11 airports and 9 intermodal centres with the railway network, as reported by the Minister of Infrastructures (Morino, 2022b).

For Minister Giovannini (2022), Italy will be able to constitute a strategic platform on the Mediterranean also in view of the traffic increases in this area that unites Europe, Africa and Asia. For this reason, the Minister of Infrastructures aims not to limit port activity only as a point of arrival or passage of goods, which would bring limited value to the territories, but would like these areas to become areas of transformation and increase in value. Thinking of the corporate reshoring policies due to geostrategic tensions and unreliability of the supply chain in recent years, the port areas could attract many productive activities (Giovannini, 2022). From this point of view, the creation of the Zes and the infrastructural adaptation of the ports, in particular the connection to the network of the latter with the main transport routes, would allow Italy to become attractive for new investments and value creation in the territory (Giovannini, 2022).

The investments planned in Italy for ports are: 10 billion programmed in the Economic and Financial Document 2021 between state funds, PNRR and complementary funds, for the next 10 years to be invested to strengthen and innovate ports, but only 233 million come from PNRR and 1,2 billion are still to be found (Gerboni, 2021). In particular, almost two billion euros are expected to be spent by 2026 for the ports of Southern Italy:

"1.2 billion on ports and 630 million for the Zes"⁴⁰ as claimed by the Minister for the South Mara Carfagna (Viola, 2021).

Specifically in Italy, according to the Ministry of Infrastructure and Sustainable Mobility, the following are allocated with the Fund complementary to the PNRR:

"630 million in Zes, 700 million for the electrification of the docks, 1.47 billion for maritime accessibility and the resilience of infrastructures to climate change, 390 million for the increase in port capacity and 250 million for interventions on the last railway or road mile "⁴¹ (Foti, 2022).

In addition to this, all the internal works on the upgrading and new construction of railways and highways and interconnections between the focal points (ports, airports, interports, industrial areas) could bring a benefit both in terms of efficiency in the movement of goods both on attractiveness in ports. It remains "only" to complete this enormous process set up, if carried out it could lead to an effective leap in quality for our country in the international maritime commercial chessboard, Italy would become a great lighthouse at the centre of the Mediterranean, but we have to move, the other European states have already been running in front of us for too long!

⁴⁰ Vera, V. (2021), Carfagna: «Nel Pnrr stanziati 1,2 miliardi per i porti e 630 milioni per le Zes», Il Sole 24 Ore, 14/07/2021.

⁴¹ Foti, V. (2022), I porti moltiplicatori di sviluppo e carta vincente per la ripresa dell'Italia, la Repubblica, 02/03/2022.

Conclusion

We have therefore seen the main causes that have led to the disruption of global supply chains and what harmful effects they can have on the regular trend of trade, production and above all the important impact that they can produce on prices and inflation. Among the main causes we noted: the shortage of empty containers, the surge in demand after reopening and increased with public economic support, the low supply caused by manoeuvres on the capacity of fleets and blank sailing of shipping companies, ports and infrastructures inadequate to such massive waves of containers due to the stop and go of production. All this started following the first lockdown, yes, but which actually brought to light movements already in place and more structural, therefore contributing causes of the distortion in the supply chain.

In particular, this logistical crisis has led to an immeasurable increase in freight rates and costs of maritime and non-maritime transport, causing a significant increase in import and production prices and, in part, in final consumer prices. All this we can conclude has a more or less large inflation effect but certainly not negligible. Institutions should therefore be concerned with resolving the crisis in the supply chain as much as possible and regulating maritime, logistics and transport sectors as best as possible to avoid that the general economy pays for these market distortions and that the collective wealth is put at risk by a de facto oligopolistic market. Among the desirable actions we have seen: a stricter regulation on demurrage and detention fees; reduce the discretion to manage capacity in consortia and blank sailing for shipping companies; make shipping companies data as transparent as possible; create new infrastructures where they allow a more agile handling of goods and more sustainable minimum routes; expand competition in the transport and logistics sector. In particular, in Europe, it is asked to promote and adapt its core corridors and its core ports with a more super partes perspective that favours routes of minimum path so that transport costs for manufacturing could be as low as possible and the Green New Deal could be respected (Costa, 2022).

We have also seen how some trends in the world of maritime transport and logistics have changed or intensified following this period of shock and transformation. The

market concentration already underway for years has highlighted the fragility of such an oligopolistic and deregulated market. The commercial asymmetries have highlighted the logistical problems of handling empty containers. Geographical and income differences have highlighted the cost gap between rich and poor and isolated countries. We have thus seen some changes in response to these events. For example on public policies in the United States, where with the Ocean Shipping Reform Act 2022 they have begun to decrease the discretion of shipping companies: prohibition of blank sailing and discrimination in cargo, reversal of proof for any sanctions; with investments they want to unblock these bottlenecks for the future and strengthen other ports to expand competition in the sector. On company policies we have seen a different perception of long chains that are more advantageous for the cost of labour but more risky. Therefore solutions were sought closer or on safer routes. At the moment, therefore, we can speak of a regionalization effect of the markets, where possible, but not of deglobalization. What this work wishes is a collective awareness of the importance of maritime transport on firms and prices and of the fact that these margins that the transport and logistics sector makes could be reduced globally, both by better regulating the market both by looking for more rational and consistent routes with the environmental pollution objectives. In order to avoid unnecessary extra costs for businesses and families and trying to make the best use of resources for a more sustainable future. Especially thinking about the future, supranational and global coordination will be needed to decide together where to invest in order to obtain more eco-sustainable and convenient trade routes, holistically considering sea, port and land legs.

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