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The security of maritime energy transportation

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Evangelia Anastasia Basina

Abstract

Geopolitical matters around the maritime transportation of energy have been always alarming at a global level, let alone during tough times with escalated situations to unfold. Such can be considered the period in which people have been living since the end of 2019 – beginning of 2020. Starting from that time point and the landmark of COVID-19 outbreak, everyone could cogitate plenty of events which have been key contributors to the reformation of the maritime energy transportation map. The desideratum is to study if the energy transit by sea can remain secured at the end of the day and, if so, how it is attained. For this purpose, the literature is reviewed, the available data are monitored and assessed and finally the ongoing developments are observed and discussed. In this way, the present thesis is an endeavor to perceive that the need for the energy to keep flowing like the water comprises an international fundamental which is adhered by every party and at any stage of the trading process one way or another.

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Chapter 1: Introduction

1.1 The aim

Through my thesis in the security of maritime energy transportation, I aim at examining how the maritime transportation of energy always manages to remain alive and viable in the course of time while geopolitical tensions take place around the world. At this first stage, I would like to clarify that the term “energy” for the present study comprehends the oil and the liquified natural gas (LNG); thus, from now on whichever reference to energy is pertaining to these two energy resources. I wish to identify the ways (e.g. change of voyage routes of the vessels, utilization of the chokepoints, etc.) that the players of this sector find in order to adapt to the circumstances and continue the energy trade by water. Furthermore, it is fact that the various geopolitical factors affect the market as well as the trade in respect of: volumes of transported cargo, origin of cargo, importers/exporters of energy, bunker consumption of the vessels depending on the route they follow. This means that the maritime transportation may remain viable but not necessarily steady. That is why I will study the circumstances over the years comparing the volumes of the transported energy among the states before and after critical turning points, such as the Russia-Ukraine war, Israel-Hamas war and other momentous events. To be more precise, I am more interested in studying the period since 2019 and thereon in order to include crucial occasions –some of them still ongoing- which have an impact on my subject, like the Russia’s invasion of Ukraine in February 2022, the Israel’s invasion of the Gaza Strip in October 2023, the Houthis attacks in the Red Sea, the China-U.S. relations, etc.

1.2 Methodology

The methodology of this thesis is mainly qualitative, which means that it is based, to a certain extent, on academic literature collected from online libraries, scientific journals as well as minutes and forums of international entities. Thus, I endeavor to firstly approach the issue from a more theoretical scope presenting how geopolitics impact on maritime trade based on the available literature. However, to a relatively smaller extent, after the theoretical approach, relevant statistical data is also studied and analyzed so as to understand and explain the practical changes/trends observed in the energy trade before and after the various geopolitical events. For this purpose, indicators (Geopolitical Risk Index and Global Peace Index) are used and contribute to the commentary of the security of maritime energy transportation. The Geopolitical Risk Index serves as a metric for

assessing the impact of adverse geopolitical events and their associated risks. This index is derived by analyzing the frequency of newspaper articles that report on geopolitical tensions. Elevated geopolitical risk levels are indicative of potential declines in investment, stock market valuations, and employment rates. Furthermore, such heightened risk is correlated with an increased likelihood of economic crises and a greater potential for negative economic consequences on a global scale. These insights could further assist me to support the thesis. Besides, the Global Peace Index provides meaningful and useful data; by including it in my study I may give access to information related to the impact of violence as well as conflict trends and hotspots which can also explain the energy trends inter alia. Last but not least, having clearly declared it, I will include information from my work and from my attendance to forums to support this thesis.

1.3 Structure

This thesis is consisted of four Chapters. The first one is introductory; it provides an overview of the subject chosen analyzing the aim I wish to meet with this thesis, the methodology I followed in order to complete it, and finally its contribution to the scientific community. The second Chapter includes the literature review and thus, it reflects my theoretical approach to the subject. Chapter 3 studies two specific indicators and the findings derived from them in order to surround my subject with a practical perspective, too. The fourth Chapter ends up to this study conclusions and puts some potential concerns.

1.4 Contribution

This idea behind this thesis is to constitute a combination of a theoretical approach with a practical one in terms of the impact of geopolitics on the energy trade by water; thus, this study will enable us and the potential readers to realize how the parameters of the reality of the energy trade – the trade flows, the States' relations, the changing energy importers/exporters and the steady players, the prices and costs, the meaning of the chokepoints - are all interrelated each other. In this way, I think that I will succeed to create a comprehensive study which will provide a clear image of the scope of my interest. Given that I will include data of the current alarming situation, the thesis will be completely up to date and it can contribute to future studies as a link among the time periods in the sequence of events.

Chapter 2: Literature Review

2.1 Introduction

To begin with, I identify maritime transportation as a leading component of my thesis, as it is the means of the energy transportation under my study. I deem necessary to set the framework around the maritime transportation briefing on its history, explaining why transporting energy by sea is significant and analyzing the existence of the maritime chokepoints. It seems that these geographical features, the chokepoints, mean everything for energy transportation indeed. With their definition to be stated below, chokepoints explain the routes of the energy trading flows, the duration of the voyages of the ships used for the energy cargo transportation and, by extension, the relevant costs, as well as the grade in which the energy transportation can be secured. So, the more volatile the circumstances in the chokepoints are, the more affected the aforementioned factors are. The nine most pivotal chokepoints, according to the U.S. Energy Information Administration (EIA) (2024) and the World Economic Forum (2024), are presented further down.

By discussing on the security of maritime energy transportation, we advert to more than just one critical issue. More specifically, secure energy transportation means the feasibility of the energy to be traded unimpededly from the energy producing states to the energy consuming states. If we suppose that oil suddenly ceases to be exported by an exporting state for some reason, this fact would jeopardize the specific energy flow and the energy transportation overall. Then, the domino effect may start. The need of the importing state to buy energy from another producing country may arise, leading to possible new players in the energy trade market and deployment of other chokepoints. In fact, this hypothesis describes shortly the whole rationale around the security of maritime energy transportation, which, by the way, is more or less the real situation with Russia due to the sanctions imposed after Russia's invasion of Ukraine; it will be discussed later on.

2.2 The history of maritime transportation

Maritime transportation constitutes one of the oldest and most crucial modes of global trade and people traveling (Transportation Institute, 2024). Evolving from simple watercraft to sophisticated international shipping networks, it has played a pivotal role in the movement of goods across the world. Let us delve into the historical development of maritime transportation, from its early beginnings to contemporary times.

Maritime transportation has its roots in the dawn of human history when people first ventured onto the water. Early vessels, such as canoes and rafts, were used for fishing, trade, and exploration. Over time, advanced maritime technologies developed by ancient cultures like the Phoenicians, Greeks, and Romans served as a catalyst for the expansion of trade networks and the growth of empires across vast oceanic distances.

The Age of Exploration, spanning 15th and 16th centuries, revolutionized maritime transportation (Jean Brown Mitchell, 2024). The voyages of exploration undertaken by figures such as Columbus, Vasco da Gama, and Magellan resulted in the discovery of novel maritime routes to the Americas, Asia, and the Pacific Ocean. These discoveries facilitated the establishment of interconnectedness between continents, leading to a significant increase in international trade. This period can be considered the genesis of global commerce and fostered unprecedented exchange of cultural characteristics between previously isolated societies.

The Industrial Revolution of the 18th century significantly transformed maritime transportation (Virginia Dellino-Musgrave et.al, 2024). The advent of steam-powered ships dramatically reduced travel time across oceans and increased cargo capacity compared to traditional sailing vessels. This technological advancement contributed to the international trade and economic globalization.

The 20th century marked a period of significant advancement in maritime transportation, characterized by the development of diesel engines and the implementation of contemporary shipbuilding methodologies. These innovations culminated in a substantial increase in the efficiency and speed of vessels (Dr. Jean-Paul Rodrigue, Dr. Theo Notteboom, 2024). The construction of the Suez and Panama Canals facilitated the establishment of shorter and more direct maritime routes, exerting a profound influence on global maritime trade.

Nowadays, maritime transportation continues to be a cornerstone of the global economy, enabling international trade and the seamless movement of goods across the world. Each day, millions of tons of cargo—including raw materials, finished goods, oil, and other essential resources—are transported via sea routes.

What is more, the maritime transportation sector is undergoing a significant shift towards increased environmental consciousness, primarily driven by escalating concerns regarding CO2 emissions and their detrimental environmental impact. Shipping companies are actively engaged in substantial investments in innovative technologies and are actively developing low-emission vessels with the overarching objective of minimizing environmental footprint and fostering sustainable practices for future generations.

The history of maritime transportation constitutes a compelling narrative of human exploration, technological advancement, and evolution of society. From its humble origins with the first wooden boats to the intricate international maritime means of the present day, maritime transportation has been instrumental in fostering global interconnectedness and driving progress. While people keep up the exploration and innovation innovate within the domain of maritime transportation, we must strive to balance economic growth with environmental sustainability in response to the ever-evolving global landscape.

2.3 The global importance of maritime energy transportation

Reference is made to the global importance of energy transportation by sea. The transportation of energy resources by sea is a cornerstone of the modern global economy. According to the Review Report of maritime transport of the United Nations Conference on Trade and Development (2024), over 80% of volume of the global trade is shipped through international waters. Energy products were approximately 36% of global seaborne trade in 2021, with around 15% of coal, 17% of natural gas and 64% of oil produced globally moved by ship, as International Chamber of Shipping reports (2022).

The dependence on maritime routes for energy transportation is attributed to several factors, such as: the geographically dispersed nature of energy production (long distances between the producing/exporting countries and the consuming/importing countries), the high efficiency of sea transport for bulk commodities, and the limited capacity of land-based pipelines and transport networks.

Maritime transportation constitutes a driver of global energy trade by default. Energy exporters, rich in oil and gas resources but with limited domestic consumption, such as the Gulf states, Russia, and parts of Africa, manage to export their resources and these exports form a major part of their economic output and contribute to national revenue. On the other hand, energy importers, particularly those with limited domestic energy production like Japan, South Korea, and much of Europe, rely on maritime imports to meet their energy needs. Without access to reliable sea routes for oil and LNG, these nations would face significant energy shortages, potentially destabilizing their economies.

The volume of the energy transported by ships constitutes an important aspect of the significance of maritime transportation. In accordance with the U.S. EIA Report (2024), when it comes to the oil transportation, approximately 61% of the crude oil is transported worldwide by tankers. Major oil producing countries like Saudi Arabia, Russia, and the U.S.

export oil by sea to consuming nations, including China, Japan, and Europe. Oil tankers are specially designed to carry massive quantities of crude oil or refined products, and as a result maritime shipping offers a cost-effective and flexible means to move this energy across vast distances. With global demand for natural gas rising, particularly as a cleaner alternative to coal, LNG has become a crucial energy commodity. LNG carriers transport gas from key exporters like Qatar, Australia, and the U.S. to regions where natural gas is in high demand, such as Europe and East Asia (U.S. EIA, 2024). As analyzed by the U.S. Department of Energy, LNG carriers are engineered for the transportation of LNG through a process involving cooling, reaching temperatures as low as $-162\text{ }^{\circ}\text{C}$ ($-260\text{ }^{\circ}\text{F}$). This process results in a substantial volume reduction of LNG, achieving approximately 1/600th of its original volume in its gaseous state; this renders maritime LNG transportation cost-effective as well. The flexibility of LNG transported by sea helps countries diversify their energy sources.

Another major aspect of the maritime transportation importance is that it ensures the global energy security and economic stability to a certain extent. Many industrialized nations are heavily dependent on energy imports, especially oil and gas. For instance, Europe relies on sea-based imports of LNG to reduce dependence on pipeline gas from Russia. East Asia, including Japan and South Korea, are highly reliant on sea-borne energy imports, making maritime transportation critical to their economies. Also, since the world economy is dependent on the continuous and secure flow of energy, any disruption to maritime transportation can cause significant economic instability. Events like the blockage of the Suez Canal or attacks on tankers passing through the Strait of Hormuz highlight the vulnerability of sea routes.

Moreover, the strategic chokepoints, which major energy shipping routes pass through, secure the global trade interdependence since any product can arrive from wherever to wherever by sea. But what happens in cases that chokepoints are blocked? Is the transportation jeopardized? And if so, how? This is analyzed rigorously throughout the present thesis.

It is indisputable that the maritime transportation is cost-effective achieving economies of scale (Emanuele Ferrari et al., 2023). Shipping by sea allows the movement of massive quantities of energy at relatively low costs compared to other modes of transportation, such as air or road. Large oil tankers and LNG carriers can transport vast amounts of energy in a single journey, reducing per-unit transportation costs and making sea transport economically viable for long distances. Besides, the energy market is flexible globally since the ability to ship energy resources by sea provides nations with flexibility in sourcing their energy needs (Ioannis N.Lagoudis et al.,2010). For example, a disruption

in one supply source can be mitigated by redirecting ships from other parts of the world, ensuring that markets remain supplied despite local disturbances.

Last but not least, the said type of energy transportation keeps the supply chain integrated with the refining and distribution to take place efficiently. Much of the world's refining capacity is located near key shipping hubs, where crude oil can be easily imported and then exported again as refined products (Statista, 2024). Ports equipped to handle energy cargoes are strategically positioned to link global production centers with consumer markets. This creates an integrated supply chain that underpins global trade in refined products like gasoline, diesel, and jet fuel.

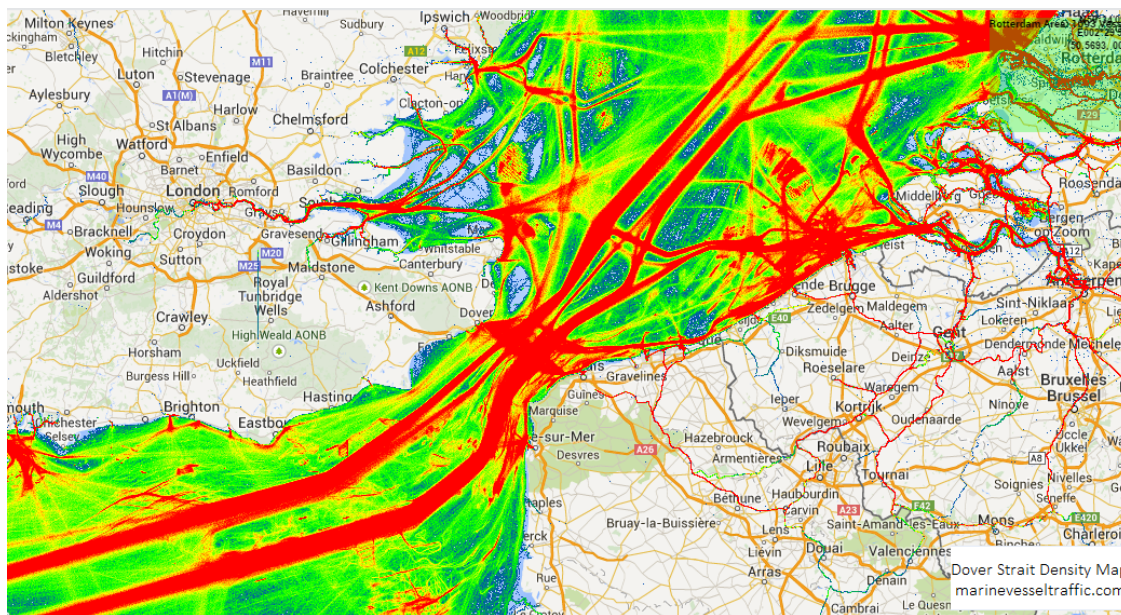
2.4 World Transit Chokepoints

Rob Bailey and Laura Wellesley define maritime chokepoints as “critical points along transport routes that facilitate the passage of substantial trade volumes, which serve as vital arteries for global trade, connecting important regions across the world” (2023). “Chokepoints are narrow channels along widely used global sea routes that are critical to global energy security” (U.S EIA, 2024). Certain chokepoints exhibit significant navigational constraints, necessitating restrictions on the dimensions of vessels permitted to traverse them. Owing to the substantial volumes of petroleum, other liquid hydrocarbons, and liquefied natural gas transported through these narrow Straits, they constitute critical elements of global energy security. The reliable function of international energy markets is contingent upon the uninterrupted flow of maritime transport. Even temporary disruptions at a major chokepoint can result in substantial delays in supply chains and escalating shipping costs, ultimately contributing to elevated global energy prices. While alternative routes may exist for circumventing most chokepoints, these alternative routes typically incur significantly longer transit times. Furthermore, some chokepoints lack viable alternative routes. Recognizing their paramount importance as global maritime trade arteries, the following ten chokepoints are integral components of major seaborne oil transportation routes. Their description is mainly based on the World Economic Forum data (2024). Parameters such as oil prices, ton-miles are affected when disruptions happen to these points.

2.4.1 English Channel

This Channel is one of the busiest ocean shipping lanes worldwide. It serves as a critical maritime corridor, facilitating daily transit for over 500 vessels navigating between the North Sea and the Atlantic Ocean, as well as between the United Kingdom and continental Europe. Annually, the Channel accommodates the passage of more than 16 million passengers and 5 million commercial vehicles across its network of approximately 170 ports and harbors. Key port facilities within this network include Portsmouth, Le Havre, Cherbourg, and Brest.

Figure 1. English Channel



Source: World Economic Forum, 2024

2.4.2 Strait of Malacca

According to the World Economic Forum data (2024), the Strait of Malacca, interconnecting the Indian Ocean and the Pacific Ocean, is the shortest sea route between oil exporting countries of Middle East and consuming countries in East and Southeast Asia. As we can see in Figure 2, alternative maritime routes to the Strait of Malacca encompass two narrower chokepoints situated within the Indonesian archipelago in the Pacific Ocean: the Sunda Strait and the Lombok Strait. Annually, the Strait is passed through by approximately 94,000 vessels. This Strait constitutes the most important primary chokepoint in Asia as well as the largest chokepoint worldwide in terms of oil

volume transported. Crude oil constitutes approximately 70% of the annual oil flow through this chokepoint, with petroleum products comprising the remaining volume. Furthermore, this critical maritime passage facilitates a significant portion of LNG transit from suppliers in the Persian Gulf and African regions, notably Qatar, to East Asian nations experiencing substantial growth in LNG demand. Key importers of LNG within this region encompass Japan, China, and South Korea.

Increased congestion and more and more collisions are being observed in the Strait; its capacity is estimated to be exceeded by 2030 as shipping traffic is increasing continually. With the aim of Strait dis-congestion, there is a proposal from Thailand for a 100km land bridge at the narrowest part of the Malay Peninsula, where goods would be discharged in order for their transportation to be continued by other means, such as train or trucks. This would permit vessels to bypass Singapore and Malaysia. (World Economic Forum, 2024)

Figure 2. Strait of Malacca



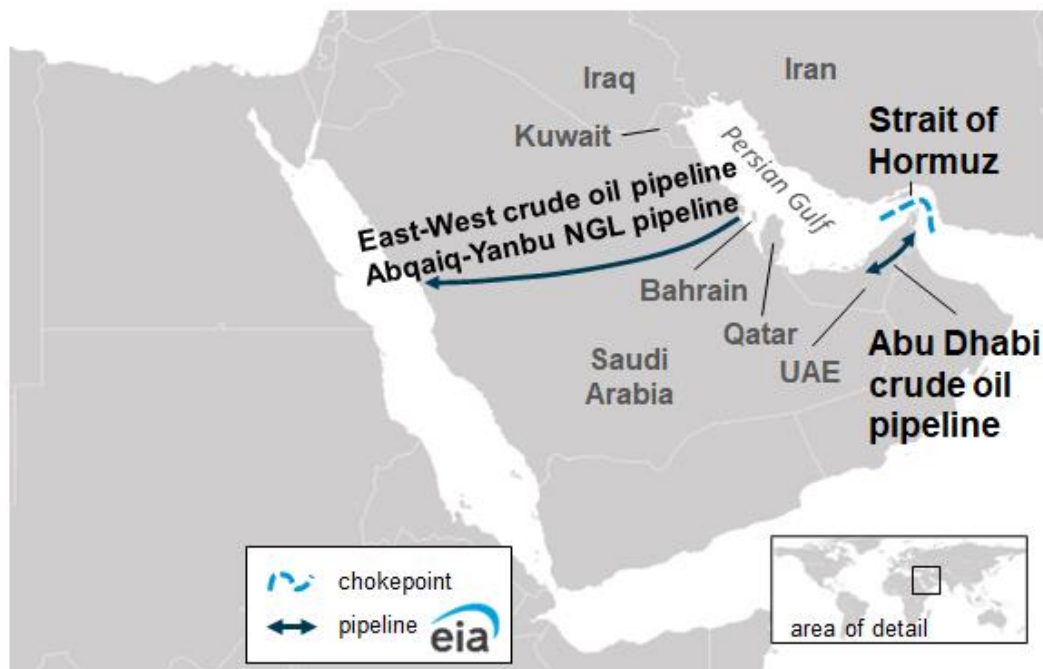
Source: U.S. Energy Information Administration (EIA), 2024

2.4.3 Strait of Hormuz

Figure 3 displays the Strait of Hormuz, located between Iran to the north and UAE and Oman to the south, links the Persian Gulf, the Gulf of Oman and the Arabian Sea. The Strait of Hormuz possesses sufficient depth and width to accommodate the world's largest crude oil tankers. As the primary maritime route for Middle Eastern oil exports, the Strait facilitates the transit of approximately one-fifth of global oil consumption, amounting to nearly 21 million barrels per day, according to recent World Economic Forum data. Consequently, it makes sense to be ranked among the world's most critical oil chokepoints. Significant volumes of oil and liquefied natural gas traverse the Strait, with limited alternative routes available for their transportation in the event of a closure.

The Strait operates under a two-lane traffic system in order for the cargo capacity to be managed more effectively and collisions to be avoided. The one lane is used by inbound vessels whilst the second one is used by the outbound ones.

Figure 3. Strait of Hormuz



Source: U.S. Energy Information Administration (EIA), 2024

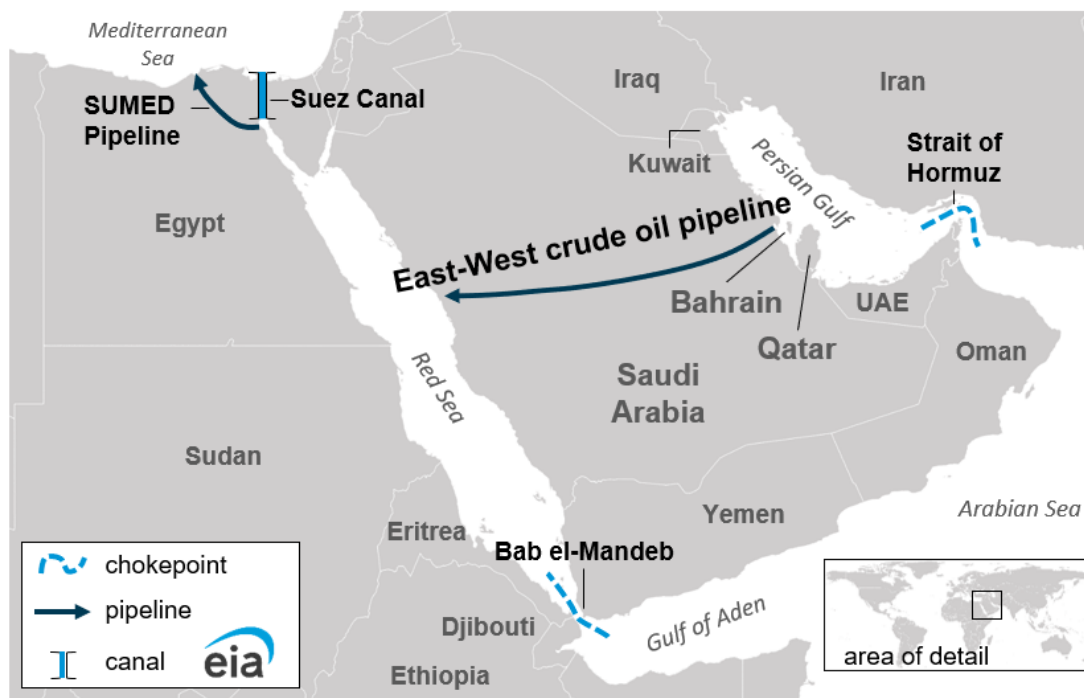
2.4.4 Suez Canal

The Suez Canal, situated in Egypt, serves as a vital maritime link between the Mediterranean and Red Sea, concurrently delineating the boundary between Africa and Asia, as illustrated in Figure 4. As the most expedient maritime route connecting Europe and Asia, the Suez Canal enables vessels to circumvent the significantly longer voyage around the Cape of Good Hope at the southern tip of Africa, thereby facilitating substantial reductions in shipping costs.

2.4.5 Bab el-Mandeb

The Bab el-Mandeb Strait, located between the Horn of Africa and the Middle East, serves as the critical maritime link connecting the Red Sea to the Gulf of Aden and the Arabian Sea. A significant proportion of petroleum and natural gas exports originating from the Persian Gulf destined for European and North American markets come through these crucial chokepoints: the Suez Canal, the Bab el-Mandeb Strait, and the Strait of Hormuz. Both the Suez Canal and the Bab el-Mandeb Strait function as strategically vital transit corridors for the movement of oil and natural gas shipments from the Persian Gulf to European and North American destinations.

Figure 4. Suez Canal, Bab el-Mandeb



Source: U.S. Energy Information Administration (EIA), 2024

2.4.6 Danish Straits

While the Strait of Hormuz and the Strait of Malacca are frequently identified as the most critical chokepoints for global energy trade, the Danish and Turkish Straits hold significant strategic importance for specific regions as well. The Danish Straits, a series of channels connecting the Baltic Sea to the North Sea, constitute a crucial maritime route for the export of Russian energy resources to European markets. Moreover, they serve as a vital conduit for trade flows to and from the Baltic states, as well as for trade originating from or destined for Russia via the Gulf of Finland.

As the Figure 5 depicts, the Danish Straits comprise three general areas, the Skagerrak, the Kattegat, and the island passageways (including Öresund, as Figure 6 depicts - three miles wide at Helsingör- and the Great (Store) Belt. Same is explicitly explained by the U.S. Naval Institute.

Figure 5. Danish Straits - I



Source: Wikipedia.

<https://www.openwaterpedia.com/wiki/Kattegat>

Figure 6. Danish Straits - II

Danish Straits maritime chokepoints



Source: U.S. Energy Information Administration (EIA), 2024

2.4.7 Turkish Straits

The Turkish Straits, comprising the Bosphorus and Dardanelles passages (alternatively known as the Istanbul Strait and the Çanakkale Strait respectively), serve as the geographical boundary between Asia and Europe, as well as the Black Sea and the Aegean Sea, as depicted in Figure 7. The Bosphorus, a 17-mile waterway, connects the Black Sea to the Sea of Marmara, while the Dardanelles, a 40-mile passage, links the Sea of Marmara to the Aegean and Mediterranean Seas. These Turkish waterways serve as a crucial conduit for the transportation of oil from Russia and the Caspian Sea region to Western and Southern European markets.

Renowned for their intricate geography, the Turkish Straits present significant navigational challenges. Annually, approximately 48,000 vessels transit these straits, establishing them as one of the world's busiest maritime chokepoints. During periods of peace, commercial vessels possess the right of unimpeded passage through the Turkish Straits, notwithstanding Turkey's inherent right to implement regulations designed to ensure maritime safety and environmental protection.

Figure 7. Turkish Straits



Source: U.S. Energy Information Administration (EIA), 2024

2.4.8 Panama Canal

The Panama Canal is displayed on Figure 8, where it appears to connect the Pacific Ocean with Caribbean Sea and the Atlantic Ocean. Having length of 50 miles, it has constituted a waterway with enormous significance since its construction back in 1914. As explained by the U.S. EIA, the unique geographical characteristics of the Panama Canal, combined with its operational philosophy, necessitate the utilization of a lock system to facilitate the elevation and lowering of vessels during their transit across the waterway. Over time, the canal has undergone significant expansion projects, enabling it to accommodate larger vessels and thereby offering a more efficient alternative to the considerably longer voyage around Cape Horn at the southernmost tip of South America.

Travelling through the alternative routes, the Straits of Magellan, Cape Horn, and Drake Passage at the southern tip of South America, would take much more time, be more costly, adding up to 8,000 miles of travel or, in the case of going around South America, and even more risky as they would include transiting dangerous waterways. Other alternative routes would be going eastbound around the Cape of Good Hope in South Africa or passing the Suez Canal.

Figure 8. Panama Canal



Source: U.S. Energy Information Administration (EIA), 2024

2.4.9 Strait of Gibraltar

The Strait of Gibraltar, representing the shortest maritime passage between Africa and Europe, serves as a crucial link between the Mediterranean Sea and the Atlantic Ocean, thereby facilitating connections between major global economies. The strait holds significant strategic importance, particularly in facilitating the transportation of crude oil and LNG, primarily destined for European markets. According to a report of the British think tank, Chatham House (2017), the aforementioned chokepoint had been free from disruptions over the period between 2002 and 2017 and it seems that same is applicable for the period after 2017 until today.

Figure 9. Strait of Gibraltar

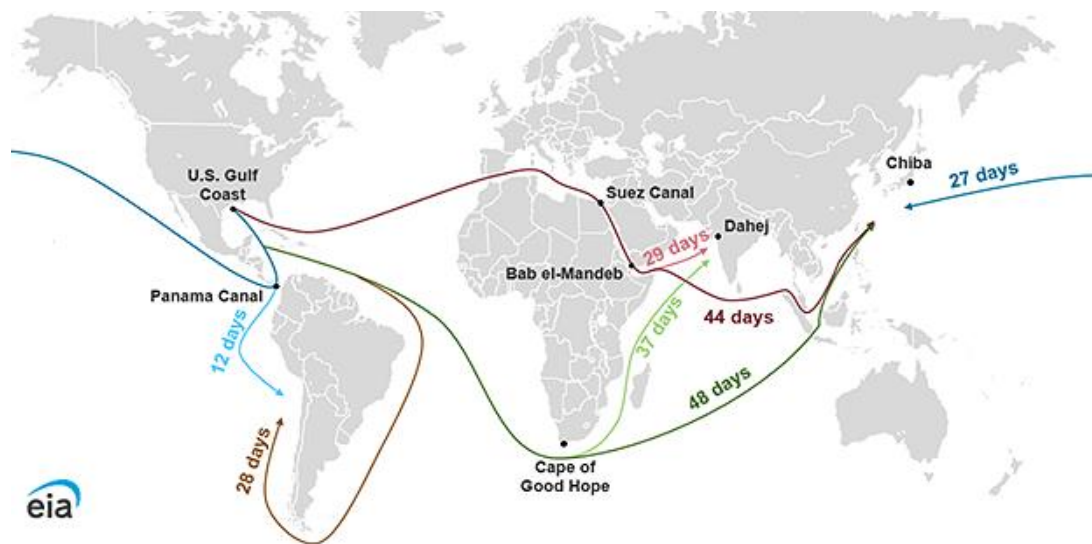


Source: <https://www.alamy.com/>

2.4.10 The Cape of Good Hope

Actually, the Cape of Good Hope would not be regarded as an actual chokepoint as all the aforementioned with the meaning of a narrow Strait or an artificial Canal. However, situated on the southernmost extremity of the African continent, it serves as a pivotal global trade route and a critical transit point for tanker shipments traversing the globe. Besides, it constitutes the primary alternative route for vessels which travel westbound and it is not desirable for them to pass from the Gulf of Aden, Bab el-Mandeb Strait, and the Suez Canal. Of course, this is not only a major deviation in respect of time/distance for the vessels but it is also more expensive route as it hikes the shipping costs up. More specifically, diverting around the Cape means adding 15 days more or less to arrive from the Arabian Sea to Europe, along with increasing costs and delaying shipments. Figure 10 shows the calculation of voyage time of the vessels following the various shipping routes. The calculation has been made for very large gas carriers at a laden condition sailing at speed of 14 knots without extended chokepoint delays.

Figure 10. Shipping routes from U.S. Gulf Coast to Asia and Western South America

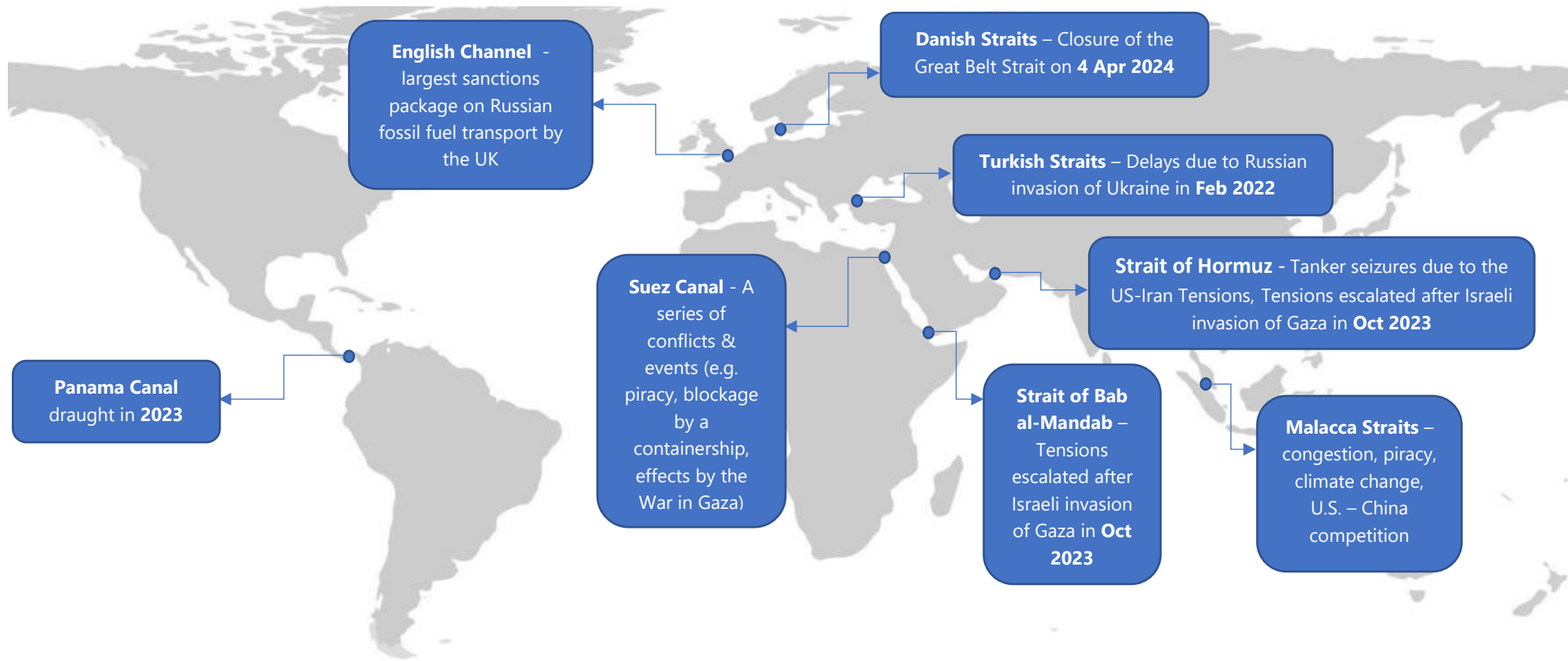


Source: U.S. Energy Information Administration (EIA), 2024

2.5 Recent and/or ongoing chokepoints disruptions

Based on the idea from the British think tank, Chatham House, Figure 11, presented below, was created to display the geopolitical chokepoints where disruptions have been recently taken place or they are still in progress. These are hereby analyzed further. First of all, given that the period of study for the present thesis begins from the end of 2019 – beginning of 2020, COVID-19 outbreak cannot help but to be taken into account despite the fact that I am not referring to it in any of the boxes on the below map. I have chosen not to do so since the pandemic was such an unprecedented situation in our time with totally global impact that every dimension (e.g. society, economy, state) and every market sector across every longitude and latitude was paralyzed either for a longer time period or for a shorter one. In a nutshell, I wish to elaborate that it is indisputable that the maritime energy transportation was greatly affected as well. The multidimensional restrictions and difficulties were rather than few. The circumstances around health of the crew members onboard and the workers at the terminals/ports, the global lockdowns and port closures mainly were requiring much response time for solutions to be found. However, the truth is that ships never stopped carrying energy and sailing. And this is the reason why life was practically continued. The extreme situation of COVID-19 could be regarded as an indication of no matter how much the maritime energy transportation is jeopardized, the conclusion may be that the applicable ways are always found in order for it to be safeguarded. This view is retained for further consideration along this thesis.

Figure 11. Recent and/or ongoing chokepoints disruptions



Source: The gray map in background was sourced from Vecteezy.

As we can see on Figure 11, the English Channel and the Turkish Straits are two of the most important maritime chokepoints which were affected by the Russian invasion of Ukraine which took place on 24 February 2022. According to the article of the author Mike Schuler (2024), the UK government, willing to support the enforcement of the sanctions against Russia due to its war in Ukraine, took strict measures aiming at the "shadow fleet" of oil tankers whose operations continue with dubious insurance.

One week before, the UK had escalated its sanctions regime against Russian fossil fuel transportation, imposing restrictions on eighteen oil tankers and four liquefied natural gas carriers, bringing the total number of sanctioned vessels to forty-three. Concurrently, the UK government has intensified efforts to counter Russian-backed maritime activities within its territorial waters.

A collaborative initiative involving the Department for Transport, the Joint Maritime Security Centre (JMSC), and the Maritime and Coastguard Agency (MCA) is currently underway to scrutinize vessels suspected of operating within the Russian "shadow fleet" as they transit the English Channel. Vessels exhibiting questionable insurance coverage are mandated to provide detailed documentation pertaining to their insurance status, thereby ensuring compliance with international safety regulations.

The UK government has adopted a more assertive stance in enforcing maritime sanctions against Russia. Any entity providing support to Russian maritime activities may be subject to punitive sanctions. The Russia (Sanctions) (EU Exit) Regulations 2019 impose stringent restrictions on sanctioned vessels, encompassing port bans, movement restrictions, potential detention, and removal from the UK Ship Register. Despite these measures, the effective enforcement of these sanctions remains a significant challenge. Reports indicate that nearly a third of the vessels sanctioned by the US, EU, and UK have resumed operations, highlighting the ongoing struggle between international regulatory bodies and the evolving tactics employed by the Russian shadow fleet.

As far as the Turkish Straits are concerned, the same policy regarding the insurance coverage for vessels trading with Russian ports had been already adopted by Turkey since 1 December 2022 since the influence of the war to the latter is direct owing to the fact that Black Sea to Mediterranean Sea can be linked only through the Turkish Straits. More specifically, as "The Marine Insurer" journal describes, the Turkish Ministry of Transport and Infrastructure issued a notification. According to it, vessels that transported crude oil and oil products through Turkish waters were required to present letters of confirmation from their P&I (Protection and Indemnity insurance) Clubs (2022). This requirement, entered into force from December 1, 2022, aimed to mitigate risks associated with international sanctions. The notification mandated that P&I Clubs confirm continued insurance coverage for vessels, even in scenarios where the ship owner might violate sanctions. However, P&I Clubs and liability insurers were objected to this wording, arguing that it could expose them to liability and potentially grant them grounds to cancel or terminate policies. The disagreement led to significant delays and congestion in Turkish waters as vessels awaited clarifications. Following negotiations between stakeholders and Turkish authorities, a compromise was reached on the wording of the required letters. This agreement permitted the traversal of crude oil tankers through Turkish waters and Straits.

To continue the explanation of Figure 11, reference is made to the Danish Straits and their closure on 4 April 2024. As it is reported in the media outlet Deutsche Welle (2024), Danish military authorities temporarily closed the Great Belt Strait to both maritime and air traffic due to a missile malfunction. The incident occurred approximately 5-7 kilometers south of the Great Belt Bridge, which remained unaffected. As the military stated, during a routine test, a missile launcher was inadvertently activated and could not be immediately deactivated. This posed a risk of an accidental missile launch within a few kilometers. The closure lasted several hours. The Strait is one of the most significant waterways around the world, as it is the major route for Baltic Sea access. Significant disruption would have critical consequences for the global trade.

In addition, the Suez Canal, the Strait of Bab al-Mandab as well as the Strait of Hormuz constitute another group of maritime chokepoints which are all directly affected by the Israeli invasion of Gaza in 7 October 2023, although they had already accepted other strikes as well prior to this invasion. It is important to mention that the area Suez Canal – Red Sea - Bab al-Mandab Straits - Strait of Hormuz had been named the Indian Ocean High Risk Area (HRA) from a piracy perspective until 1 January 2023, when its removal came into force, as the International Chamber of Shipping explains. This means that until then, this region had suffered from piracy attacks.

When it comes to the Suez Canal individually, the 2021 grounding of the Ever Given, one of the world's largest container ships, in the former Canal for six days severely disrupted global shipping, resulting in an estimated daily trade freeze of nearly \$10 billion, as Vivian Yee and James Glanz wrote in the New York Times (2021). On 25 March 2021, while Ever Given was still stuck, the secretary general of the International Chamber of Shipping, Guy Platten, admitted that this type of incident was uncommon, and it is reassuring that there were no injuries to the crew or environmental pollution, expressing his hope the Ever Given would be refloated soon to restore normal operations in this crucial waterway. He added that the global economy relies heavily on the maritime industry to supply goods worldwide. The Suez Canal incident has highlighted the vulnerability of these global supply chains. As it is a critical chokepoint for trade between Asia and Europe, the Suez Canal incident underscores how a single unforeseen event can disrupt the delicate balance of global commerce. Approximately 12% of global trade, amounting to over one billion tons of goods annually, transits the Suez Canal. This includes essential items such as medical equipment and personal protective equipment. The Ever Given incident caused significant delays for the vessel's cargo and hundreds of other ships. The disruption to the global supply chain had far-reaching consequences.

Furthermore, posing additional concerns, Paul Bartlett analyses in the Economist that the escalating civil war in Sudan could lead to further disruptions in global trade through the Suez Canal (2024). The ongoing conflict in Sudan, Africa's third-largest country, is largely overlooked by global media, despite the devastating human cost. The Economist reports that up to 150,000 people have been killed, and millions have been displaced. Sudan's porous borders with neighboring fragile states, including Chad, Egypt, Ethiopia, and Libya, exacerbate the situation. The conflict poses significant risks to global trade. Sudan's 800-kilometer coastline on the Red Sea, a critical shipping route between Asia and Europe, makes it a strategic location. Any disruption to this waterway could have severe consequences for international commerce.

The Economist reports that the Sudanese conflict is fueled by external actors, including Russia and Iran, who seek to establish a Red Sea naval base in exchange for arms. A potential descent into anarchy or the emergence of a hostile regime could further endanger the Suez Canal, a critical global trade route. Currently, the disruptions in the Red Sea are derived from Houthi attacks from Yemen bases. However, a destabilized Sudan could enable similar attacks further north. Port Sudan, a major port, is situated across the Red Sea from Saudi Arabia's growing port of Jeddah. Last but not least, the Sudan conflict also has wider consequences, including a potential new refugee crisis in Europe. Migration is a sensitive issue in many countries, and Sudanese refugees constitute a significant portion of those in camps like Calais, on the English Channel.

Another beleaguered chokepoint of the region is the Straits of Hormuz. As explained in the Global Conflict Tracker (2024), in spite of the fact that four decades have passed since the 1979 Iranian Revolution, the relations between United States and Iran remain tense. Iran's continued nuclear program and support for regional militant groups, despite U.S. efforts to counter them, remain significant concerns. The October 2023 conflict between Israel and Hamas heightened fears of direct U.S.-Iran confrontation to a level not seen in years. In April 2024, tensions between Iran and Israel escalated significantly with Iran launching an unprecedented direct missile and drone attack on Israel. This followed an Israeli airstrike targeting Iranian military officers in Syria. This escalation raises serious concerns about potential spillover effects into existing regional conflicts in Syria, Yemen, and Iraq, posing a significant threat to U.S. personnel and interests in the region. The phenomenon repeated is the attempted tankers seizures tankers from Iran in the Straits of Hormuz, a crucial passage for oil exports from the Middle East, raising risks and costs for vessels transiting the area. The most recent incident occurred when the U.S. naval forces intervened and avoided two attempted seizures by the Iranian Navy in the Gulf of Oman. These incidents involved Iranian vessels firing upon commercial tankers in international waters. (Harry McNeil, 2023)

The Israeli invasion of Gaza has brought the notorious Houthis attacks in the Bab al-Mandab which hit the international trade. Vessels are forced to bypass the Suez Canal and navigate around the Cape of Good Hope due to the continuing disruptions in the Red Sea. The consequences of this longer route are the increased transit time, higher and higher operational costs, which are obviously borne by the final consumers, and add environmental strain due to higher fuel consumption and increased sailing speeds, as explained in the Review Report of maritime transport (2024).

As far as the Strait of Malacca is concerned, the threats in this region vary and they are described by the National Bureau of Asian Research following an interview with Dr. Kaewkamol Pitakdumrongkit (2023). The approximately 90,000 ships that transit Malacca Strait yearly incur congestion, which in turn brings navigational hazards. Collisions have as a result the delays or disruptions of the products transportation and even worse the environmental pollution. Piracy constitutes the second threat. It is fact that since 2006, a decrease in the piracy attacks and robberies had been noted. However, it seems that they have recently increased again. In accordance with the Regional Cooperation Agreement on Combating Piracy and Armed Robbery against Ships in Asia Information Sharing Centre (ReCAAP ISC), until the mid of 2023, thirty-eight piracy attacks had been counted; this is reflected to a 41% rise of such incidents in comparison with 2022. Piracy makes navigation even more challenging and it can hold

the trade flow back in the area. What is more, environmental threats derived from climate change and global warming are responsible not only for the more and more frequent and serious natural and humanitarian disasters but also for the delays of the ships due to the extreme weather conditions. The fourth and final threat originates primarily from the geopolitical competition between the United States and China. This rivalry has resulted in the implementation of protectionist measures, such as the imposition of U.S. tariffs on Chinese goods, many of which were enacted during the Trump Administration. This could mean that with the recent U.S. elections results and the second Trump presidency, we may have to wait continuation and/or escalation of this policy measures. These measures constitute the reason why the volume of the transported products as well as their value between U.S. and China falls and automatically the volume and value of maritime trading via the Strait diminishes as well. The geographic location of the Malacca Strait clarifies that not only any further conflicts between Beijing and Washington but also any disputes in the South China Sea would afflict the trade conducted there.

The last chokepoint displayed on Figure 11 and hereby analyzed is the Panama Canal which was struck by climate change during the past year. As Dr. Arnab Chakrabarty explains in the Indian Council of World Affairs, since August of 2023, the Panama Canal with a length of 82 kilometers has experienced high congestion of vessels that fail to pass it because of the prolonged drought which has significantly reduced the water levels and by extension the El Niño phenomenon (2024). Actually, it is said that the traffic issue is so serious that it is about an unprecedented draught. As Geopolitical Futures write, water shortage of the Canal may sound not logical given that it crosses over 50 miles between two oceans. Nevertheless, it is attributed to the functioning of the Canal's lock system which depends on the freshwater supplied from the lakes Gatun and Alajuela. More specifically, the Canal's operational mechanism relies on a sophisticated system of locks and two distinct lanes, functioning akin to water elevators. This system facilitates the gradual elevation of vessels above sea level, enabling them to traverse the waterway. The typical transit time for vessels traversing the entire length of the canal ranges from approximately 8 to 10 hours.

The Panama Canal facilitates approximately six percent of global seaborne trade, encompassing maritime commerce with key economic partners such as the United States, Canada, Japan, China, South Korea, and various Latin American nations. Lower water levels in the Canal have significantly affected maritime operations. Larger vessels have been unable to transit, while smaller ones have faced extended waiting periods. To mitigate these challenges, authorities have restricted shipping traffic, resulting to delays. In some cases, cargo has been unloaded and transported overland to the other end of the Canal for onward shipment. To circumvent these disruptions, many ships have opted for the more hazardous route through the Southern tip of Latin America.

Droughts had led to disruption of the Canal's operations again in the past, in 2019-2020 and 2014-2016. The alarming part is that such occurrences have been more and more frequent. In this respect, authorities in Panama are seeking for options to ensure supplementary provision of water to keep the Panama Canal operational. Therefore, it is needed to be continually endeavored to find alternative solutions feasible to maintain the Canal functional in longtime. For instance, such a solution proposed

is damming of the Indio River which is located west of the Canal. In this way, a man-made reservoir will be made and its water will result to Lake Gatun increasing its volume.

Besides the kind of disruptions described above, there is also an impending geopolitical conflict between the U.S. and China. Taking official full control of the Canal in 1999, Panama received an economic support and the U.S. were satisfied with the Canal's policy consisted of impartiality, non-discriminatory toll methods and permission for entrance to all. The United States rely heavily on the operational efficiency of the Panama Canal for critical trade routes connecting the U.S. Gulf Coast and East Coast to Asia, facilitating trade between the U.S. and Latin America, and enabling efficient maritime transport between the U.S. and Europe. These trade routes are of paramount importance to the American economy, necessitating the uninterrupted operation of the Canal.

At the same time, China has tried to make its presence in Panama perceivable in order to be able to outplay U.S.'s presence there. That is why relevant investments in ports have been made on behalf of China, making the U.S. upset to keep its dominance over the area.

2.6 Conclusions

Chokepoints are the alpha and omega of the maritime transportation of energy. These and their prevailing circumstances determine the trading routes, their possible alternatives, the distances, the transit times and as a result the shipping costs. The geopolitical tensions accompanied by climate change may consist the major risks to international seaborne trade in decades. These elements jeopardize the reliability of critical shipping routes and threaten the smoothness of global supply chains. We saw three primary chokepoints -Panama Canal, Red Sea and Suez Canal- to face challenges in 2023 and 2024 simultaneously. Shifting trade patterns has been transformed from an emergency situation to the normal condition. The rerouting of vessels around the Cape of Good Hope has exacerbated congestion at South African and East African ports, as documented in the 2024 Review of Maritime Transport. When evaluating alternative ports for replenishment, shipping companies prioritize deep-water ports along the Cape Route. After each unpleasant occurrence or crisis, there are always lessons learnt apart from the repercussions. The lesson learnt in this case could be the fact that there is need for increasing capacity and efficiency promptly in order to improve the situation in the African ports where excessive congestion was observed.

After the above analysis, it is also revealed that besides the obvious conflicts with direct involved players, it seems that we have to also counter a backstage where indirect dangers loom. The fact that they are not spotlighted enough to draw the required attention and care makes them even more intense. Such danger can be regarded the backstage regarding the escalating civil Sudanese conflict, fueled by Russia and Iran, which can lead to further disruptions in global trade through the Suez Canal. Moreover, the pure geopolitical aspect of the Panama Canal draught, capable to exacerbate the U.S.-China relations, could be deemed another obscure hazard.

Last but not least, we realize that conflicts can be scattered over the globe; they can remain the same or change over the years. After all, we can be confident for one thing at least; the butterfly effect of the geopolitical conflicts (Angela Capolongo et al., 2024). She explains, and finds me in absolute agreement, that in today's globalized world, events on the other side of the globe, such as the seizure of a commercial ship, can have a direct impact on European economies. This is a prime example of the butterfly effect, where seemingly distant geopolitical tensions can have local consequences. As tensions rise in key regions, critical trade routes which include the Red Sea, the Strait of Hormuz, and the South China Sea are increasingly vulnerable. These routes are not mere geographical lines but vital "arteries" for global trade and energy flows.

Chapter 3: Study of Indicators

3.1 Introduction

Following the preceding theoretical examination of major maritime chokepoints and their susceptibility to geopolitical disruptions, this Chapter shifts focus to a more empirical approach. To validate the theoretical findings, the analysis will utilize quantitative data through the application of specific indices. The chosen indicators are the Geopolitical Risk Index and the Global Peace Index, enabling a data-driven assessment of the observed trends and their potential impact on maritime energy transportation. The indexes and their findings are described individually below.

3.2 The Geopolitical Risk Index

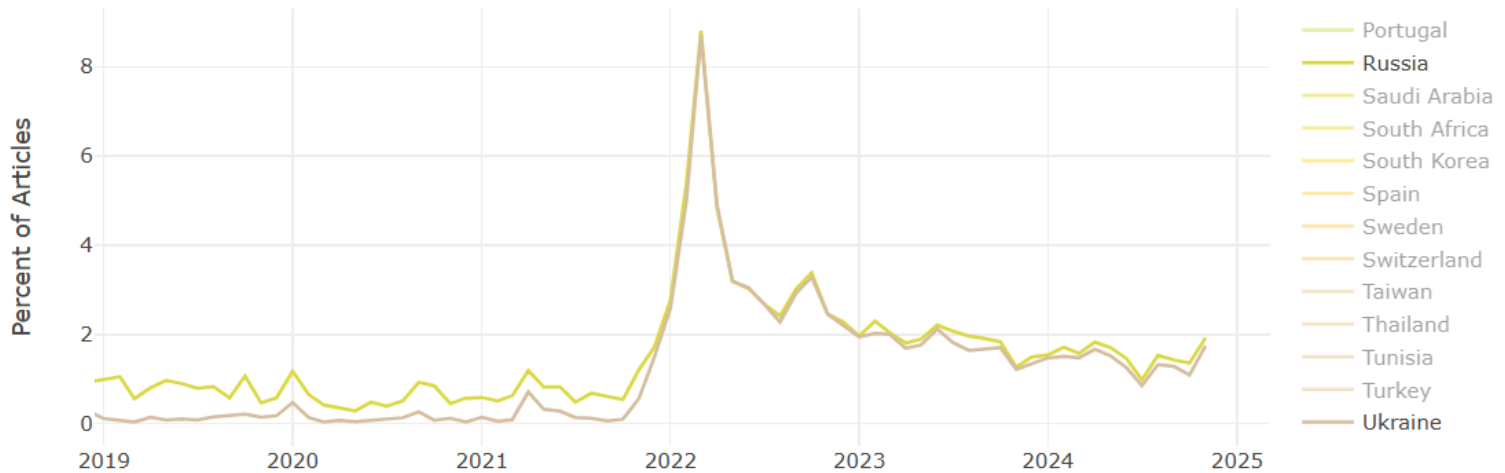
As far as the Geopolitical Risk Index (GPR) is concerned, it has been constructed by Dario Caldara and Matteo Iacoviello in order to measure the adverse geopolitical events and the corresponding risks based on the news. In other words, it is a text-based indicator; it measures the frequency of articles in leading newspapers mentioning adverse geopolitical events searching for specific words in the articles. Their study covers geopolitical tensions, their developments and their effects, since 1900.

Their search is facilitated through categorization of the articles. That is why the GPR is consisted of two sub-indexes, the Geopolitical Threats (GPRT) and the Geopolitical Acts (GPRA). The GPRT contains words which are part of the five categories: "Category 1: War Threats, Category 2: Peace Threats, Category 3: Military Buildups, Category 4: Nuclear Threats and Category 5: Terror Threats". On the other hand, the GPRA includes words belonging to the other three categories: "Category 6: Beginning of war, Category 7: Escalation of war and Category 8: Terror Acts".

For them, higher GPR can lead to: firstly, heightening perception of disastrous outcomes; secondly, making investments in risky projects less attractive; thirdly, decreasing consumer confidence. Also, higher value of GPR may signify a higher current prevalence of negative geopolitical events (such as increased frequency of armed conflicts), a greater likelihood of future negative events, and a heightened expectation of the severity of future adverse geopolitical occurrences.

The even more interesting and helpful part of this indicator project is that it also includes country-specific indexes constructed for forty-four different countries. It is worth observing indicatively the trajectory of the country-specific index for the respective countries of the maritime chokepoints whose disruptions were presented earlier in Figure 9 and elaborated. Focus is made on the specific date range of my thesis which is since end of 2019 until today. Having chosen the countries Russia and Ukraine on Figure 12, we can ascertain their very high geopolitical risk in March 2022 after the Russia's invasion of Ukraine in February 2022.

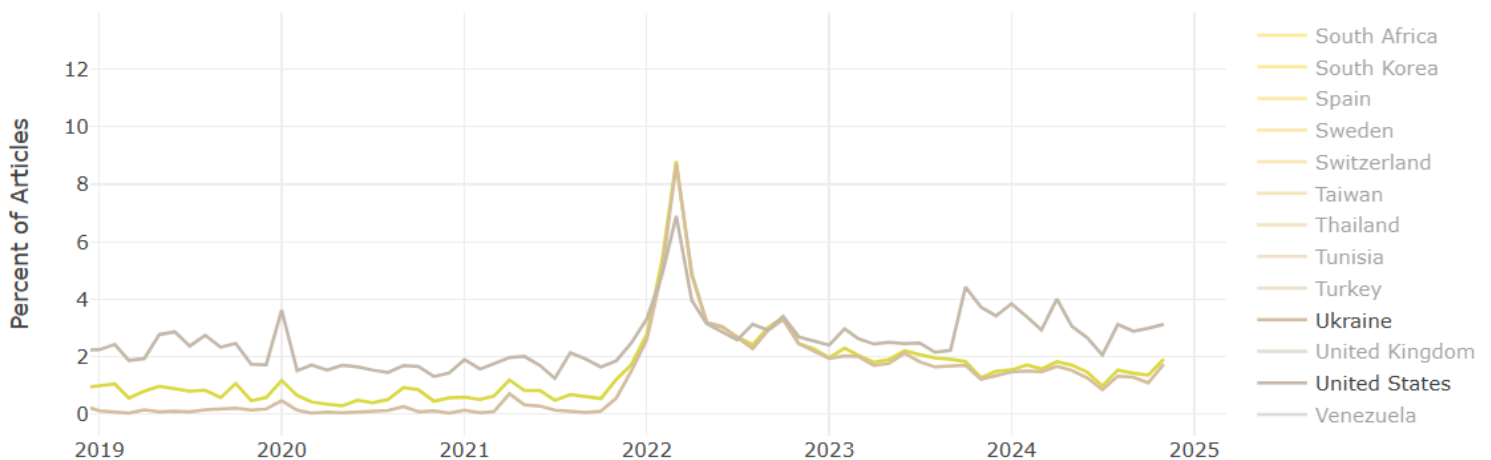
Figure 12. Country-Specific GPR Index - Russia & Ukraine



Source: Caldara, Dario and Matteo Iacoviello (2022), "Measuring Geopolitical Risk"

It is becoming more interesting when we add the United States and we output Figure 13. We realize the direct or implicit U.S. involvement to the war and their affection for sure. By the way, there is a related conspiracy theory available in the Council on Foreign Relations website, which wants the United States to finance biological weapons labs in Ukraine. This Russian conspiracy theory was repeated by Chinese government representatives back in March 2022. This happened when U.S. President Biden called the General Secretary of the Chinese Communist Party (CCP), Xi Jinping, and menaced repercussions if China supported Russia as it had been requested by the Russian President Vladimir Putin.

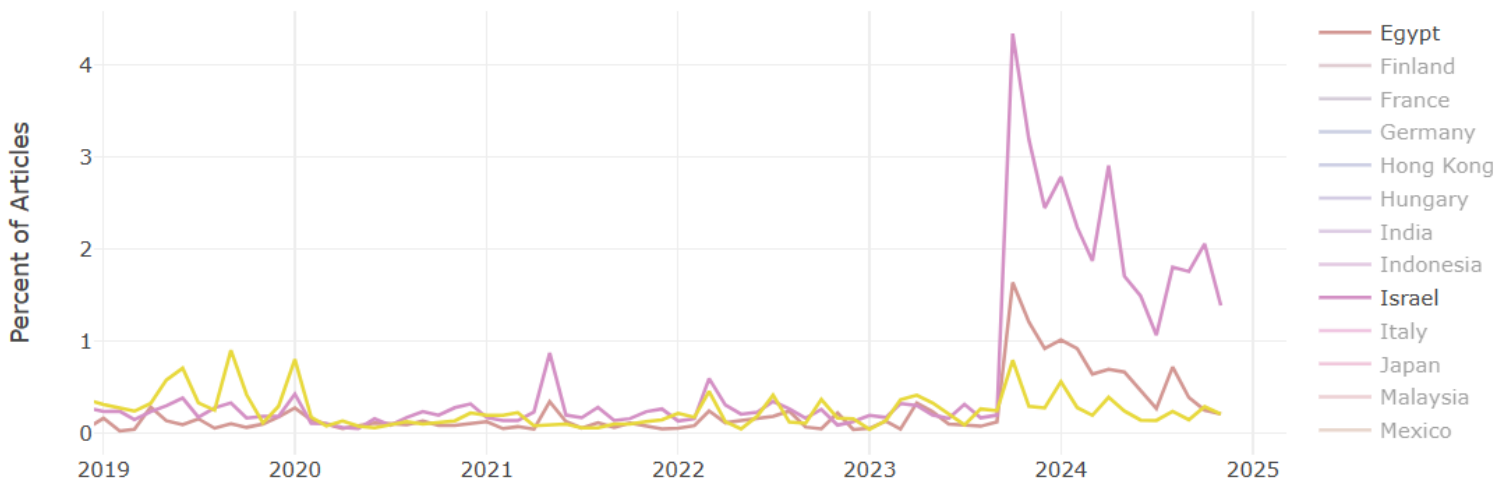
Figure 13. Country-Specific GPR Index - Russia, Ukraine & USA



Source: Caldara, Dario and Matteo Iacoviello (2022), "Measuring Geopolitical Risk"

To continue, Figure 14 below depicts the geopolitical risk indexes of the Middle East countries, Egypt's in orange line, Israel's in pink line and Saudi Arabia's in yellow line. It would be really useful to trace the geopolitical risk index of the other countries, such as Syria or Lebanon, as well, which are actually suffered from the Israel's war, if it was available. We suppose that their index would be even higher than those of the three aforementioned countries. The higher level of their indexes would obviously correspond to the Israel's invasion of the Gaza Strip in October 2023. We can also observe increased levels of the geopolitical risk indexes in May 2021, when Hamas-Israel confrontation occurred again, and in March 2022 when Israel-Palestine conflict prevailed again.

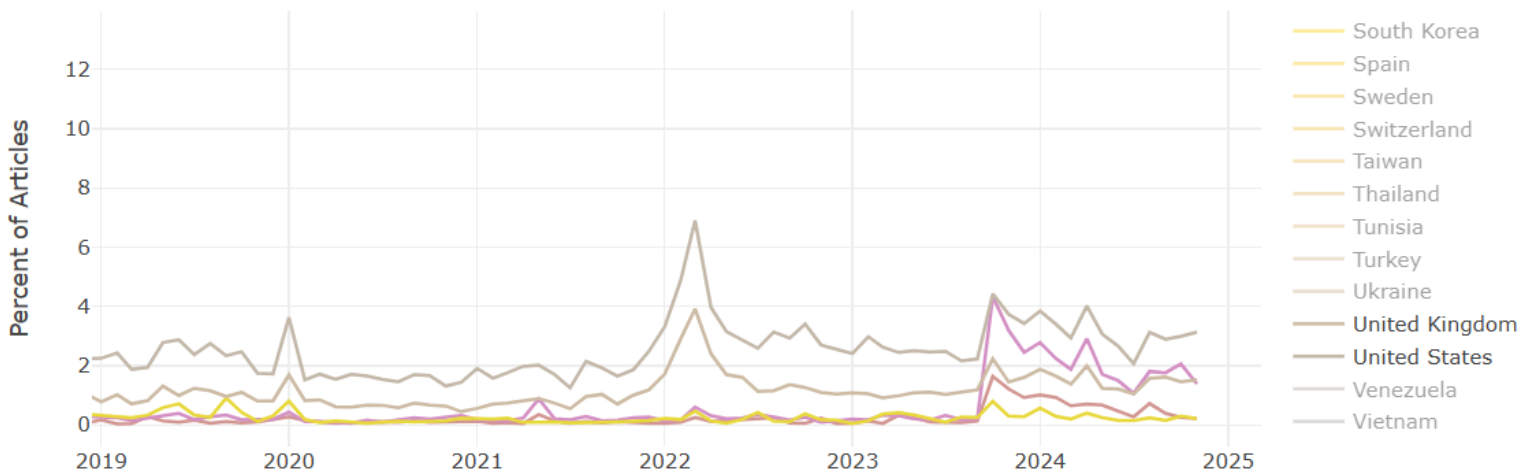
Figure 14. Country-Specific GPR Index - Egypt, Israel, Saudi Arabia



Source: Caldara, Dario and Matteo Iacoviello (2022), "Measuring Geopolitical Risk"

The complicity of United States and United Kingdom to the conflicts in Red Sea is reflected to Figure 15 after we have adjusted the Figure 14 and also added these two countries. This is exemplified by the joint naval and air strikes conducted by the United States and the United Kingdom against the Houthi militia in response to their sustained attacks on shipping (UK Parliament, July 2024).

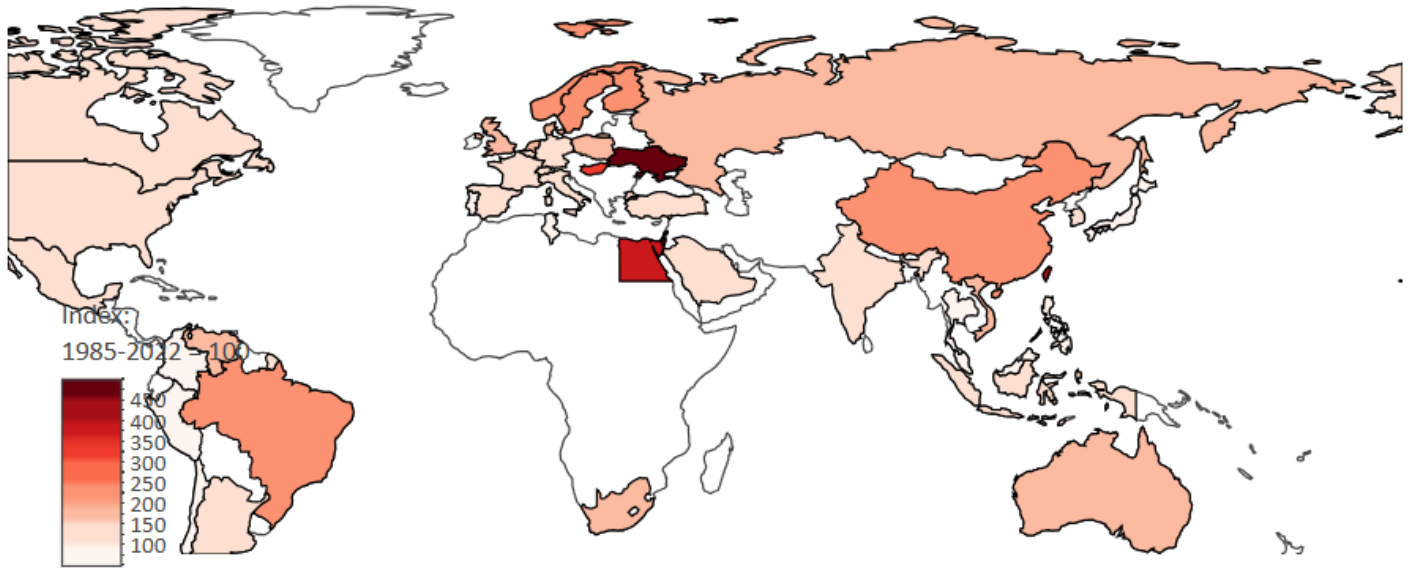
Figure 15. Country-Specific GPR Index - Egypt, Israel, Saudi Arabia, USA, UK



Source: Caldara, Dario and Matteo Iacoviello (2022), "Measuring Geopolitical Risk"

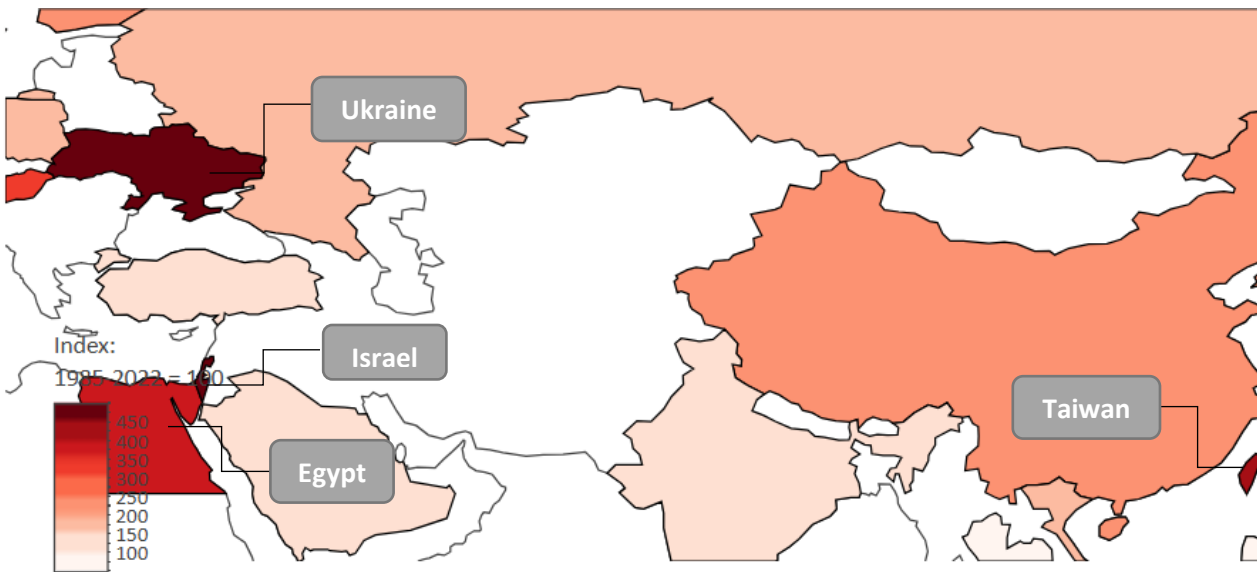
Last but not least, another interesting graph produced through this index is this one presented on Figure 16 - and Figure 17 with scaling up. The higher levels of Ukraine, Israel and Egypt have been already discussed and attributed to the Russo-Ukrainian war and the Israel-Hamas war respectively. When it comes to the high geopolitical risk index of Taiwan, it is attributed to the tense China-Taiwan relations widely known. As described in the Council on Foreign Relations, on the one hand, Taiwan, officially named the Republic of China (ROC), is an island nation situated across the Taiwan Strait from mainland China, governed by the People's Republic of China (PRC). Since 1949, Taiwan has maintained independent governance from the mainland (Lindsay Maizland, 2024). On the other hand, supporting the "one China" policy, the PRC considers Taiwan as a rebel region and promises the unification of it. Cross-strait tensions have escalated significantly since the 2016 election of President Tsai Ing-wen. President Tsai's deviation from the previous administration's approach to cross-strait relations has prompted increasingly assertive actions from Beijing, including frequent military exercises in the vicinity of Taiwan. A key concern among analysts is the potential for a Chinese military intervention in Taiwan to escalate into a broader regional conflict, potentially involving the United States. This concern stems from China's continued assertion of its right to reunify Taiwan, including the potential use of force, and the United States' stated willingness to defend Taiwan in the event of such an attack.

Figure 16. Geopolitical risk by Country (Dec 2023 - Present)



Source: Caldara, Dario and Matteo Iacoviello (2022), "Measuring Geopolitical Risk"

Figure 17. Geopolitical risk by Country (Dec 2023 - Present) (scaling up)



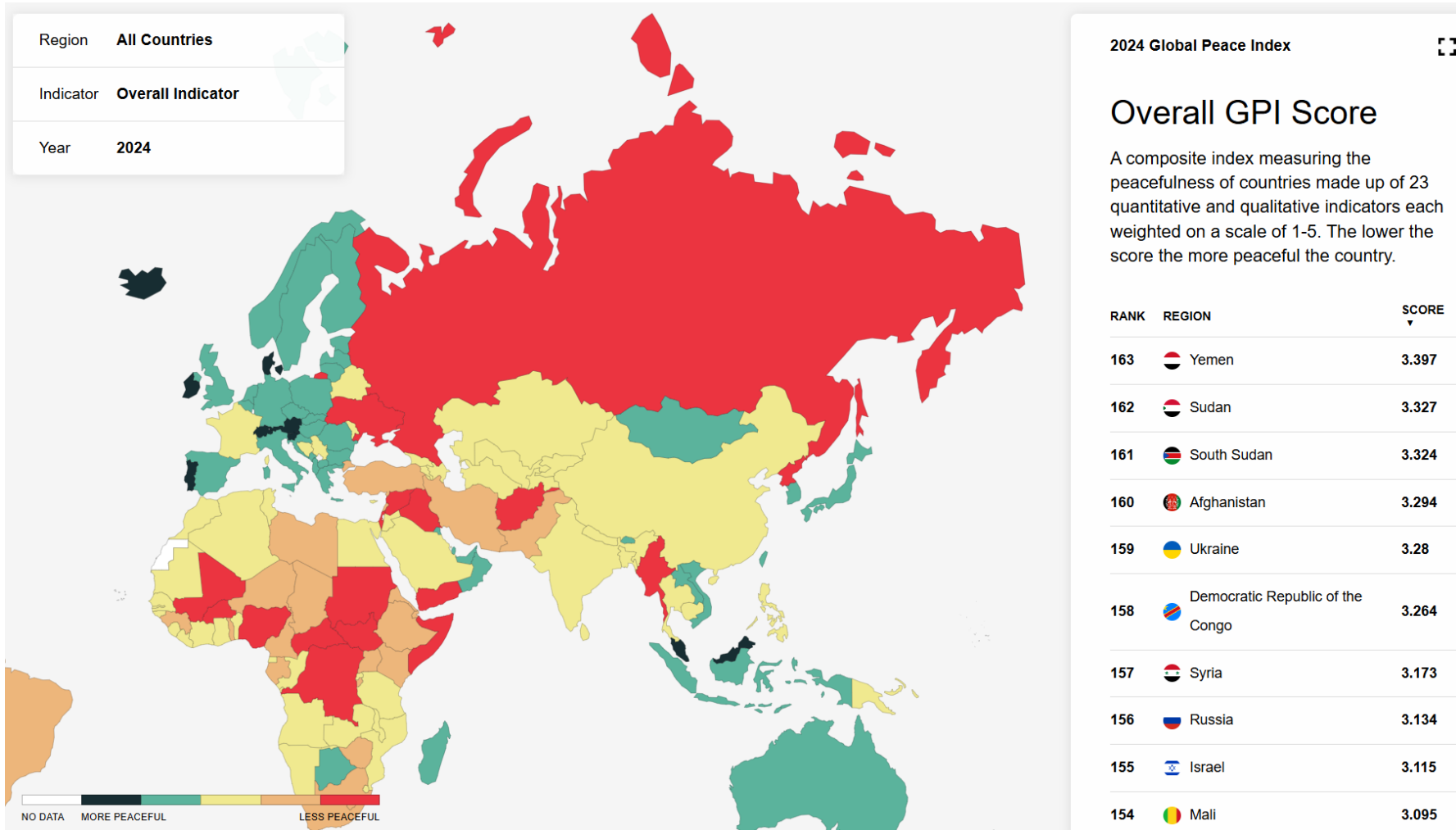
Source: Caldara, Dario and Matteo Iacoviello (2022), "Measuring Geopolitical Risk"

3.3 The Global Peace Index

The second indicator used in this Chapter is the Global Peace Index (GPI). It constitutes the foremost measure of global peacefulness while it is a product of the Institute for Economics and Peace (IEP). The Global Peace Index covers 99.7% of the world population; which means that it includes data of almost all the places of the globe. Some of their reliable sources are indicatively "Uppsala Conflict Data Program (UCDP) Battle-Related Deaths Dataset", "Non-State Conflict Dataset" and "Institute for Economics & Peace (IEP)". Twenty-three qualitative and quantitative indicators are used for its calculation and the level of peace is measured in regards with three separate domains: firstly, the degree of Societal Safety and Security, secondly, the range of Ongoing Domestic and International Conflict and thirdly, the extent of Militarization. The database which supports the calculation of this useful index is dynamic and interactive enabling the user to choose the filters which he/she is interested in. The available filters are pertaining to the region/country, the individual indicator and the year of interest. I intend to capture below the figures originated from the filters combination of my interest and elaborate on these in order for some results to come up. In general, from my point of view, it is worth asking for score ranking from the less peaceful country to the more peaceful one. As we will see in the captures below, the higher the score the less peaceful the country.

Seeking to see the overall Global Peace Indicator for all countries for the year of 2024, I have chosen the corresponding filters and the Figure 18 appears. All the countries that we were waiting to see on top are here. Mainly Houthis attacks in the Red Sea bring Yemen to the first position of the less peaceful countries with Sudan and Afghanistan to follow. The second position of Sudan may justify the stance of Paul Bartlett's article in the Economist that the escalating civil war in Sudan could lead to further disruptions in global trade through the Suez Canal, as previously analyzed. Moreover, we can also see Ukraine, Russia, Syria and Israel among the top ten countries; this is more than expected as they are the primary parties involved in the two ongoing wars.

Figure 18. 2024 Overall GPI Score

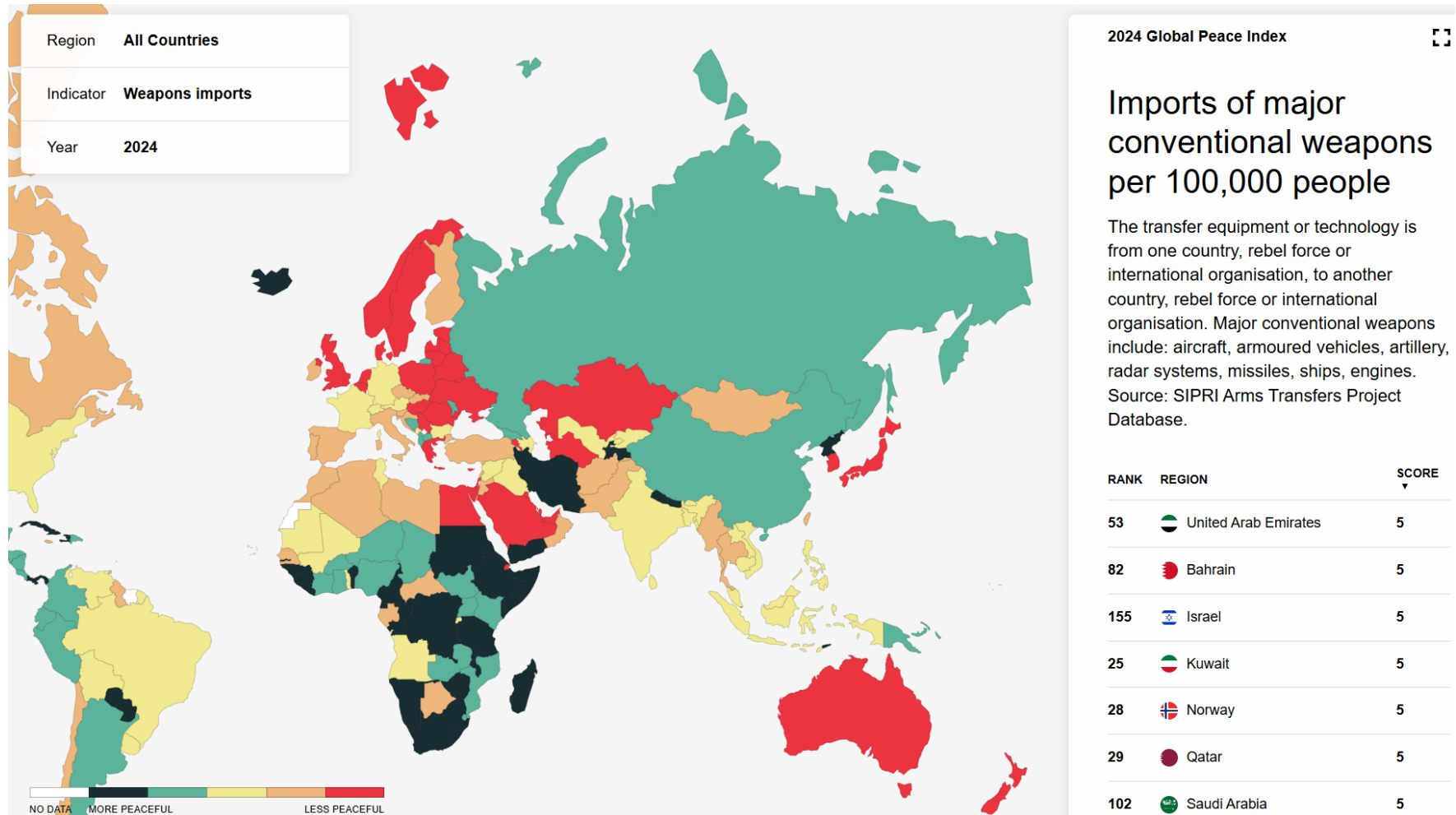


Source: Vision of humanity, 2024

Another interesting finding derived from the GPI study is the GPI score of the countries based on their imports of weapons during 2024. Figure 19 displays five of the Arab states/Persian Gulf states (UAE, Bahrain, Kuwait, Qatar, Saudi Arabia) to be among the counties with the highest percentage of weapons imports. This action is easily explained by the neighboring Israel-Hamas war which shows that the

conditions are volatile and the involvement of other states -let alone of the neighboring region- would not be surprising. Israel obviously needs military equipment.

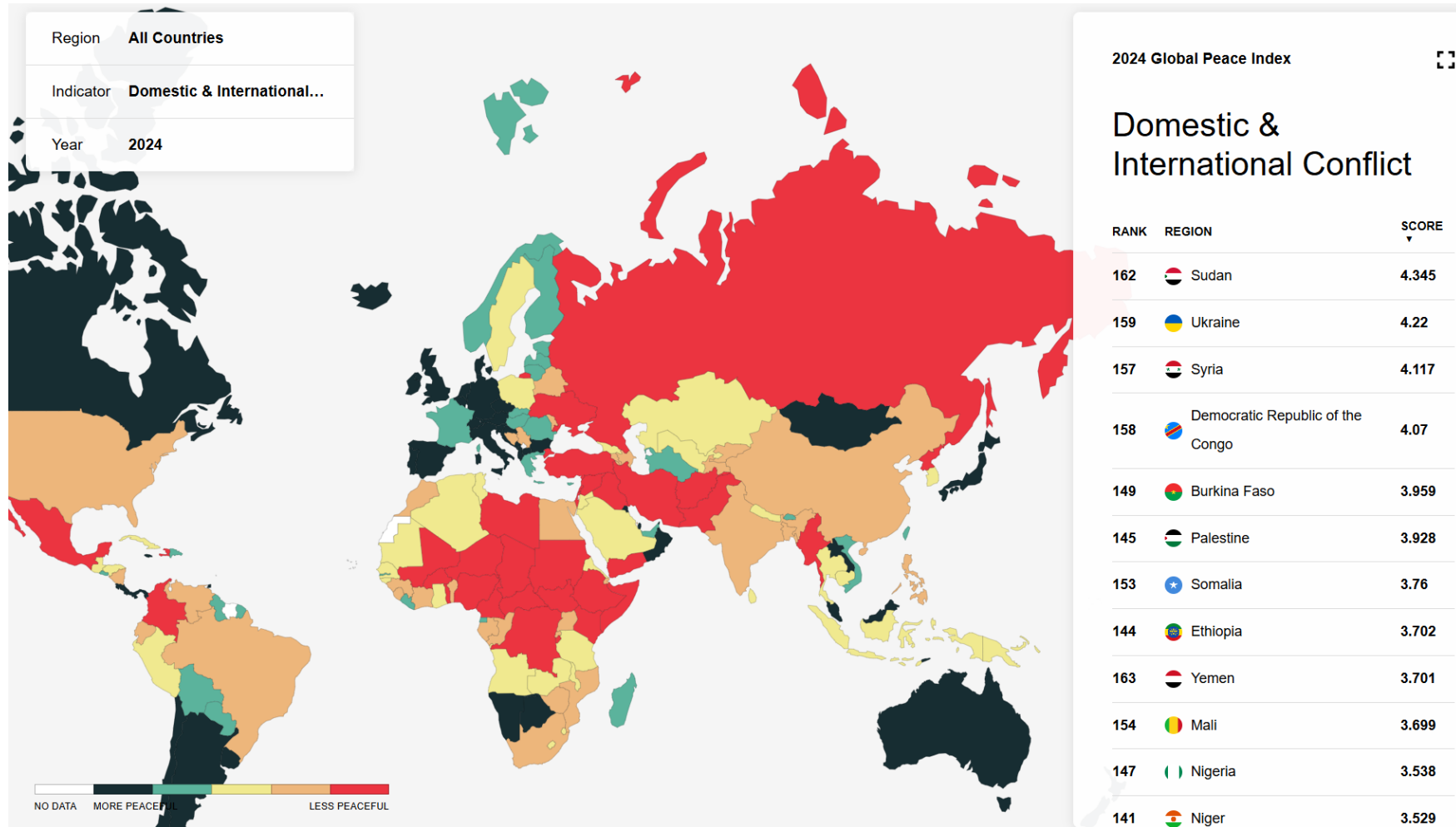
Figure 19. 2024 GPI Score based on weapons imports



Source: Vision of humanity, 2024

Figure 20 is the last GPI figure included in this thesis. It is one more capture which reflects the current intense situation of the domestic and international conflicts: the civil war in Sudan, the Russia-Ukraine war, the Israel-Hamas war and other very serious conflicts across the world which have not analyzed in this thesis as they do not constitute direct objects of study.

Figure 20. 2024 GPI Score based on Domestic & International Conflicts



Source: Vision of humanity, 2024

3.4 Conclusions

The preceded study of the two indicators, Geopolitical Risk Index and Global Peace Index, has contributed to the verification of the analysis made in the Chapter 2 which was based on the literature research. To sum up, according to the results from the GPI, it would be important to keep an eye on U.S.'s outlook regarding the Russia- Ukraine war as U.S. geopolitical risk remains high as per Figure 13. Anyway, we should not forget that U.S. and Russian Federation are competitors with regards to the oil/LNG production and exports. Moreover, another important point is spotted on the analysis of the Figures 16 & 17 that a potential Chinese attack on Taiwan could trigger a wider conflict involving the United States. The consequences of such an evolution would be highly severe for the global security of energy transportation and the maritime transportation generally. Furthermore, the GPI study over the weapons imports reveals the readiness of the Arab states to any extensive escalation of the existing conflict in the wider region of Red Sea. This means that the non-involvement of the neighboring states is suspended and this is far from revealing as another Persian Gulf war is absolutely denounced by all means. Finally, as mentioned again previously, the fact that Sudan is the number one, when we examine the domestic & international conflicts, empowers the concerns about further disruptions in global trade through the Suez Canal attributed to the intensification of the civil Sudanese war.

Chapter 4: Conclusions

To conclude, I wish to characterize the maritime energy transportation as “a single point of failure”; if it fails completely, the entire energy trading mechanism will stop. From my point of view, practically speaking, there is no doubt that none of the alternative means of energy transportation can replace the seaborne trade wholly. Besides, the fact that it is cost-effective and it attains economies of scale makes it the preferable and efficient way of transit.

Moreover, the leading role the maritime chokepoints play in the security of maritime energy transportation is clear. During the compilation of this thesis, disruptions due to geopolitical conflicts, climate change/environmental factors and unexpected incidents were met. Any disruption in even one chokepoint is able to change the conditions to the opposite side of the Earth and this is why the butterfly effect of the geopolitical conflicts was mentioned earlier. What I would like to highlight is that the utilization of alternative trading routes in cases of chokepoints blockage, either literal or metaphoric is not a simple solution. The forced breaking of the mold and passing through new paths generates new challenges soon or later. The higher operational costs -ending up to the consumers-, the delays attributed both to the longer distances and to new or supplementary institutional requirements, the disarray which prevails among the shipping operators, trader companies/charterers, crew members, authorities, insuring entities are emerging obstacles.

Upon the completion of this study, in my perspective, the initial desideratum, “if the energy transit by sea can remain secured at the end of the day and, if so, how it is attained”, is verified. No matter what, the energy transportation is conducted. A characteristic instance is the sanctions imposed against Russian Federation due to the invasion of Ukraine. Some sanctions were imposed indeed; but it is widely known that their effect was unintended. Therefore, the truth is that, somehow, the energy will be exported from wherever it is meant to be and it will be imported to wherever it is meant to be. This might be the fundamental. Another fact is that the surroundings is dynamic as the developments are constant. What is useful is to observe them in order to realize the global scenery and speculate and act suitably. Apart from the regrettable side of the disruptions, they also give the opportunity to decipher the international backstage. They reveal the official or unofficial allies and supporters of the states and thus, they may reshape the energy flows – direction of energy imports and exports.

Finally, this thesis also endeavored to demonstrate concerns and future considerations. For example, from an environmental aspect, the Panama Canal draught brings concerns related to the frequency and severity to light; the need for finding alternatives is strengthening. Insisting on the geopolitical aspect, the upcoming second Trump presidency might constitute a matter for our attention regarding the U.S.-China and U.S.-Iran relations further to the aforementioned analysis. Also, matters overlooked by global media, such as the Sudanese civil war, are to be attended as the danger to affect the global scope around the energy transportation is looming. Last but not least, could the regime collapse of the former leader Bashar al-Assad of Syria and his fleeing to Russia influence and entangle the global maritime energy transportation in any way?

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