

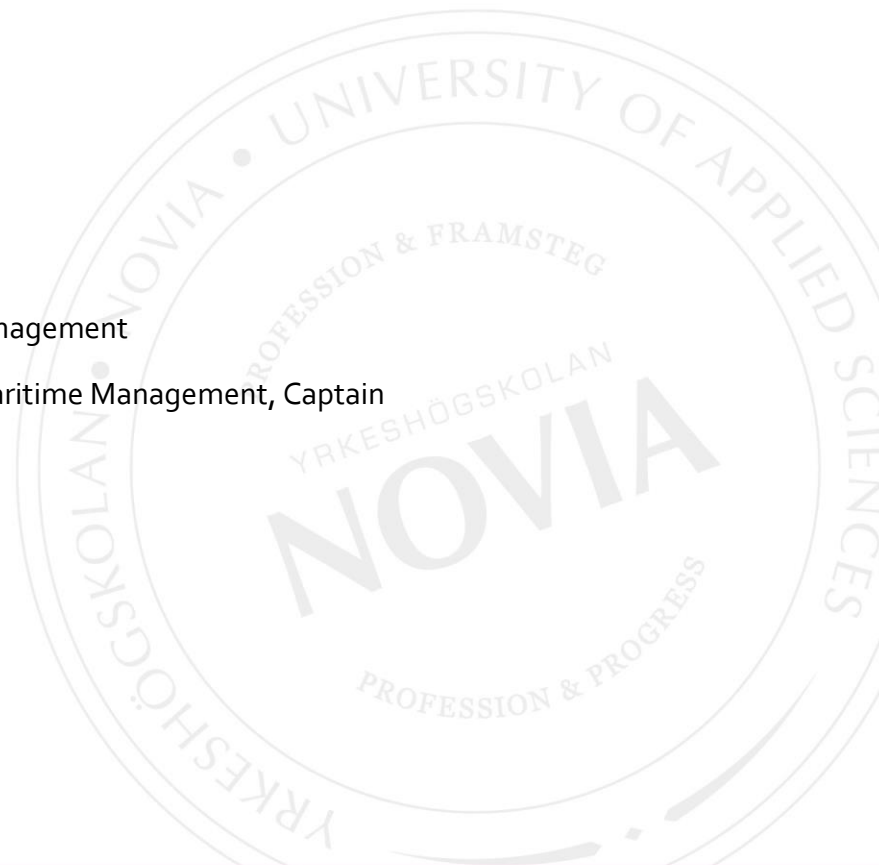
Arctic Passage – A Feasible Sea Route?

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Abstract

The aim of my thesis was to investigate the prospective use of the Northern Sea Route and which countries have the greatest interest in the area and why.

In writing this thesis, I used only literary publications, thus conducting a qualitative study.

In my present work, I concluded that shipping via the NSR will certainly become safer, faster and cheaper in the future, but with the current capacity, awareness and technological level and cost of the countries, the NSR is not an option in the near future. I did my research before the conflict in Ukraine, and this will have a further negative impact on the development of the region. Postponing its use to an even more distant future.

Language: English Key words: Northern Sea, ice melting, future shipping routes

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INTRODUCTION

The Arctic has become an increasingly important region for the world in recent years. There are both threats and opportunities. The Arctic is experiencing major global impacts from climate change and growing geopolitical tensions, while at the same time offering new economic opportunities.

Climate warming is first and foremost a global challenge, but it will also create new opportunities for economic activity in the Arctic, particularly in resource extraction and transport.

More than half of international trade covers distances of more than 3000 km, which means that more than one mode of transport is used to get it from the point of origin to the next destination. (8) International transport is therefore made up of transport chains. These chains are designed in such a way as to make optimum use of the distribution centers for the organization of international transport.

Today, the largest flows of goods are by sea to Asia and Europe. The Suez Canal has been an important link in maritime trade between Europe, Asia, and Africa for many years. This route is economically much more advantageous than the other alternative sea route from Europe to Asia around the Cape of Good Hope on the southern tip of the African continent.

However, over the years, there have been several disruptions in the movement of ships through the Suez Canal, which have seriously disrupted the transport of goods. Since 1975, shipping traffic has been stopped on the Suez Canal on three occasions: in 2004, a tanker was blocked in the canal and traffic was stopped for three days, and in October 2017, a container ship was blocked for a few hours. In March 2021, one of the world's largest container ships, the 400-metre-long MV *Ever Given*, with a gross tonnage of 220,940 tons, was blocked in the canal for almost a week on its way from China to Rotterdam. This stoppage caused huge economic damage to shipping companies and ports, but also to consignees.

The Suez Canal is not the only place on the waterways where there is a risk of major congestion. There are many other such places - the Straits of Malacca and Hormuz, the

Panama Canal, the Danish Straits in Europe, the Bosphorus, and the Dardanelles. These places are also known as choke points. These are places where, if something happens, the consequences can be very painful.

It is precisely the crises and the fast-growing economies that have forced many countries and shipping companies to look for new alternative routes to Europe and Asia. When choosing new routes, shippers are primarily based on the possible length of the waterway - a shorter route means a ship can reach its destination more quickly, which in economic terms also means lower operating costs (crew and fuel costs). In addition, canals in the transport route are an additional cost, when canal waiting times, canal fees and the potential size of the vessels must be considered.

The development of the Arctic region and the Northern Sea Route (NSR) has recently been on the agenda of the world's leading countries. Many economic and shipping experts from different countries, as well as politicians, believe that the Arctic region has a future for the development of global maritime logistics and trade. The President of the Estonian Academy of Sciences, Tarmo Soomere, has also expressed his opinion on this issue - "One of the consequences of the Suez Canal traffic congestion is that alternatives to the current cargo supply routes will be sought. The sea route from Japan to Scandinavia via the Northern Sea Route is about half the length of the route around the entire Eurasian continent, then through the Mediterranean and out to the North Sea. It's natural that eyes will turn to alternatives." (1) At the same time, however, concerns are also expressed that the diplomatic and natural constraints that exist today in the NSR may negatively affect the competitiveness of this trade route with other viable routes.

Melting Arctic ice opens the prospect of shorter shipping times, and this increases the attractiveness for freight transport significantly. Compared to the transport of goods from China to Europe via the Suez Canal, the Arctic Ocean would be 5,200-6,800 km shorter, and the time would be 10-13 days less. (9) More optimistic estimates suggest that the shipping route could become navigable year-round, but this would require the use of powerful nuclear icebreakers under current conditions, which is not realistic before 2030. The navigation period will depend on the rate of melting of the Arctic ice, which may be faster than previously predicted.

The aim of my work is to analyse the prospective use of one possible alternative to the Suez Canal - the NSR.

The Northwest Passage (NWP) could also be an alternative transport route between Europe and Asia, as well as between the West and East coasts of the United States. However, in comparing the NWP and NSR routes, I have concluded that the NSR clearly has the greater near-term prospect. The EU's major trading partners in Asia, China, Japan, and South Korea (9), have also shown a particular interest in the development of the NSR.

In this work, I will analyse the possible development of the NSR in the future. During the analysis, I will try to find answers to the following questions in particular:

- What are the primary interests of the Asian countries dominating world trade in the Arctic, and how might these interests affect the rapid development of the NSR?
- What could be the positive and negative aspects of NSR development?

1 THE IMPORTANCE OF MARITIME TRANSPORT IN WORLD TRADE

1.1 CHANGES IN THE WORLD ECONOMY

Only must look at developments in the world economy since the beginning of this century to see where the centre of gravity of the global economy has shifted to.

Three world economic poles have now emerged: the European Union, Northeast, East and Southeast Asia and North America.

Based on long-term forecasts by economic experts, the clear shift in the centre of gravity of the world economy towards Asia is set to continue. Asia has emerged as the fastest-growing economic region.

Of particular note is China's economy, which has been a major driver of global economic growth in recent years. Importantly, China has consciously reduced its dependence on exports and increased the contribution of its domestic economy to growth. Technological interdependence between China and the rest of the world has increased. These changes in economic policy have reduced China's investment, reduced import volumes, and negatively affected the economic growth of countries dependent on Chinese imports. The existence of a large and increasingly prosperous domestic market has made China's economic development less dependent on foreign trade, while other Asian countries remain heavily dependent on Chinese investment and trade. China has now emerged as an economic powerhouse whose economic performance has a direct impact on the global economic outlook.

Real GDP growth projections for 2021 and 2022:

	2021	2022
China	8,5%	5,8%
India	6,7%	9,9%
USA	6,0%	3,9%
World	5,7%	4,6%
Korea	4,0%	2,9%
Indonesia	3,7%	4,9%
Japan	2,5%	2,1%

Source: OECD Economic Outlook Intern Report September 2021

China's share of global GDP is no longer growing at the same pace as in the past, but various economic experts predict that the Chinese economy will soon account for 25% of the world economy. India, on the other hand, will also grow rapidly, to 15%. So, the combined share of the two countries - China and India - in the world economy will be 40 %.

This year's Eurostat report shows that China has become the EU's main trading partner, overtaking the US for the first time. Trade between the EU and China in 2020 was €586 billion, between the EU and the US €555 billion. EU exports to China increased by 2.2% to €202.1 billion, while imports from China increased by 5.6% to €383.5 billion (2).

In addition to these two countries, faster growth is expected in other Asian countries such as Indonesia, Japan, South Korea, Malaysia, the Philippines, and others. There is reason to believe that this will also make a significant difference to trade flows towards Asia.

India's long-term growth prospects are very good, thanks to its young population, low dependency ratio, healthy savings and investment, and growing integration into the global economy. (3).

While the economies of all Asian countries may not all develop at the same rapid pace in the future, the geographic concentration of the world's population's purchasing power will be quite different from today, which will of course have an impact on the flow of goods across the world's seas.

When describing future trends in maritime freight transport, it is important to start with where future supply and demand for goods will be concentrated, which in turn will be influenced by national developments and relations between countries.

The rapid development of foreign trade and the growth in trade flows have also had a major impact on shipping and shipbuilding.

It should certainly be noted that long-term trends in economic development, for example, do not exclude short-term crises and setbacks. The crisis triggered by the COVID-19 pandemic is currently shaking up the world's economies. Only time will tell whether this will lead to disruptive changes in trade between countries with long-term effects.

1.2 MARITIME TRANSPORT, THE MODE OF TRANSPORT WITH THE HIGHEST TRANSPORT VOLUME

The international transport of goods is part of the production value chain, so where the goods are located, where the demand is and at what price and quality the goods can be transported are important market drivers.

International trade in goods is growing steadily, as is the demand for international freight transport. Maritime transport is one transport option, competing with air transport and, on land, rail, and road transport. The choice between transport options is made based on the relationship between availability, price, and quality (including speed) of transport. As the transport of goods is only one part of the chain from supplier to buyer, infrastructure (terminals, vehicles, etc.) and the functioning of logistics and distribution systems are important in addition to transport.

The development of maritime transport over the last half century has been driven by two major trends - the increase in the size and speed of ships. Over the same period, ships have increased their capacity to carry cargo more than tenfold and their speed of navigation has doubled.

Today, maritime transport has become the mode of transport with the highest volumes of international transport. More than 90% of all goods transported worldwide are carried by sea. Goods that are large in volume and not time-sensitive are ideally shipped by sea.

At the beginning of 2020, the world's merchant fleet consisted of 98,140 ships with a total carrying capacity of 2.06 billion tonnes (4), all carrying goods on the world's oceans.

One of the biggest advantages of maritime transport is its low cost. Also, for many products, maritime transport remains the only technically feasible mode of transport and the most economically viable option due to the large volume of goods transported. Most types of goods can be transported by sea and maritime transport is also considered to be the most environmentally friendly mode of transport (6,7).

The advantages of maritime transport compared to other modes of transport are:

- very large volumes of goods carried
- relatively low transport tariffs
- the most economical mode of transport
- good regularity on short routes
- high loading efficiency

The increasing cargo carrying capacity of cargo vessels has significantly reduced the costs of maritime transport. Compared to other modes of transport, maritime transport has the lowest freight rates. The higher the world price of motor fuels rises, the greater the competitive advantage maritime transport will have over other modes of transport.

The development of maritime transport, the introduction of large vessels, has also been hampered in recent decades. Ports and navies have proved to be limiting factors in the

development of maritime transport. Very large vessels require deep berths, ports with deep-water berths and large cargo handling capacities at port terminals.

One of the drawbacks of maritime transport is the long delivery time. Also, in most cases, additional transport (road or rail) is needed to deliver the goods. Another disadvantage is that specific ports only deal with specific categories of goods and therefore the ports closest to the destination may not always be suitable. In exceptional cases, there may be a very high risk of environmental pollution, and, in rare cases, a very large amount of goods may be at risk, lost or damaged at the same time. At sea, there may also be a risk of piracy, which may entail longer routing or additional costs for ship protection and insurance (6,7).

In summary, the disadvantages of maritime transport are:

- low frequencies over long distances and long intervals between transport charts.
- stringent requirements for packing and securing goods.
- relatively low average speed, long transit times.
- low flexibility
- high port charges
- dependence on weather conditions

2 NATIONAL INTERESTS IN THE ARCTIC

Clearly, the interest of the world's leading countries in the Arctic region has increased. Ten years ago, the Arctic was considered a peaceful region. The upheaval has been gradual, brought about by global warming and the increasing impact of human activities in the region.

Territorially, the Arctic is shared by eight countries: the United States, Iceland, Canada, Norway, Sweden, Finland, Denmark (via Greenland) and Russia. All these countries have cooperated in the past, but recent events, notably the melting of the icecap, have changed both the way they have behaved and the forms of cooperation. Melting ice allows easier access to natural resources and allows the opening of new shipping routes.

At present, there is a lack of common understanding of what Arctic resources can be exploited, under what conditions and who has the right to do so.

National interests in the Arctic have developed in three main areas: (25)

- expanding knowledge on climate change
- ensuring access to Arctic transport routes that reduce the cost of delivering goods during the navigation period
- cooperation between countries in the extraction of natural resources, including fisheries in the Arctic seas

Particularly noticeable are the two major countries: Russia and China are increasingly interested and active in the Arctic region (10).

Actively opposing the monopolistic interests of Russia and China are Japan, Norway, and Germany, who consider it expedient to set up an international administration for the operation of the NSR, which would deal with all issues related to the use of the NSR (25).

2.1 LEGAL REGULATION OF DELIVERY IN THE ARCTIC

In the Arctic, state action is governed by the United Nations Convention on the Law of the Sea (UNCLOS). (17) This international convention provides a legal framework for the settlement of international disputes relating to the oceans, and regulates the law of the sea, the limits of sovereignty, shipping and regulations on marine mining and pollution. The convention also defines two important boundaries: the territorial sea, which is 12 nautical miles, and the exclusive economic zone, which gives a state the right to control resources both at sea and on the seabed for 200 nautical miles.

In addition to the international law of the sea, various organisations regulate activities in the Arctic.

The Arctic Council is the main institution governing activities in the Arctic. It is not an international organization with a fixed constitution, it is freer and is intended more as a forum to foster cooperation. (18) The Arctic Council is composed of representatives from Canada, Denmark, Finland, Iceland, Norway, Russia, Sweden, the US, and local tribal peoples. The Arctic Council is primarily concerned with environmental and climate issues.

The International Maritime Organisation (IMO) is tasked with ensuring the safety of shipping and the prevention of marine pollution. (19)

2.2 RUSSIA HAS THE GREATEST ARCTIC CAPACITY

Russia is a major power in the Arctic and a strong influence on the processes in the region. The Arctic is an important part of Russia's identity as a state, but Russia also has problems managing the vast and unpopulated Far North.

The Arctic is a strategically important region for Russia: accounting for about 18% of the total area of Russia it generates 11% of its national income, accounts for 22% of Russian exports, and produces about 80% of its natural gas and 60% of its oil reserves. The development of the Arctic is impossible without adequate infrastructure especially the transport one. Russian authorities attach importance to the NSR, because land and air transport routes in the Arctic Zone of Russia are underdeveloped. (28)

Russia has so far not had the opportunity to build and rely on a coalition of its supporters to defend its interests in the Arctic, while all the other Arctic states are politically and economically aligned, either within NATO or the EU.

Russia's intentions in the Arctic are not clear. On the one hand, Russia has a strong economic interest in the Arctic, linked to oil and gas production and the use of the NSR. On the other hand, military interests. (12)

The NSR is the backbone of Russia's Arctic transport infrastructure, without which the extraction of its natural resources, the supply of its northern territories and the

development of the country's northern territories and the northern part of the country would be impossible.

The use of the NSR as a link between the Pacific and the Atlantic Ocean will have a positive impact on the Russian economy, as the intensive use of this sea route will create the conditions for the development of transport and infrastructure along the entire coastline, the creation of an icebreaker fleet and a fleet of tankers and dry-cargo vessels with high ice protection. The economic situation of the shipping companies operating on the NSR waterway will also be significantly improved.

Russia has high hopes for trade with China via the Northern Route. China, for its part, sees the NSR as part of its One Belt, One Road project (13).

2.3 CHINA'S ARCTIC INTERESTS

Now that the Chinese economy is doing well and industrial production is growing fast, it is crucial that Chinese goods reach the European market faster and cheaper. This is one of the reasons why China has shown a particular interest in the Arctic in recent years.

Today, China is an observer in the Arctic Council and describes itself as a region close to the Arctic. China's interests and objectives are very much linked to its identity and its desire to be accepted as a partner in the region.

The main reason for China's strong interest in the Arctic is certainly economic. It is China's interest in the region's abundant natural resources. With its rapid industrial growth, the country has been dependent on imports of energy resources, which today come from the unstable Middle East. China is therefore interested in new markets for energy sources.

Although China is formally cooperating with Russia on the development of the NSRF, this is a declaratory action on the part of China, based on political and strategic considerations, rather than an expression of concrete economic interest.

China's NSR policy is based on the thesis that Russia does not have, and cannot have, a monopoly on this route, since according to the norms of international law Russia cannot block the movement of ships even through its territorial waters. (25)

The special status of the NSR as a special transit zone for ships is interpreted by China only as Russia's right to impose a ship insurance regime, to provide paid services for carrying out rescue operations, and to provide icebreaker services as well as meteorological and other information.

China's growing ambition to strengthen its influence in the Arctic region is clearly visible. China highlights its economic interests on the grounds that today 80% of China's merchandise exports and 60% of its oil import from middle east pass through the South China Sea, and that if there is any obstacle to free navigation, the Chinese economy will not be able to withstand it. (6) China also highlights transit, shipbuilding, research, and natural resources as its interests in the Arctic but neglects geopolitical and security considerations. the NSR could be an important strategic starting point for China in particular, as it would help to alleviate the over-reliance on the Straits of Malacca and the Suez Canal, which, in the event of a US and US allied naval blockade in these locations, the NSR could prove to be a necessary alternative, along with land rail links. (14)

China's interests in the development of the Northern Sea Route are: (15)

- A desire to strengthen its influence in the North Pacific, as far as the Bering Strait. *China is clearly aware that the importance of this region will grow with the development of Arctic shipping.*
- Benefits from cooperation with Russia and other Arctic states. *China does not have direct rights to the resources.*
- China's economic plans. Establishment of research stations in the Arctic, development of new technologies for Arctic resources, construction of new icebreakers, etc.).
- The Chinese government understands that the economic development of Arctic resources is linked to maintaining a stable and secure environment.

Minister for the Development of the Russian Far East and Arctic - Aleksey Chekunkov (6) predicts that a shorter route from the Chinese port city of Shanghai to Rotterdam via the Northern Sea Route will be possible by 2030 (6).

However, it should be borne in mind that the Arctic countries are increasingly fearful that China may use its trade and scientific capabilities to leverage its political and military ambitions (16).

2.4 JAPAN AIMS FOR SUSTAINABLE DEVELOPMENT IN THE ARCTIC

Japan has been an observer state of the Arctic Council since 2013. Japan sees Arctic policy as an opportunity to apply its scientific and technological achievements. It also hopes to benefit from the NSR transport corridor and the wider exploitation of the region's natural resources.

With Japan's help, Russia has become technologically self-sufficient in processing liquefied natural gas in the Arctic. Japan is interested in developing the NSR in cooperation with Russia.

Japan, together with other East and Southeast Asian countries, is an important alternative partner for Russia in the development of the Arctic and helps avoid over-dependence on China. (26)

2.5 SOUTH KOREAN INTERESTS

Following its accession to the Arctic Council in 2013, South Korea published its Arctic Strategy and Master Plan for the region. These documents are intended to serve as the NSR and natural resource development strategies. In the Master Plan, South Korea identified four goals (25):

- promote international cooperation
- manage scientific research

- developing the Arctic for further development of the Arctic ecosystem
- create the necessary infrastructure

The NSR's new transport and logistics route is of great interest to South Korea. During the operation of the NSR, the distance between Busan and Rotterdam would be reduced by 32% (from 22 thousand to 15 thousand kilometres): the NSR is becoming the most attractive project for South Korea from an economic point of view (25).

To make the NSR route more attractive compared to the Suez Canal route, South Korean experts consider it important to pay more attention to reducing transport time and costs.

2.6 US INTERESTS IN THE ARCTIC

US interests in the Arctic have greatly increased in recent years. Prior to 2018, the US paid relatively little attention to the Arctic, but this has now changed as it is concerned about Russian and Chinese activities in the region. This is most clearly reflected in the Pentagon's 2019 Arctic Strategy, which identifies Russia and China as strategic rivals. (17) Russia and China are now more concerned about US activities in the Arctic than any other two countries.

3 ALTERNATIVE ARCTIC SEA ROUTES TO THE SUEZ CANAL

For centuries, European maritime countries have been looking for a direct route from Europe to Asia. While the search for sea routes from the southern latitudes yielded results, the search for sea routes from the north remained fruitless for a long time. These searches took a long time, and even today, the Arctic's northern sea routes are not yet open to all traffic. Until now, the movement of ships has been affected primarily by difficult climatic conditions, but also by legal and political uncertainty. However, there is more optimism for the future, as the opening of new Arctic routes is seen as offering great potential for faster and more cost-effective transport of goods. The advantages of trans-Arctic Sea routes include in particular:

- shorter voyage times will reduce the labour costs of the crew
- lower fuel consumption
- no vessel mileage tax (icebreaker fee paid)
- no queues
- no risk of pirate attacks
- no limits on the size of vessels

Rapid technological progress and climate change are also providing increasing opportunities to open new sea routes to Asia-Europe in the Arctic. There has been more talk of two shipping routes, largely within the sphere of influence of two countries, Russia, and Canada. However, the US and China are reluctant to accept such a situation. The maritime routes in dispute between the major powers are those out of the Atlantic - the Northern Sea Route (NSR) and the Northwest Passage (NWP). These two sea routes, if fully opened, would save shipping companies many thousands of miles and much time, would be more cost-effective, and would have a major impact on existing maritime trade.

3.1 NORTHERN SEA ROUTE (NSR)

The NSR runs through the Arctic Ocean (Barents, Kara, Laptev, East Siberian, and Chukchi Seas) to the Pacific Ocean. This sea route from Murmansk to the Bering Strait is about 2600 nautical miles long. (22) This sea route would reduce the shipping distance between Rotterdam and Yokohama by more than 40% compared to the current one (via the Suez Canal).(23) The estimated time to cross the NSR is 7-15 days at a potential ship speed of 5-13 knots.(27) The NSR would be a long and cost-effective route, especially for North-East Asia and Northern Europe.

The NSR route is in the Arctic Ocean, which is characterised by very harsh climatic conditions that make navigation difficult. The average winter temperature is -33 degrees Celsius. During the warmer months, the temperature rises to +7 degrees. Icebergs and ice fields also make it difficult for ships to navigate. During the warm season, when the open

water navigation period is 2-4 months, vessels can navigate without icebreakers, but during the winter season icebreakers are needed (21).

While the western part of the NSR is kept ice-free by the North Atlantic Current, the eastern part may not be free of ice caps every year. The navigation period has been short. Ice cover is the main obstacle to vessel movement. However, modern icebreakers now allow year-round navigation.

Laurence Smith, professor of geography at the University of California, Los Angeles, hopes that both the NSR and the NWP, north of Russia, will be passable by conventional small ships with small icebreakers in 2050. (20)

The shorter distance of the shipping lane offers advantages such as fuel savings, reduced crew maintenance costs, no canal charges and, as a result, a reduction in freight.

In addition to saving time, ice-free passage in the Arctic would also help avoid dangerous pirate attacks and reduce the high taxes associated with transiting the channels. However, it should certainly be borne in mind that excessive optimism is undermined when the potential risks may outweigh the benefits. Even if the melting of the Arctic ice accelerates, there may still be variations from year to year, which means that transit routes may be open one year and closed the next. Uncertainty as to whether and when a transit route will be open increases the risks as goods do not reach their destination on time, leading to large losses. (22)

The volume of goods transported via the NSR in 2019 was 31.5 million tonnes, but Russia is already planning to transport 80 million tonnes by 2024 and 160 million tonnes by 2035. (27) However, the Covid-19 pandemic in the world today is also expected to reduce transport volumes.

The transformation of the Northern Sea Route into a global route will depend on a warming climate that will allow longer navigation in Arctic waters. At the same time, the reduction of ice cover in the Arctic may lead to the traditional routes of the NSR, which currently pass through the inland sea, the territorial sea and Russia's exclusive economic zone (EEZ), moving up in latitude. In this case, part of the shipping routes will remain outside the limits of Russia's sovereign rights and jurisdiction, which will then no longer have the legal authority to control ships sailing the Northern Sea Route. The NSR route

from the category of a national transport corridor under Russian control may become an international shipping route. The need for mandatory Russian provision of icebreakers and pilotage will diminish and navigation will be ensured by the International Maritime Organisation and international conventions governing these operations. However, such a scenario is still unlikely, as climate change is said to be cyclical (27).

3.2 NORTHWEST PASSAGE (NWP)

The NWP passes through the Canadian Arctic islands and allows for a variety of different routes. The southernmost of these follows the Peel Sound Seaway, which has been open in recent years and has a mostly annual ice cover. This route also has some drawbacks - it is not the most direct, it passes through narrow channels and is too shallow in places, restricting larger vessels. The more northerly route through McClure's Strait from Baffin Bay to northern Alaska to the Beaufort Sea is much more direct and therefore more attractive for large ocean-going vessels, but it is also more frequently frozen. The NWP is potentially more adaptable to trade between Northeast Asia and North America but may be less commercially viable than the NSR (22).

The NWP would shorten the sea route from San Francisco to Rotterdam by nearly 25% compared to a sea route through the Panama Canal. (23) The NSR will be ice-free earlier than the NWP, according to scientists. (24)

When sailing NWP, be aware that the weather conditions in the area are very harsh. In open waters, storms can be very severe and unpredictable and can disable the vessel. The Arctic Ocean environment is very fragile and vulnerable, and pollution and discharges are difficult to clean up. It is essential that professional crews are prepared to operate vessels in the harsh conditions in this region. It is essential to invest heavily in infrastructure to ensure successful navigation. The availability of an ice class, which not all ships have, is certainly an essential condition for passage for all ships. To remain competitive, shipping companies will have to invest in the procurement of new ice-class vessels. New icebreakers need to be built as a matter of urgency to replace existing obsolete vessels and to meet today's high standards. Insurance companies do not yet have experience in

this area and are therefore reluctant to take on all the risks, so insurance will also be a very expensive and complex process.

Currently, the NWP is only available for most summer courses. If global warming continues, the possibility of Arctic shipping for at least several months of the year should not be ruled out. Climate warming could make the NWP north of Canada an economically viable route. Perhaps at some time in the future, when this harsh region is well explored, the NWP will become a real competitor, but not at the present time (20).

4 PROBLEMS HAMPERING THE RAPID DEVELOPMENT OF THE NSR

Contrary to many optimistic expectations for the future, the following factors make it difficult for ships to navigate in Arctic conditions today:

- Severe ice conditions. Ice can form rapidly in very different places, catching crews unawares and reducing the predictability of vessel movements. In addition, melting ice in the Arctic is associated with the formation of icebergs and the risk of collision with them may increase.
- Navigation in extreme climatic conditions and during polar nights. Technically challenging as it requires ice-class vessels, including icebreakers.
- Numerous administrative and technical difficulties. Including the costs associated with the need to pay for the service of using icebreakers, as well as the work of Russian pilots in steering the vessels through the straits.
- An underdeveloped rescue system with limited coverage. Infrastructure not fully developed. Limited number of deep-water harbours for vessels in need of repair. High risk of collisions due to unpredictable ice conditions and poorly marked fairways...
- Very high insurance costs. Because international insurance companies must consider NSR's anticipation of freight conditions.

In conclusion, however, all these shortcomings do not prevent Russia from developing ambitious plans for the development of the Northern Sea Route, nor do they diminish the interest of foreign companies, especially from Northeast Asian countries, in this important Arctic route.

Icebreakers are essential to keep the Arctic shipping lane ice-free and operational. However, different Arctic countries have very different capabilities to do this. Although there is no real alternative to icebreakers, shipping in the Arctic can be made safer by building specially reinforced hulls. Such ice-penetrating vessels are more expensive to build and to procure, and they burn much more fuel than those that operate in warm waters. Because of their short navigation time, the payback period is also very long.

Navigation in the NSR is more difficult because in these conditions ships cannot sail at a constant speed, so fuel consumption will still be high, contrary to the view that the route is much shorter and should use less fuel. A major difficulty is the difficult weather conditions - fog, ice conditions that vary from year to year, very low temperatures, strong and unpredictable storms - which threaten the security of supply of goods.

Costs will be significantly boosted by more expensive insurance (50-200% according to various sources).

The fact that this is a very sensitive natural environment, which is highly vulnerable to the risk of pollution from shipping, could also be a problem.

Across Russia's Arctic Ocean, there are major concerns about outdated and obsolete port infrastructure, which requires huge investment to upgrade.

Other potential problems include territorial disputes between countries in the Arctic region, and the fact that the shipping route would predominantly pass through the Russian exclusive economic zone, giving Russia control over environmental requirements, tariffs, and services. However, should conflicts between the major powers over the extraction of mineral resources in the Arctic arise, this too is likely to lead to obstacles to shipping.

In view of all these problems, it has been estimated that the use of the NSR for container transport, for example, could only become economically viable from 2040 onwards. (9) It

is also possible that in the future, the Arctic shipping routes will find a niche for the transport of certain goods that are sufficiently time sensitive.

4.1 NSR COMPETITIVE ADVANTAGES

Most importantly, the NSR route allows goods to be transported 1.5 times faster than the traditional route through the now congested Suez Canal (25).

It is well known that the melting of the Arctic icecap will significantly reduce transport costs, as travel times from Europe to Japan and China will be reduced by 20-40%. Such faster connections can be offered for freight between Asian ports north of Hong Kong and Europe via the Arctic. Japan, South Korea, and China are therefore keen to benefit from the opening the NSR.

Instability in the Middle East, congestion in the Suez Canal, growing tensions in the Strait of Hormuz and other conditions unfavourable to peaceful shipping are also accelerating developments in the NSR.

An analysis of external expert evaluations suggests that the following measures should be taken to improve the competitiveness of the NSR (25):

- simplifying the procedures for authorising ships to transit the NSR route and making the decision-making process transparent and understandable for carriers.
- to develop uniform tariffs for all carriers for the provision of services along the length of the NSR.
- to develop conditions that would attract the world's largest carriers to operate on the NSR route.
- to coordinate the activities of all ports on the NSR route.
- to develop coastal infrastructure along the entire NSR route.

Overall, even with high fuel prices, the NSR route becomes profitable for Chinese, Japanese and South Korean traders, even with the overheads and inconveniences. (25)

5 ANALYSES

The topic of my thesis is the Arctic passage - Northern Sea Route (NSR) as an alternative to the Suez Canal on the European Asia route.

If we analyse developments in the global economy since the beginning of the 21st century, in chapter 1.1 I say that centre of gravity of global economic development has increasingly shifted to Asia. Various economic experts predict that China's share of the world economy will rise to 25% in the coming years. India, on the other hand, will increase its share from the current one-tenth to more than 15%, bringing the combined share of China and India to 40% of the world economy. In addition to the two big countries, other Asian economies such as Japan, South Korea, Indonesia, and the Philippines are also growing steadily.

As the industrial production grows, especially in the Asian region due to cheap labour, it is important that international trade grows with it, as does the demand for international freight transport. The choice between transport options will be made based on availability and price. Maritime transport is one of the transport options, competing with air transport and, on land, rail, and road transport. However, as the transport of goods is only one part of the journey from supplier to buyer, not only transport but also infrastructure (terminals, vehicles, etc.) and logistics and distribution systems are important.

Today, maritime transport has become the mode of transport with the highest volumes of international traffic. More than 90% of all goods transported worldwide are carried by sea. Goods that are large in volume and not time-sensitive are best transported by sea. Compared to other modes of transport, maritime transport has the lowest freight rates. The more the world market for motor fuels increases, the greater the competitive advantage of maritime transport over other modes of transport will be.

It is remarkable that China has become the EU's largest trading partner, overtaking the US in 2020. Now that the Chinese economy is doing well and industrial production is growing fast, it is crucial that Chinese goods reach the European market faster and cheaper. Therefore, China is now actively seeking new and safer shipping routes to Europe.

Today's global crises and fast-growing economies have also forced other countries and shipping companies to look for new alternative routes to Asia-Europe. In their search for new routes, shippers are primarily looking at the possible length of the waterway - shorter distances mean ships can reach their destination faster, which in economic terms also means lower operating costs.

China sees the development of the NSR as a promising option for the future, and in this respect, it has taken the lead in its development. China's growing ambition to strengthen its influence in the Arctic region is clearly visible. China is highlighting its economic interests on the grounds that today 80% of China's merchandise exports and 60% of its oil import from middle east pass through the South China Sea, and that if there is any obstacle to free navigation, the Chinese economy will not be able to withstand it.⁽⁶⁾ The NSR could be an important strategic base for China in particular, as it would help to alleviate the over-reliance on the Straits of Malacca and the Suez Canal, which, in the event of a naval blockade by the US and its allies at these points, the NSR could prove to be a necessary alternative, together with land rail links. (14)

The EU's other major Asian trading partners, Japan, and South Korea have also shown interest in NSR development.

China's NSR policy is based on the thesis that Russia does not and cannot have a monopoly on this route, since under the norms of international law Russia cannot obstruct the passage of ships through its territorial waters. (25) This thesis was written before the war that we are facing now in 2022 year between Russia and Ukraine. At this stage it is very difficult or even impossible to predict what is going to happen in the future with the development of NSR. The economy has changed with the sanctions and relationships between nations with it.

The special status of the NSR as a special transit zone for ships is interpreted by China only as Russia's right to establish a ship insurance regime, to provide paid services for conducting rescue operations, and to provide icebreaker services as well as meteorological and other information.

The NSR runs through the Arctic Ocean (Barents, Kara, East Siberian and Tchuktchi Seas) to the Pacific Ocean. (22) This sea route would, for example, reduce shipping distances

between Rotterdam and Yokohama by more than 40% compared to the current situation (via the Suez Canal) (23).

The shorter distance of the fairway offers advantages such as fuel savings, reduced crew maintenance costs, no canal charges and, as a result, reduced freight costs.

In addition to saving time, a transit option through the Arctic would also help avoid dangerous pirate attacks and reduce the high taxes associated with transiting the channels. However, excessive optimism should certainly be tempered by the fact that the potential risks may outweigh the benefits. Even if the melting of the Arctic ice accelerates, there may still be variations from year to year, meaning that the passages may be open one year and closed the next. Uncertainty as to whether and when a transit route will be open increases the risks, as goods may not reach their destination in time, leading to large losses (22).

Judging from my background material the following factors can be considered negative for the development of the NSR:

- Complex ice conditions, where the ice cover can build up rapidly, as well as the risk of icebergs forming and colliding with ice when the ice melts; The presence of icebreakers is essential to keep the navigation channel free of ice and to use it. Although there is no real alternative to icebreakers, navigation can be made safer by the construction of specially reinforced hulls. However, such vessels are expensive and burn much more fuel.
- Navigation is more complex. As ships cannot sail at a constant speed in these conditions, fuel consumption is high, contrary to the view that the route is much shorter and should consume less fuel.
- Numerous administrative and technical difficulties. Including the costs associated with the need to pay for the service of using icebreakers, as well as the work of Russian pilots in steering the vessels through the straits.
- Russia's outdated and obsolete port infrastructure along the Arctic Ocean. An underdeveloped rescue system with limited coverage. Infrastructure not fully developed. Limited number of deep-water harbours for vessels in need of repair.

High risk of collisions due to unpredictable ice conditions and poorly marked fairways.

- Very high insurance costs. Because international insurance companies must consider NSR's anticipation of freight conditions.

The transformation of the NSR into a global route will depend on a warming climate, which would allow longer navigation in Arctic waters. At the same time, however, a reduction in the Arctic ice cover could lead to the traditional routes of the NSR, which currently pass-through inland seas, territorial seas and the Russian EEZ, moving upwards in latitude. In this case, part of the shipping routes will remain outside the limits of Russia's sovereign rights and jurisdiction, which will then no longer have the legal authority to control the NSR's moving vessels. The NSR route from the category of a national transport corridor under Russian control may become an international shipping route. The need for compulsory provision of icebreakers and pilotage by Russia will diminish and navigation will be ensured by the International Maritime Organisation and international conventions governing these activities. However, such a scenario is still unlikely, given the cyclical nature of climate change (27).

The transformation of the NSR into today's major international maritime route will depend on the speed with which all stakeholders are able to develop the necessary infrastructure to serve the entire route and to contribute to innovative developments in shipping.

My research questions were about positive and negative aspects of NSR development and primary interests of the Asian countries dominating world trade in the Arctic and how might these interests affect the rapid development of the NSR? I believe I have answered it in my research, but this could be further studied.

6 METHODS AND PROCEDURES

Choosing the topic for my thesis was one of the most difficult parts of the process. I started working on it basically in the first year of school and I was only able to come up with something in the last year of school when one of the biggest logistical crises in shipping in recent times occurred with the disruption of shipping traffic on the Suez Canal linking Europe to Asia and East Africa. Causing a disruption of about a week in shipping traffic. In this context, I became interested in looking further into alternatives to the Suez Canal.

According to the Estonian newspaper "Eesti Ekspress" (30.03.2021), the Suez Canal carries ten billion dollars' worth of goods every day, which is one eighth of the world's trade and more than one million barrels of oil. On the same day, the newspaper "Postimees" published a report in which one of the Estonian scientists said that alternatives to the current freight routes would soon be sought (1).

Of course, when I started to search the internet, I found a lot of information about different canals, locks and other narrow waterways all over the world. The most important of these are the Strait of Malacca, which connects the northeast Indian Ocean with the South China Sea at Sumatra Island, and the Panama Canal, which crosses the American continent. The Panama Canal caught the eye the most, as it was recently widened, and news stories were written everywhere. In this context, I also found a thesis written by an Estonian looking at the impact of alternative transport routes on the Panama Canal. At the same time, I started looking for an alternative to the Suez Canal. However, this topic did not look for an answer to any question that I should research, it was just alternatives to the Suez Canal, which was too easy, and I was forced to rework my topic a bit.

Important keywords in my search on the web were Panama Canal, Suez Canal, Arctic passage, ice melting, future shipping routes, China interest in the arctic, Eurostat, choke points etc.

As the Northern Sea Route (NSR) runs through Russia's exclusive economic zone, Russian vessels have so far operated more on this sea route. Russia has carried out a lot of research in the Arctic region and published many scientific publications, which I used as

source material for this work. For this work, I also drew a lot of help from reports of Arctic research by US scientists through the press.

It is the crises and the rapidly growing economies of Asian countries that have forced countries and shipping companies to look for new alternative routes between Asia and Europe. When choosing new routes, carriers are primarily concerned with the length and safety of the waterway. A shorter route means that ships can reach their destination more quickly, which in economic terms also means lower operating costs (crew and fuel costs). Additional costs are also incurred for the canals in the transport route, when canal waiting times and canal dues based on the size of the vessels must be considered.

In the autumn of 2021, a documentary "China's interests in the Arctic" (30.) was broadcast on Estonian television and watching it I became interested in the region as an alternative to the Suez Canal. China is very interested in the Arctic, so I wanted to know if there were other countries interested in the region. And what are the problems that hinder the development of this region. After all, in terms of the length of the route, it would be a strong competitor to the Suez Canal, and on this basis that I decided to use this alternative in my work.

While putting together my thesis, I thought it was important not to describe too many alternatives other than the Northern Sea route, such as the Panama Canal, the Northwest Passage, etc. Initially, when I started to write my paper, I thought it was important to explore more alternatives, but when I analysed the tutorial on how to write a thesis using only literary sources (an article on the internet "Literature review as research methodology"). I then found it important not to stray too far from the topic and mention extraneous things. I found most of the material I used on the internet by searching for keyword-matched articles. When you search in this way, it is easy to find yourself on a page you had no idea existed. For example, several Russian-language publications. Similarly, a lot of information about books was obtained by referring to a book somewhere in an article and getting interested and physically owning it. So, for the most part, I found my sources on the internet, although it would have been possible to do all of this in the library, relying only on hard copies. It would certainly have been much more time-consuming then. I'm confident in the credibility of my sources, as they all come from official sources, rather than Wikipedia, where anyone can edit the information.

To find information to answer my questions about which countries have an interest in the Arctic, I quickly learned that the biggest interest is of course Russia, which is the country with the most territorial ties to the region. The other big interests are the Asian countries, which would significantly reduce the distance between Asia and Europe. Looking at the economic data from various sources, the Asian economy is growing rather due to manufacturing and the associated demand for transport. Based on this data, I limited myself to looking for the interests of different countries, that the Asian region is the most important to note in my work (China, Japan, South Korea).

China is the world's largest exporter of manufactured goods and services. In 2020, China will replace the US as the EU's main trading partner. Several other important EU trading partners are also located in Asia - Japan, South Korea, India, etc. (2).

7 CRITICAL EXAMINATION AND DISCUSSION

I was satisfied with the result of my research. Before I started writing it, I knew nothing about the locks associated with the Panama Canal and I knew virtually nothing about the Arctic as a potential future sea route region.

In this context, I became much smarter factually about why Asian countries have interests there. That China's exports to Europe surpassed even the US in 2020 etc.

What I could have done differently is that I didn't immediately read the rules on how to write literature-based research and in this context, I read a lot of irrelevant information, for example the history of the different channels. Information not necessary for my work, but good knowledge for myself.

Of course, the countries' interests in the region are not just transport-related either. The region is also rich in natural resources, which are of interest to different countries. Again, new information for me.

My conclusions on the future use of the NSR are based on the growing interest of North-East Asian countries (China, Japan, and South Korea) in trade with the EU.

I enjoyed researching this topic, there was a lot of material, and it was not very difficult to find out the result. It was time-consuming to process the material. If somebody else were to research the answers to the same questions, I think the result would be the same. Of course, one can always go more specific, for example by studying the given route using only container transport as an example. I, however, simply looked at it as an alternative to the Suez Canal.

A comparative analysis of the key parameters of the Suez Canal and the NSR could have been added as an important feature of the present work.

8 CONCLUSION

The melting of the Arctic icecap will in the future significantly reduce transport costs for freight via the NSR, as travel times from Western Europe to Japan or China will be reduced by 20-40%. The Arctic link will be of particular interest to Asian and European ports north of Hong Kong. Hence the greater interest of Asian countries: Japan, Korea, and China in the benefits of opening the NSR.

Clearly, the opening of the NSR and the NWP will make shipping in the Arctic faster and cheaper in the future, but at current levels of capacity, awareness, technology, and cost, they are not yet an alternative to today's sea routes.

The fact is that, in comparison between the NWP and the NSR routes, ice conditions have been much more difficult for the NWP. In the western part of this route (Beaufort Sea), which is open to the Central Arctic Basin, perennial ice has often blocked certain sections of the shipping lanes, thus not guaranteeing safe passage of vessels within a single navigation period.

The Northern Sea Route will only be able to compete with the Southern Freight Routes if it is economically viable and its infrastructure ensures maximum reduction of additional risks when sailing in the Arctic.

“It is generally accepted that the NSR begins at the Kara Gates, but sometimes the capital of the Russian Arctic Murmansk is taken as the starting point and the entire route is divided into two sections: the Western and the Eastern ones.

Russia`s Ministry for the Development of the Far East and Arctic has recently proposed almost doubling the boundaries of the NSR water area, from Murmansk to Sakhalin.” (29)

The transformation of the NSR into a major international maritime route will depend on the speed with which all stakeholders are able to develop the necessary infrastructure to serve the entire route and to contribute to innovative developments in shipping.

It is necessary to create all the conditions for the year-round operation of the NSR waterway. It is essential to pay greater attention to the desire of the Arctic states to establish a unified regional search and rescue service and to prevent man-made disasters. This is of the utmost importance for the ecology of the region, especially for the protection of vulnerable wildlife at sea and in adjacent areas.

Other potential problems to be considered include international territorial disputes in the Arctic region, and the fact that the shipping route will be predominantly within the Russian exclusive economic zone, thus giving Russia control over environmental requirements, tariffs, and services. Should a conflict arise between the major powers over the extraction of mineral resources in the Arctic, this could also create obstacles to shipping.

Special vessels are needed to keep new sea routes free of ice and to keep them navigable. While there is no real alternative to icebreakers, safer navigation in the Arctic can be achieved by building specially reinforced hulls. Such ice-penetrating vessels are more expensive to build and procure and burn much more fuel than the vessels currently used for long-distance transport in warmer latitudes. Add to this the dangerous weather conditions, the difficult-to-navigate conditions in the broken ice and the lack of maritime traffic management skills, and there are still doubts about the safety and cost-effectiveness of exploiting Antarctic Sea routes in today's conditions.

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