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The Impact of the Russia-Ukraine War on the Maritime Trade: Regional and Global Aspects

Mark Shipton

Preface

The Russian invasion to Ukraine on February 24, 2022, has created far reaching global changes, in both geostrategic and macroeconomic aspects. Most of these changes stem from the negative impact of the war on the global supply chain which is heavily reliant on the global maritime shipping industry. The war in the region had a direct effect on the maritime trade, mainly due to three reasons: the naval blockade of Ukrainian ports by the Russian Navy, the sanctions imposed against Russia by the international community, and the sharp increase in maritime shipping insurance rates.

Maritime trade in the Black Sea accounts for only 6% of the global total; nonetheless, these shipping routes still account for a substatial portion of the commodity market – 2.61% of crude oil, 11.8% of steel, 26% of grain, and 20% of corn. The ongoing conflict in the region has led to a considerable increase in the prices of these products; for example, the global price of grain increased in a span of one month by about 102%, which also led to an overall increase in market price indices for manufacturing, energy, and logistics. The fighting in the Black Sea continues to affect the global supply chain, contributes to price increases and the acceleration of global inflation, and is a testimony to the frailty of the global economic system in the era of globalization.

Background

Since the annexation of the Crimean Peninsula in 2014, the geostrategic situation in Southeast Europe has been accompanied by great tension. On February 24, 2022, after preliminary preparations, the Russian army invaded Ukrainian territory on several fronts; the Russian invasion is considered one of the largest conventional military offensives since World War II (Herb, Starr, and Kaufman, 2022; Lupsha, 2022). In the early days of the war, it became clear that the maritime domain is destined to play a significant role. The Russian naval force (The Black Sea fleet), having a quantitative and qualitative advantage compared to the Ukrainian forces, enabled Russia to establish an almost undisputed control over the Black Sea. Although the Russian Navy suffered considerable losses and casualties during the first months of fighting,[1] Russia continues to dominate this crucial domain (Shipton, 2022).

1 Russia lost the cruiser Moskva, its Black Sea Fleet flagship, to Ukrainian coastal missile strike during combat (Sands, 2022).

Russia's naval supremacy in the Black Sea constitutes as a major strategic advantage over Ukraine as it enables Russia the ability to conduct a myriad of military operations from the sea, e.g., launching stand-off precision land strikes and conducting amphibious operations. However, the most significant aspect is Russia's ability to enforce a long-term naval blockade againts Ukraine's shipping routes and ports, defacto a

complete shutdown of all exports and imports via Ukrainian ports (Jacobs, 2022). In this context it is important to note that before the war, maritime trade constituded 70% of Ukrainian trade activity(Murray, 2022).

Even though the war is fought in relatively confined geographic areas, the overall adverse effects on the gloabal economy remain significant.

Geographical review of the Black Sea

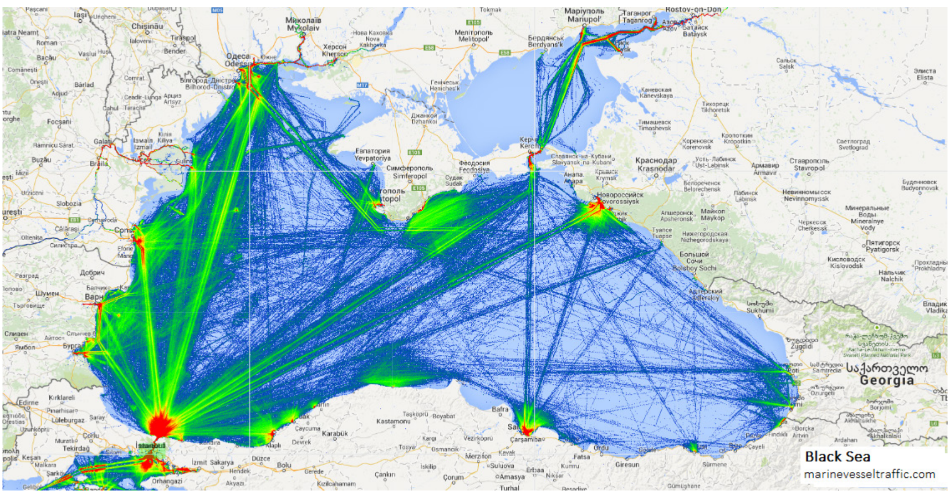

Figure 1: Ship traffic density in the Black Sea and main ports in the area (Yotsov, Dimitrakiev, Zaburtov, and Koritarov, 2017)

The Black Sea is a body of water spreading over 436,400 square kilometers, located on the borders of south-east Europe and west Asia. Six nations reside on the shores of the Black Sea: Georgia and Russia to the east, Ukraine to the north, Turkey to the south, and Bulgaria and Romania to the west.

There are sixty-five seaports along the Black Sea, the largest are Constanta in Romania (the largest port in the Black Sea), Odesa in Ukraine, Novorossiysk in Russia, Varna in Bulgaria, and Batumi in Georgia. The Black Sea is connected to the Mediterranean by two continuous straits, the Bosporus, and Dardanelles; these straitsare the Black Sea's only connection to the global oceanic system. It is important to note that the Black Sea also connects directly to the large rivers in eastern Europe: the Danube, the Dnieper, the Don, the Dniester, and the Kuban. These rivers allow relatively small vessels to transfer goods into central and eastern Europe (Dasgupta, 2022; Ports.com, 2022).

In the northeast, the Kerch strait connects the Black Sea to the Sea of Azov, a smaller body of water spreading over 39,000 square kilometers. Unlike the Black Sea which is relativaly deep (1,253 meters on average) (Black Sea Commission, 2009), the Sea of Azov is rather shallow (7 meters on average) (World Atlas, 2022), which limits the size of vessels that can sail it. The Sea of Azov is a focal point of intense combat between Russia and Ukraine due to its strategic location – its northwest coast is the only stretch of land separating Russia from the Crimea Peninsula; Russian control over that area would provide it with territorial continuity between sovereign Russia and the Crimean Peninsula, which was annexed in 2014 (France24, 2022).

A review of the Black Sea maritime trade

The Black Sea is an important transportation artery, connecting the surrounding nations (Russia, Ukraine, Georgia, Romania, Bulgaria, and Turkey[2]) to the global shipping trade routes.

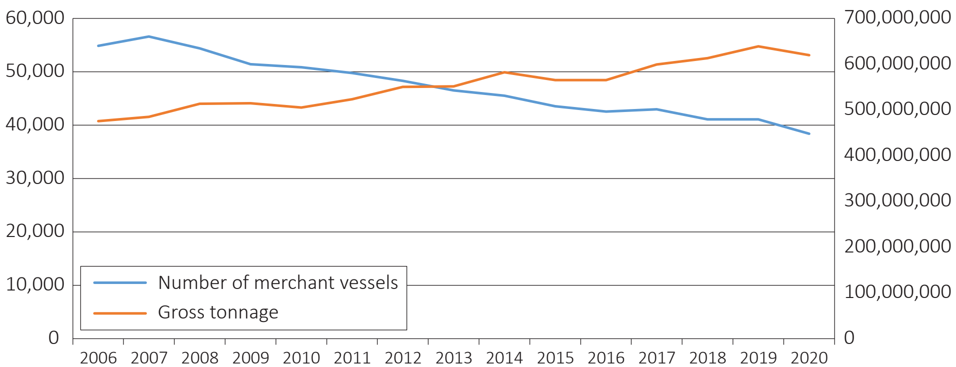

Figure 2: Merchant vessels and gross tonnage passing through the Bosporus Strait annually in numbers

According to Turkish authorities' data, since 2006, approximately 48,000 merchant ships passed through the Bosporus strait, carrying 600 million tons goods, annually.[3] A further

[2] Turkey has seaports in the Mediterranean as well, and therefore is not solely dependent on the Black Sea to connect to the global shipping trade routes. However, its Black Sea ports allow regionally focused importing and exporting with the other countries along the Black Sea shores.

[3] The Bosporus and Dardanelles are under Turkish sovereignty, hence, the Turkish Ministry of Transport carries out an annual monitoring of ship movement in these straits.

investigation of the data reveals a consistent decrease in the number of ships transiting the Black Sea each year (30% less, since 2006), alongside an increase in the gross tonnage. This overall trend is accomanied by an increase in the size of the ships sailing these waters (a 30% growth in gross tonnage, since 2006) (Açık and Atac, 2022; Küçükosmanoğlu and Küçükosmanoğlu, 2021). This is mainly due to the significant decrease in the number of general cargo ships passing through the Bosporus straits (a 49% drop, since 2006). Overall there has been the number of other types of vessels has remained (containers, tankers) and even incresed (bulk carrier traffic has increased by 58%, since 2006) (Açık and Atac, 2022).

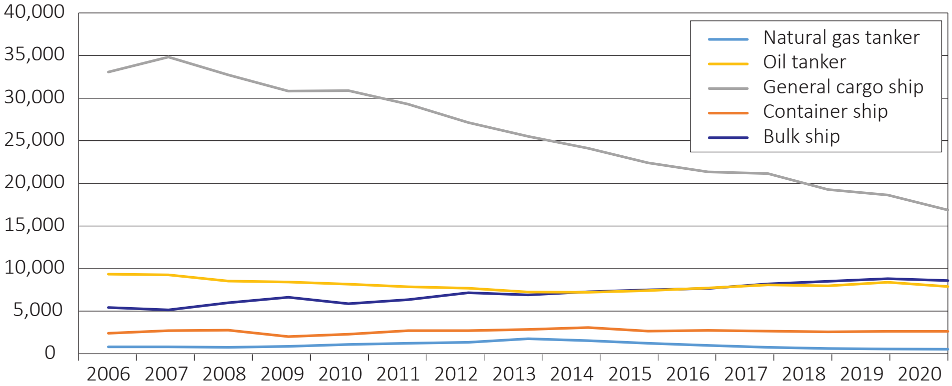

Figure 3: Annual ship traffic through the Bosporus Strait

Nowadays, the maritime trade in the Black Sea constitutes only about 6% of global total (Schnurr and Walker, 2019; Walker, et al., 2019). However, the shipping routes in this area are of great importance both regionally and globally. In the regional aspect, landlocked countries like Azerbaijan, Armenia, and Kazakhstan maintain trade connectivity, via neighboring countries, with Black Sea ports (Export.gov, 2019); For example, 20% of Kazakhstani oil is exported from the port of Novorossiysk in Russia (Evans, 2022). In the global aspect, the shipping routes in the area convey considerable percentage of the world's commodity market, originating from Russia and Ukraine (Lee and Durisin, 2022).

Additionally, the great rivers of eastern Europe flow to the Black Sea and to the Sea of Azov, enabling the ferrying of goods aboard smaller vessels or barges deep into eastern Europe. This is particularly noticeable in the Danube River, which transfers over 20 million tons of goods each year from the western regions of the Black Sea to landlocked countries, such as Serbia and Hungary (Danube Commission, 2021). Regarding land transportation routes, it must be noted that some of the countries on the western side of the Black Sea (Romania and Bulgaria) are members of the European Union, and integrated in the European railway network, which also enables the transportation of goods quickly and efficiently from the seaports on the western side of the Black Sea to markets throughout eastern and central Europe (ComparaBUS, 2022).

The impact of the Russia-Ukraine conflict on the shipping market and the maritime trade

The war has created three factors that disruptmaritime trade: the naval blockade of Ukrainian ports by the Russian fleet, the sanctions of the west against Russia, and the increase in insurance rates for shipping activities in the Black Sea.

The naval blockade of Ukrainian ports

The naval blockade enforced by the Russian Navy against Ukrainian ports and shipping lanes has led to a shift of Ukraine's maritime trade towards neighboring countries' ports, as well as the trade of other land-locked countries that depended on Ukrainian ports for export and import. It is worth noting, that until the war broke out, 70% of Ukraine's trade was conducted by sea (Murray, 2022). The shift of the maritime trade to ports of neighboring countries, mainly Constanta and Sulina in Romania, and Varna in Bulgaria, had resulted in an ever growing congestion of containers and general cargo in these ports, which sequentially led to a considerable price increase for shipping companies wishing to dock and operate in these ports. For example, the Constanta port authorities placed an additional 30 Euro fee for the repositioning of every container within port limits (Container News, 2022; Ernst, 2022; Savvides, 2022).

It must be pointed out that in the background, the fighing inland has also led to an additional indirect effect hampering maritime trade. The land trade routes between Asia and Europe to suspended operations. This also includes the CRE (China-Europe Railway Express) that passes through Russian and Ukrainian territories. This rail line is a significant trade route between China and Europe, carrying approx. 1.46 million containers each year. The cessation of the CRE has led to an increase in the volume of trade making its way between Asia and Europe by sea routes (Brinza, 2022; Siqi, 2022). Here, as well, an increase in demand compared to the existing supply leads to an increase in transportation fees.

The sanctions on Russia by the West

In response to the Ukraine invasion, the West imposed sanctions against Russian buisness entities; these sanctions induced major shipping companies, such as Maersk, MSC, CMA, and CGM, to declare that they would cease operating with Russian entities and no longer call Russian ports (Russu, 2022). This created an overload of cargo destined for Russia in many ports (mainly in Western Europe). Importers and exporters were compeled to store the said cargo in long-term logistic centers and port terminals, causing a shortage in logistic storage and an increase in service prices. Another aspect of the sanctions is the export of Russian oil, a decrease in supply in the oil market has led to a considerable spike in prices (which will be expanded on in the next section). This has also led to an increase in the price of petroleum products used as fuel for the shipping industry, such as VLSFO (Very Low Sulfur Fuel Oil), one of the most common fuels in the commercial shipping industry (Einemo, 2021); for example, according to UNCTAD (The United Nations Conference on Trade and Development), the VLSFO prices, in 2022, skyrocketed by 64% between January and the end of May, to over $1,000 per ton (UNCTAD, 2022). Naturally, an increase in the prices of ship fuel means an increase in naval transportation fees.

The increase in insurance premium rates for shipping activities in the Black Sea

The Russia-Ukraine war creates an inherant danger for civilian ships operating in the area. In the early days of the war, on the 24th and 25th of February, three merchant ships were damaged in the crossfire between Russian and Ukrainian navy forces; one tanker (*Millennial Spirit*) and two bulk ships (*Namura Queen* and *Yasa Jupiter*) (Bush, 2022; Reuters, 2022; Tanas, 2022). A week later, another bulk ship (the Helt) was hit and sunk, most likley due to a sea-mine (Kay, 2022a). The potential dangers to maritime trade led the IMO (International Maritime Organization) to set the risk level of activity in those ports to the highest – level III (IMO, 2022). In early March, the Joint War Committee[4] declared the entire northern region of the Black Sea, including the Sea of Azov, a high-risk area (MICA Center, 2022; Maritime Executive, 2022).

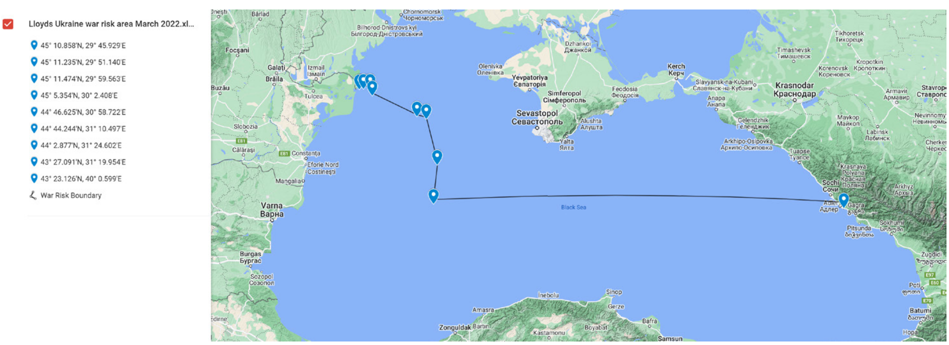

Figure 4: High-risk areas according to the Joint War Committee (Source: Maritime Executive, 2022)

4 The Joint War Committee (JWC) includes the underwriters of insurance companies, that provide insurance policies to shipping companies. The committee is focused on analyzing the dangers inherent in regional instability (combat, piracy, crime) and estimates the risk level in the region. These definitions, in term, determine the premiums that insurance companies demand from shipping companies operating in those areas (LMA, 2022).

The high-security risk has led to massive increases in insurance rates for ships that wish to operate in the area (up to 10% of the ship's value).[5] This even created unique situations where the insurance costs for a ship could actualy be higher than the costs of leasing the ship itself (Kay, 2022b; Koh and Nightingale, 2022). High insurance costs have led to a considerable increase in the prices of maritme transportation,. For example, in early 2022 the cost of transporting one million barrels of oil from Russia's Novorossiysk port to Italy was under $700,000. The price rose to about $3.5 million at the beginning of April (Koh and Nightingale, 2022).

Disruptions in the shipping market and maritime trade – a catalyst to an increase in the costs of raw materials

The ongoing conflict between Russia and Ukraine led to extensive disruptions in the shipping market and the maritime trade. The naval blockade of Ukrainian ports, the sanctions imposed against Russia, and the increase in insurance rates for merchant ships operating in the Black Sea, are considered as the main factors for the considerable increase in raw material prices. As previously mentioned, the Black Sea trade routes connect Russia and Ukraine to the global economic system; these countries are significant exporters of oil, agricultural produce, and steel, products that are an integral part of the commodities market.[6]

Petroleum

According to the United States Energy Information Administration, the global production of crude oil in 2021 was 95.57 million barrels a day (EIA, 2022), out of which 2.5 million barrels were exported from Black Sea ports, i.e., 2.61% of the total global oil supply. Most of the oil passes through three main ports in the eastern Black Sea: Supsa port in Georgia exports around 100,000 barrels of oil a day from Azerbaijan, Novorossiysk exports around 600,000 barrels of Russian oil a day, and the CPC terminal exports around 1.6 million barrels of oil out of Kazakhstan. A substantial amount of that oil is imported by Eastern European countries (Ukraine, Romania, and Bulgaria) that either use it or transport it to Central Europe by land routes (Lee and Durisin, 2022). As noted, the war has led many countries to impose sanctions on the import of Russian oil (i.e., a decrease in supply),

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5 Known as War Risk Premiums, they are determined by professional ship underwriters, in the service of big insurance companies, such as Allianz and Lloyd's (Kay, 2022b).

6 The commodities market deals in pricing and trading of raw materials that are later processed to consumer products, usually energy (oil, natural gas), metals (gold, silver, platinum) and agricultural produce (corn, wheat, cotton). An example of market tracking can be seen on the Bloomberg website.

this subsequently caused a significant and rapid increase of about 34% in oil prices: from $89 a barrel mid-February to $119 mid-March (Trading Economics, 2022b). It is worth mentioning that increasing oil prices also affect the prices of oil products such as gasoline, diesel, and LPG.

Agricultural produce

Russia and Ukraine account for 26% of global grain exports and 20% of corn, most of which is exported from ports to the global market aprrox. 80% of Ukraine's grain exports (and 99% of corn exports) are exported by sea. The main buyers of Russian and Ukrainian wheat are Egypt, Turkey, and Indonesia (Lee and Durisin, 2022; Manthey and Frentzos, 2022). The naval blockade of Ukrainian ports and the sanctions on Russian companies caused a significant disprution in the grain and corn markets. Firstly, a considerable increase in the global price of wheat ($332 in January to $672 in April, 102% increase) (GlobalEconomy.com, 2022) and corn ($583 in January to $809 in April, 38% increase). Secondly, nations that depended on wheat imports from Ukraine and Russia such as Egypt, Turkey, and Indonesia, were suddenly forced to look for new sources of grain. Thirdly, the high demand for grain and corn combined with the pressure of sanctions on the Russian economy have led in recent months to an increased volume of wheat exported in violation of the sanctions (Cook, Ivanova, and Pitel, 2022).

On July 27, 2022, the Black Sea Grain Initiative was signed, allowing the limited export of grian and other agricultural produce out of Ukrainian ports under international supervision, mainly to developing nations in the African continent suffering from a severe food security crisis (UN News, 2022). According to FAO (Food and Agriculture Organization of the United Nations), the initiative resulted in a slight decrease in the grain price index during the month of August 2022 (1.4%).[7]

Steel

According to the World Steel Association report, in 2021 the global steel export market was approximately 396.3 million tons. Russia is the second largest steel exporter in the world with over 31.5 million tons (8% of global exports), Ukraine is the ninth largest with over 15.2 million tons (3.8%). The combined gross of those two nations makes them the world's second largest steel exporter (46.7 million tons a year, 11.8%) after China (World Steel Association, 2021). The combination of sanctions against Russia and the blockade of Ukrainian ports severely limits the supply of steel, which had led to a considerable increase in steel prices, especially in Europe, which relies to a significant extent on

7 According to the FAO Food Price Index (FFPI), published monthly.

Russian and Ukrainian steel. The price spiked from $920 a ton to over $1,400, an increse of nearly52% (Spence, 2022).

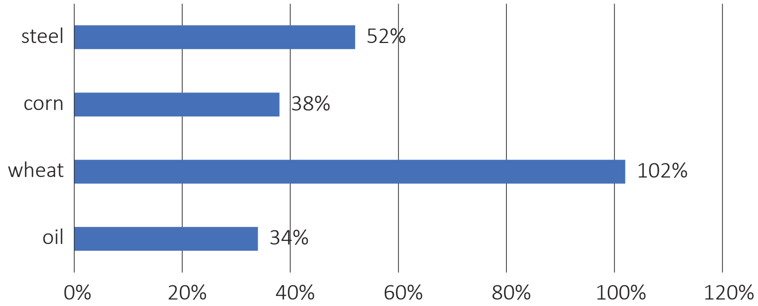

Figure 5: The increase in the price of raw materials after the outbreak of the war

Conclusion

The Russia-Ukraine war has led to significant effects on the global economy . These effects include extensive disruptions to the global supply chain, which is highly dependent on the maritime trade which accounts for transport 90% of all global trade (OECD, 2022). The increase in insurance rates, the sanctions on Russia and the naval blockade of Ukrainian ports hasd led to a price surge in the commodities market, which in turn led to an overall price increase for the entire consumer market, in aspects of energy, manafacturing, food, etc.

It must be noted that the conflict between Russia and Ukraine affected an already strained global market, following a long period of disruptions caused by the COVID-19 pandemic. Insurance giant Allianz claims that "the war is creating an additional burden on the maritime industry, which is already dealing with ongoing supply chain disruption, port congestion and a crew crisis caused by the pandemic". (Allianz, 2022). Meanwhile, the increase in raw material prices acts as a catalyst for global inflation; for the first time in 40 years, both the United States and Europe are suffering from an inflation of over 8% (Trading Economics, 2022a).

Despite recent achievements of the Ukrainian military in the eastern districts of Kharkiv and Donetsk (Applebaum, 2022) and the successful Ukrainian strikes against Russian vessels by coastal anti-ship missles and drones (Miller and McLeary, 2022), it is important to remember that the balance of power in the maritime domain still largely remains in Russia's favor. The Russian fleet continues to deploy large numbers of advanced military vessels in the region that enable the continuation on the naval blockade against Ukrainian ports. Accordingly, it would be true to conclude that as long as the war continues to rage on, disruptions of the global supply chain will continue leading to further price increases fueling the spiking inflation rates. Looking ahead, the most effective way to restore stability to the global economy will be regional or international collaborations and agreements, such as the Black Sea Grian Initiative.

The proccess of globalization over the past decades has enabled the integration of economic markets to an unprecedented level. This has led to increased competition, product diversity, high level customer service, as well as the quick and efficient transportation of goods all over the world.Nonetheless , the conflict between Russia and Ukraine remains a painful testimony to the adverse effects of globalization – as a war taking place in a relativaly limited geographic area has led to massive negative effects on the global market in a way that nearly every citizen in the world experiences.

References

Açık, A., and Atac, C. (2022). Estimating the ship traffic in the Istanbul Strait through economic growth of region countries. *BMIJ*, 10(1), 99–119.

Allianz. (2022, May). Impact of Ukraine war on global shipping. *Allianz Global Corporate & Specialty.*

Applebaum, A. (2022, September 11). It's Time to Prepare for a Ukrainian Victory. *The Atlantic*.

Black Sea Commission. (2009). Marine Litter in the Black Sea Region.

Brinza, A. (2022, March 1). Putin's War Has Killed China's Eurasian Railway Dreams. Foreign Policy.

Bush, D. (2022, February 24). Turkish bulker hit by bomb off Odessa. *Lloyds List*.

ComparaBUS. (Retrieved 2022, July 10). List of the train companies in Europe.

Container News. (2022, May 26). Blocked Ukrainian ports cause major congestion in the port of Constanta.

Cook, C., Ivanova, P., and Pitel, L. (2022, June 29). Ships going dark: Russia's grain smuggling in the Black Sea. *Financial Times*.

CPC – Caspian Pipeline Consortium. (Retrieved 2022, November 25). General Information.

Danube Commission. (2021, May 19). Cargo on the Danube. Presentaion.

Dasgupta, S. (2022, February 14). 8 Major Black Sea Ports. *Marine Insight*.

EIA. (2022, June 30). What countries are the top producers and consumers of oil? *US Energy Information Administration.*

Einemo, U. (2021, March 18). VLSFO: Fact Versus Fiction. *Ship & Bunker.*

Ernst, L. (2022, July 8). Constanta Port's container terminal jammed by traffic from Ukraine. *Romania Insider.*

Evans, D. (2022, June 4). Kazakhstan Renames Its Export Oil To Avoid Russia Sanctions Risk. *GCaptain*.

Export.gov. (2019, February 12). Armenia – Distribution & Sales Channels.

France24. (2022, March 1). The Azov Sea, symbolic prize of Russia-Ukraine war.

Herb, J., Starr, B., and Kaufman, E. (2022, February 24). US orders 7,000 more troops to Europe following Russia's invasion of Ukraine. *CNN News*.

IMO. (2022, July 9). Maritime Security and Safety in the Black Sea and Sea of Azov.

Jacobs, K. (2022). *Russia's war on Ukraine: Maritime logistics and connectivity* . Brussels: European Parliamentary Research Service .

Kay, G. (2022a, March 3). Two cargo ships hit by explosives off Ukraine following reports of Russia using vessels as a 'human shield'. *business insider.*

Kay, G. (2022b, April 12). Shipping companies in the Black Sea are reportedly facing war-risk premiums as high as $5 million. *Business Insider.*

Koh, A., and Nightingale, A. (2022, April 8). The Cost of Insuring Black Sea Shipping Is Out of Control. *Bloomberg*.

Küçükosmanoğlu, A., and Küçükosmanoğlu, Ö. A. (2021). Estimation of Vessel Passage throughBosphorus. *International Journal of Engineering & Applied Sciences*, 13(2), 56–70.

Lee, J., and Durisin, M. (2022, Feburary 26). Why the Black Sea Matters to Commodity Markets. *Bloomberg*.

LMA – Lloyd's Market Association. (Retrieved 2022, November 25). Joint War Committee.

Lupsha, J. (2022, February 28). Invasion of Ukraine—Biggest Military Attack Since WWII—Continues. *Wondrium Daily.*

Manthey, E., and Frentzos, K. (2022, April 6). Grains shipments from Black Sea ports slowly gain traction: sources. *S&P Global Commodity Insights*.

The Maritime Executive. (2022, March 8). Lloyd's JWC Expands War Risk Listing for Northern Black Sea.

MICA Center. (2022, March 7). Joint War Committee (JWC) adds Black Sea and Sea of Azov to JWC Listed Areas.

Miller, C., and McLeary, P. (2022, August 29). Ukraine has hobbled Russia's Black Sea Fleet. Could it turn the tide of the war? *Politico*.

Murray, B. (2022, January 27). Ukraine's Ports Brace for More Economic Hardship in Russia Conflict. *Bloomberg*.

OECD. (Retrieved 2022, April 20). Ocean shipping and shipbuilding.

Ports.com. (Retrieved 2022, September 27). Black Sea ports.

Reuters. (2022, February 25). Cargo ship Namura Queen hit by rocket off Ukraine – local agent.

Russu, C. (2022, May 13). How does the Russian invasion of Ukraine change shipping and freight rates? | Experts' Opinions. *Development Aid*.

Sands, L. (2022, April 18). "Sunken Russian warship Moskva: What do we know?", *BBC News*.

Savvides, N. (2022, April 22). New routes needed for Ukrainian freight as costs soar at port of Constanta. *The Load Star*.

Schnurr, R. E., and Walker, T. R. (2019). Marine transportation and energy use. In *Reference Module in Earth Systems and Environmental Sciences* (pp. 1–9). Amsterdam: Elsevier.

Shipton, M. (2022). Russia-Ukraine War – the Warfare in the Maritime Domain. Maritime Policy and Strategy Research Center, University of Haifa (Hebrew).

Siqi, J. (2022, March 6). What is the China-Europe Railway Express, and how much pressure is it under from the Ukraine crisis? *China Macro Economy*.

Spence, E. (2022, March 21). European Steel Prices Hit New Record on Prospect of Russian Ban. *Bloomberg*.

Tanas, O. (2022, February 25). Chemical Tanker in Black Sea Hit by Shelling, Crew Abandons Ship. *Bloomberg*.

The GlobalEconomy.com. (Retrieved 2022, June 29). Wheat price.

Trading Economics. (2022a, June 28). United States Inflation Rate; EU infaltion Rate.

Trading Economics. (2022b, June 30). Crude oil.

UN News. (2022, July 22). Black Sea grain exports deal 'a beacon of hope' amid Ukraine war – Guterres.

UNCTAD. (2022). *Maritime Trade Disrupted – the war in Ukraine and its effect on maritime trade logistics*. Geneva, Switzerland.

Walker, T., Adebambo, O., Feijoo, M. C., Elhaimer, E., Hossain, T., Edwards, S. J., . . . Zomorodi, S. (2019). Environmental Effects of Marine Transportation. In C. Sheppard (ed.), *World Seas: an Environmental Evaluation* (Chapter 27, pp. 505–530). Amsterdam: Elsevier.

World Atlas. (Retrieved 2022). Sea Of Azov.

World Steel Association. (2021). 2021 World Steel in Figures.

Yotsov, I. V., Dimitrakiev, D. Y., Zaburtov, A., and Koritarov, T. D. (2017). "Analysis of the Logistics Transport Corridors in Black Sea Region Based on the Short Sea Shipping Concept". *18th Annual General Assembly (AGA) of the International Association of Maritime Universities (IAMU), Varna: International Association of Maritime Universities*.

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