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Northern Sea Route - Communication for the 21st Century?

Bachelor's Thesis

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Declaration

1. I hereby declare that I have compiled this thesis using the listed literature and resources only.
2. I hereby declare that my thesis has not been used to gain any other academic title.
3. I fully agree to my work being used for study and scientific purposes.

In Prague on July 30th, 2020

Jan Kregl

References

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Abstract

The Northern Sea Route (NSR) is a naval communication between Europe and Asia running along the Arctic coastline of the Russian Federation. For decades, the same maritime corridors have been relied on. However, the international freight shipping volumes keep growing steadily and the Suez and Panama Canals might reach their maximal capacity soon. In order to prevent congestions of these crucial chokepoints, alternative communications have to be found. The NSR can save as much as 40% distance compared to the Suez Route and consequently, the time spent on the voyage decreases by about 10 days. There are several other benefits this Arctic seaway brings, however, some major obstacles impede its further development. In this work, I summarized the history of the Route and analyzed some of its key aspects. The current maritime transport situation and some alternative communications are outlined, too. The main advantages and disadvantages of the Northern Sea Route are presented in order to find out whether this unique naval corridor can serve as a communication for the 21st century and what its future prospects look like. Finally, the following research questions are answered: How do the US-Russian territorial disputes and the Russian domestic legislation affect the NSR? What would be the economical implications of increasing the NSR traffic volume? What are the major obstacles and barriers hindering the possible NSR development?

Abstrakt

Severní mořská cesta je námořní komunikace spojující Evropu s Asií podél arktických břehů Ruské federace. Po dlouhá desetiletí jsou v námořní dopravě využívány tytéž komunikace, celkový objem přepravy však stále roste a Suezský či Panamský kanál by tak brzy mohly dosáhnout svých maximálních kapacit. Aby bylo možné předejít přehlcení a paralyzaci těchto klíčových strategických bodů, bude zapotřebí hledat nové, alternativní komunikace, které alespoň částečně uleví těmto přetíženým trasám. Severní mořská cesta může být až o čtyřicet procent kratší v porovnání se Suezskou trasou a nabízí tak značnou časovou úsporu. Vedle toho přináší tato komunikace mnoho dalších výhod, pojí se s ní však i četná negativa a její další rozvoj naráží na mnohé překážky. V této práci jsem nejprve shrnul historický vývoj, kterým trasa prošla a následně jsem se snažil analyzovat a rozebrat rozličné aspekty této námořní cesty. Nastíněna je také současná situace v námořní dopravě a další alternativní komunikace. S těmi je pak Severní mořská cesta porovnána a jsou akcentovány její klady i zápory. Rozvedena je rovněž i úvaha o tom,

zda-li může tato námořní trasa představovat komunikaci pro 21. století a jaký je její nejpravděpodobnější budoucí vývoj. V závěru jsou pak rovněž zodpovězeny následující výzkumné otázky: Jak ovlivňují mezinárodněprávní územní spory a ruská vnitrostátní legislativa tuto trasu? Jaké by byly ekonomické dopady, pokud by se intenzita provozu na této komunikaci v budoucnosti zvýšila? Jaké jsou hlavní překážky, které brání dalšímu potenciálnímu využití a rozvoji Severní mořské cesty?

Keywords

Northern Sea Route

Arctic

Arctic Ocean

Russia

Geopolitics

Maritime transport

Klíčová slova

Severní mořská cesta

Arktida

Severní ledový ocean

Rusko

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List of abbreviations

AARI - Arctic and Antarctic Research Institute

EEZ - exclusive economic zone

EU - the European Union

FESCO - Far Eastern Shipping Company

GDP - gross domestic product

ICJ - The International Court of Justice

IMO - International Maritime Organisation

LNG - liquefied natural gas

MARPOL - The International Convention for the Prevention of Pollution from Ships

MOHQ - Marine Operations Headquarters

MSC - Murmansk Shipping Company

NSR - Northern Sea Route

NSRA - The Northern Sea Route Administration

NSRIO - Northern Sea Route Information Office

SAR - search and rescue

SOLAS - The International Convention for the Safety of Life at Sea

the Regulations - the Regulations for Navigation on the Seaways of the Northern Sea Route

UN - United Nations

UNCLOS - United Nations Convention on the Law of the Sea

US - the United States of America

USCGC - United States Coast Guard Cutter

USSR - Union of Soviet Socialist Republics

WWII - World War II

"Russia is a building with the façade turned toward the Arctic Ocean" - Admiral S. Makarov

1. Introduction

Despite numerous legal and academic definitions, the Northern Sea Route (hereinafter also referred to as the "NSR" or the "Route") can be simply delineated as a maritime route connecting Europe with Asia alongside the Arctic shores of the Russian Federation. It is sometimes also labeled as the Northeast Passage for its resemblance with the Northwest Passage, a naval route circulating the North America connecting the Pacific and the Atlantic Ocean through the Canadian Arctic Archipelago (Todorov 2017, p. 62). The main advantage of the Northern Sea Route is the potential to cut the voyage length by some forty percent compared to the mainstream itineraries conducted through either the Suez or the Panama Canal. While the navigation from the Russian arctic port of Murmansk to the Japanese city of Yokogama via the Suez Route measures 24 thousand kilometers estimately, connecting the same points on the map along the coastline of Russia cuts the distance by more than half to about 11 thousand kilometers (Gavrilova, Vakhtin and Vasilyeva 2017, p. 48). What also makes the Northern Sea Route very specific is the great amount of passageways through the Russian arctic narrows and straits. Furthermore, the stark and demanding physical-geographical conditions have a major impact on the vessel navigation (Todorov 2017, p. 62).

The topics of both the Northern Sea Route and the Arctic Ocean, respectively, present a very complex issue which can be looked at from various points of view. Firstly, it represents an issue that is, without a doubt, highly political. Although the Russian Federation seems to dominate the Route and a massive part of the Arctic as well, it is not the sole state involved in the region and interested in the possible utilization of this naval communication. Throughout the years, several political powers have showed their interest in this remote yet geopolitically very attractive area, thus the stakes are high considering the contradictory and rivalry character of the countries involved. The topic deserves attention from the perspective of public international law, too, since legal disputes affect the Route and the region. The Route's legal status and regulation, both international and

domestic, are of utter importance considering the further possible commercialization of this naval corridor.

The climate change has been attracting significant attention due to the weather fluctuations, which are proving to be even more extreme and glaring than ever before. In the Arctic, the region concerned in this thesis, its implications and effects are highly evident and might be even labeled as striking. While the climate crisis undoubtedly poses a massive threat not only to the Arctic region but rather to the planet Earth as a whole, it might also provide an interesting and challenging opportunity. The contemporary mainstream naval routes are being widely used and the crucial so-called chokepoints¹ get relatively congested. Therefore, a possible increase and extension in the utilization of the NSR might bring a welcome relief to the busy straits and shipping corridors.

Last but not least, I think the topic of this thesis is quite neglected when it comes to its coverage either in the academic research field or in the media and press. Various authors agree that gathering sufficient information about the Route proves to be quite complicated. It is practically impossible to stumble upon an academic article or a monography covering the NSR issue as a whole, displaying all of its specifics. Most works are rather focused only on a certain aspect of the Route, such as its historical development, legal regulation or the freight transport technicalities. With this thesis, I would like to shed a new light on the subject matter. The aim of my work is to create a bigger picture of the Northern Sea Route by reflecting on the available academic resources from various and different perspectives.

Due to the aforementioned fact the subject matter is rather neglected and insufficiently covered, research papers and academic journals will serve as my primary source of data and information. Given my objective to create a bigger picture of the topic, I will be using various resources relating to different fields of study, such as law, history, geography or

¹ Choke point is a place of an utter strategic importance for the naval transport, usually a strait or a canal. Such points have been protected for hundreds of years as places of safe passage regardless of the nation or the vessel's sailing flag. Furthermore, the 1982 UN Law of Sea Convention granted additional protection and codified the rules of sailing through such points. Potential incidents or blockades of these chokepoints might have global political and economical consequences (Rosenberg 2018).

economics. Attention will also be paid to the information that stem from the state authorities and offices, governmental agencies and other organizations providing valuable data, statistics and reports mapping the contemporary NSR traffic. In addition to that, the current media and press coverage might serve as a useful source regarding the latest developments and the most topical information.

With regard to methodology, the thesis is going to be a combination of descriptive and exploratory case study. Because of the intricacy of the subject, it is my intention to provide a complex outlook on the Northern Sea Route. Considering the genuine uniqueness of the topic, the gathered findings will not be applicable universally. For that reason, the idiographic method, aimed to focus on the one individual case and study it in depth, will be used. The goal is not only to describe the diverse aspects of the subject but to explore the links between them and to ascertain their effects on the Route's operation and prospective development just as well. To accomplish that, the thesis is going to be structured into several chapters.

First of all, the NSR history and its gradual developments will be presented in order to get an elementary idea of the topic and its evolution throughout the years. The consequent chapter will focus on the legal aspects of the Route. On a theoretical level, certain key concepts and basic principles of international law, admiralty law and law of the sea will be presented and followingly, some empirical data and actual examples regarding the territorial disputes and legally contested areas will be applied to those. This is in order to find out how the legal notions and opinions of Russia and United States comport with the established norms of international public law. Furthermore, the Russian domestic legislation regarding the NSR will be presented, too, since it is related closely to the international regulation and affects the NSR significantly. A concise outlook on the climatic and environmental aspects as well as the Arctic ice melting projections will follow. The fifth chapter is dedicated to the economical matters concerning the topic and it also includes a brief outline of the global contemporary freight shipping situation and the alternative routes.

By analyzing these various aspects of the topic, I aim to present the whole subject as comprehensively as possible. Based on that, I will be able to point out both the advantages

and disadvantages of the Route and make a prediction about what the future holds for this naval communication. The findings gathered throughout the thesis will be summarized and I will try to answer the three following research questions:

1. How do the US-Russian territorial disputes and the Russian domestic legislation affect the NSR?
2. What would be the economical implications of increasing the NSR traffic volume?
3. What are the major obstacles and barriers hindering the possible NSR development?

2. History and development of the Northern Sea Route

The first full-fledged chapter of this thesis will be dedicated to the historical aspects of the Northern Sea Route and the Arctic region in general. I will try to summarize the key historical events in the area from the very first discoveries in this remote and scarcely hospitable land, throughout the consequent progression to the latest developments regarding the Northern Sea Route. This chapter will try to introduce the key milestones in the history of navigating and seafaring in and through the northernmost waters of our planet, in order to understand the topic of the NSR and the consequent questions that arise with it.

2.1. The Age of Discovery

With the Spaniards and the Portuguese dominating the seas and oceans of the Southern Hemisphere during the Age of Discovery, it was only a matter of time before their maritime and exploration competitors started looking for some alternative routes to reach the distant and mysterious lands of the Orient.

The English were among the first ones to try to do so. By the middle of the 16th century, the English geographers and researchers managed to persuade the sailors and the tradesmen the shortest shipping lane leading to Cathay² leads through the unknown lands lying far north from the Old World. As it turned out years later, they were quite right about that. In 1553, an expedition consisting of three ships led by Sir Hugh Willoughby set off on the river Thames, while its departure was followed by a great joy and salutations to the juvenile king Edward VI (Gordon 1986, p. 244).

When sailing by the coast of the Danish territory which later became known as Norway, a violent storm hit the sailors around the area of Lofoten and one ship separated from the others. Its crew spent a week waiting for the remaining vessels at a meeting point in Vardø, however, the whereabouts of the two other ships were still unknown. In reaction to that, the sole ship anchored in the Bay of St. Nicholas³, close to today's city of Arkhangelsk. The other two ships kept sailing around Lapland and even approached to a

² An alternative name under which the North China was familiar to the medieval Europeans.

³ Historical English maps used this name for the entire area of the White Sea.

one-day sail distance from the White Sea, however, the garrison of both ships, counting seven dozens of people and including the expedition leader Sir Hugh Willoughby, had no idea where they might be. The separated sailors never reunited with the rest of their expedition and perished estimateably by early 1554. Their remains were found several months later during the short arctic summer by Russian fishermen, and while the cause of their death will probably remain unknown, there are various theories explaining it. It was for a long time believed the adventurers decayed because of starvation, low temperatures and illnesses, such as scurvy. However, according to some posterior findings, the seamen might have died because of carbon dioxide poisoning, which later became a deadly hazard when exploring cold and unknown remote areas, such as the Arctic. The following year, on the occasion of setting up trade relations with the Tsardom of Russia, the English delegation in Moscow was informed about the discovered remains of the arctic naval expedition. Later, the five consequent expeditions aiming to find either the Northeast or the Northwest passage met the very same fate as Sir Willoughby and his companions did (Gordon 1986).

Besides the Englishmen, another successful seafaring nation, the Dutch, also attempted to conquer and explore the Arctic unknown. At the very end of the 16th century, precisely in 1596, the expeditions led by Willem Barents and Jacob van Heemskerck attempted to find a way through the Northeast Passage. Their intentions were not met with complete success, though, for the mariners only got as far as Novaya Zemlya (Skaridov 2010, p. 286).

Similarly, the Russian scholar and diplomat, Dmitry Gerasimov, articulated the possibility of connecting the Pacific Ocean with the Atlantic in 1525 already (Liu and Kronbak 2017, p. 435). Shortly afterwards, the Tsardom of Russia also started pushing for the Arctic expansion under the name of the state. Most of these efforts were concentrated on the river Taz flowing in Western Siberia. For a long time, however, the explorers could not reach further than the Lena river estuary. In the middle of the 17th century, a groundbreaking success came when the Dezhnev expedition got to the sea and straits later named after the famous Dane, Vitus Bering. It was the Danish seafarer and his Great Polar Expedition between 1733 to 1743 that helped the Russian Empire attain various achievements by discovering and conquering new lands and mapping the

extensive area reaching from Arkhangelsk to Cape Baranov (Skaridov 2010, pp. 286-287).

2.2 19th century breakthrough

Another story of arctic discovery that highly resembles the aforementioned expedition of Sir Willoughby is the one of Julius von Payer. Remarkable is the fact that Payer was born in 1843 in the Bohemian part of Austria-Hungary, a rather unusual place of origin for a polar adventurer and seafarer. Payer was a renaissance man of many interests, who kicked off his career in the army and gave a great account of himself in the Battle of Custoza in the Austro-Italian War of 1866. Later, Julius moved on to alpinism and mountaineering which he also used for conducting geographical surveys. He utilized the acquired knowledge by teaching cartography at the Military College in Vienna (Höhn 1991, p. 165).

Based on his expert knowledge, he joined a German expedition headed to northeast Greenland. Therefore, to this day, some places in this part of the world's largest island the expedition researched still carry German-sounding names. However, the Payer's main achievements, important also for the purposes of this work, were yet to come. With his colleague he developed an idea that the space inbetween Spitsbergen and Novaya Zemlya archipelagoes might be comparatively ice-free. They conducted a preparative expedition in 1871 and achieved a maximum northern latitude of 78,5°. Following their return, based on the expedition's relative success, von Payer eventually managed to negotiate governmental support to conduct an extensive voyage leading far north. A year later, Julius and several other experienced seamen got a green light and set off for a new adventure that would later be met with success. The sailors accidentally discovered a vast archipelago which they decided to name Franz Josef Land, in honor to the then-incumbent emperor of Austria-Hungary. In spite of the land being discovered by the envoys of Austria-Hungary which possessed no coastline at all, the central European monarchy made no territorial claims for the newly discovered land (Höhn 1991, pp. 165-166).

Apparently, based on the first expeditions and sailors' experiences, several conclusions could have been drawn. Despite the uneasy conditions, shipping through the Arctic waters proved out to be possible given the technical options back then. As it turned out, it was

only a matter of time until a full sail round the Eurasia was completed. However, it came across various difficulties and challenges, most of them being of a physical-geographical nature. Julius von Payer later depicted those struggles and obstacles in some of his paintings⁴.

2.3 Further developments and the first sail through

Based on the routes established by von Payer, the first transportation and cargo shipping was started in the western section of the Route, especially between the mouths of the two longest Russian rivers Ob' and Yenisei and the city of Arkhangelsk (Vakhtin 2019, p. 54). Over the years, between 1874 and 1919, 122 trips were recorded on these routes. Seventy-five of those were successful, which is a great progress compared to the previous arctic navigation attempts (Gavrilova, Vakhtin and Vasilyeva 2017, p. 46).

It was the Swedish aristocrat named Nils Adolf Erik Nordenskjöld who became the first one to make the first successful voyage all across the Northern Sea Route itinerary. He managed to do so between the years of 1878 and 1879, just shortly after the Payer's expedition. To achieve his goal, however, he and his crew were forced to spend several months inbetween the two sailing seasons stuck halfway through with their ships getting frostbound. It then took a while until the Nordenskjöld's actions were repeated. In the beginning of the World War I, the Russian icebreakers Taimyr and Vaigach managed to do so and completed the full NSR sail through. too. Few years later, between 1918 and 1919, the legendary polar adventurer from Norway, Roald Amundsen, also successfully conducted the same venture. All of the aforementioned actions and expeditions, however, shared the same fate of becoming icebound and completing the rest of the venture in the next navigation period (Vakhtin 2019, p. 55). In 1912, Russia founded the Hydrometeorological Service and made the exploration and development of the Arctic one of its top priorities. Oceanographical and hydrographical mapping efforts intensified, icebreaker fleet was being constructed and the first search and rescue (SAR) projects and infrastructure were introduced (Skaridov 2010, p. 287).

⁴ See the appendix no. 1 portraying the abandoned and icebound expedition ship Tegetthoff.

Completing the Great Trans-Siberian Railway in 1911 was also an important milestone for the Northern Sea Route. The Tsarist state apparatus' perception of the Route shifted towards a more positive view and the freight transport connecting the estuaries of the rivers Kolyma and Lena with Vladivostok, the capital of the Russian Far East, was given a green light. Five years afterwards, the railway from St. Petersburg to the arctic city of Murmansk was finished. By this, Russia managed to connect the both endpoint ports of the NSR by land (Vakhtin 2019, p. 54). Thus, Russia practically created a strategic parallel transportation structure⁵, one laying on land and the other one leading through the sea.

The NSR was sailed through in one season for the first time in 1932 from Arkhangelsk to Petropavlovsk, the capital of Kamchatka (Gavrilova, Vakhtin and Vasilyeva 2017, p. 47). Otto Schmidt, the Soviet scientist and polar explorer, was in command of this voyage conducted by the Sibiriyakov icebreaker (Skaridov 2010, p. 283). The trip was repeated several times in the upcoming years and by the mid-1930s, sails alike, undertaken mostly in the short Arctic summer period between July and September, became quite regular. In the middle of the 20th century the NSR could have been perceived as an established and set up navigation corridor. Nonetheless, given the Route's extreme conditions, high costs and technical difficulties, its commercial use remained a last resort and was only allowed in the times when there was no other safe transport alternative, such as during the war. As apparent, Russia was well aware of the strategic potential not only of the NSR but rather of the Arctic region in general (Vakhtin 2019, p. 55).

2.4. Geopolitical and strategical importance of the NSR

It is possible the Russian Empire started considering sailing through the entire length of the Route seriously after being defeated in the Crimean War in 1856, with these intentions being relatively independent on the successful actions of the polar explorers. After the defeat, Russia became aware of the limits of its political power and geopolitical outreach on the European continent and started looking in the northern and eastern direction instead (Vakhtin 2019, p. 55).

⁵ See the appendix no. 2 illustrating these communications.

The following accelerated Arctic exploration and NSR development followed and reflected the global geopolitical situation and the Russian position in the international politics field to a large extent (Josephson 2014, p. 22). With the increasing Russian involvement in the Far East region, yet another armed conflict occurred. After the decisive Japanese victory in the Battle of Tsushima during the Russo-Japanese War in the beginning of the 20th century, some critical voices appeared, saying had the Russian squadron been given the possibility to reach the Pacific Ocean via the NSR, the Russian Empire could have avoided the loss. The same argument was used regarding the Russian Civil War, a conflict between the Bolsheviks and the fragmented opposition, the so-called White Army. The leader of the anti-Bolshevik forces, admiral Kolchak, attempted to get supplies and resources to the distant Siberian areas right through the Northern Sea Route. Several years later, the Route once again became a useful and valuable assurance for the Soviet Union during the Japanese occupation of Manchuria when the Japanese neared the Trans-Siberian railroad significantly. By exercising control over the Route, the Soviets definitely felt more secure (Vakhtin 2019, pp. 55-56).

2.5 World War II

In spite of the previous developments, the World War II might probably be seen as the most crucial and breakthrough era for the NSR development. Until then, the Arctic and the Arctic Ocean remained relatively untouched and unutilized as one of the very few regions in the world, which in effect ensured and strengthened the security of its coastal states. But that was about to change. In 1937, the British journalist named Harry Smolka published an article called "Soviet Strategy in the Arctic" in the famous journal *Foreign Affairs*, where he predicted that the Soviet Union is about to embed Murmansk as its staple naval base, which would eventually increase the importance of the NSR as well (Brubaker and Østreg 1999, p. 300).

He was quite right about that, for during the WWII, the NSR was the only sea lane used for freight shipping and delivering the supplies from the Soviet allies, most notably from the United States of America. The Axis powers were well aware of that and the Nazis made an effort to destroy the Soviet icebreaker fleet and even developed plans to completely wipe out the Soviet Arctic infrastructure and naval bases (Dremliga 2013, p.

141). According to various authors, such as Vakhtin (2019) and Josephson (2014), the WWII era thus fully demonstrated the strategic significance of the NSR.

2.6 Cold War period

Very shortly after the WWII the global tensions were growing again with yet another massive, although not so conspicuous conflict approaching: the Cold War. And with it, the strategic and geopolitical importance of the Arctic region and the NSR increased once again. The threat of a possible attack rose, but the growing tension also had a positive impact on the NSR development (Vakhtin 2019, p. 56). Both the United States and the Soviet Union exploited the Arctic area for conducting military tests and launching ballistic missiles. With the nuclear armament getting in full swing during the 1950s, the both global superpowers utilized their vast and distant uninhabited lands for testing the deadly weapons of mass destruction. Although the main Soviet nuclear testing site was located on the territory of today's Kazakhstan in Semipalatinsk, the infinite Siberian and Arctic lands were scarred irrevocably by arms testing as well. The most powerful and destructive nuclear weapon ever constructed, the so-called Tsar Bomba, was detonated above the surface of the Arctic island of Novaya Zemlya, but aside from that, many more tests were conducted over the years in the area of this polar archipelago (Bříza 2011, p. 77).

In reaction to the Cuban Missile Crisis, the Soviet Union initiated a determined plan to reinforce and invigorate its Navy, most notably the Northern Fleet residing in the Kola Peninsula. In addition to that, the USSR started exploring the possibilities of submarine transport in the Arctic Ocean and along the Northern Sea Route. The United States and their allies in Western Europe believed the USSR might use the Route in state of emergency to quickly move its warships and even the nuclear submarines from Vladivostok to Murmansk or vice versa. Although these assumptions might be doubted on the grounds of feasibility and viability, there might be some true to it. The creation of a national security zone in the north of the Soviet Union with remarkable number of military personnel being deployed, as well as the American attitude towards the Route both present evidence those assumptions were not unfounded (Brubaker and Østreng 1999, pp. 301-305). In any case, it is undisputable that due to the WWII and the Cold War events some essential infrastructure and facilities necessary for marine navigating and

cargo shipping on the NSR were established by the beginning of the 1980s (Gavrilova, Vakhtin and Vasilyeva 2017, p. 48).

2.7 End of an era

With the power of the Soviet Union slowly declining and the end of the Cold War approaching conclusively, it became more and more apparent the Union of Soviet Socialist Republics is very unlikely to stick together and not to fall apart. The last Soviet leader, Mikhail Gorbachev, was indeed aware of the fact and realized that partial change of direction in terms of the Soviet policy, both internal and foreign, was inevitable. In 1987 he appeared in Murmansk, one of the key NSR points, and gave a speech regarding the global joint action and collaboration in the Arctic and proposed to set up international commerce and start shipping along the Route (Zalyvsky 2015, p. 32). Interestingly, the NSR was actually unsealed for international shipping in 1967 already, but considering the very low awareness and the scant amount of information about the Route and its specifics and safety, none foreign company or vessel showed interest in conducting the voyage (Skaridov 2010, p. 294).

Unfortunately, the early 1990s recession and various economic crises had a very negative impact on the Northern Sea Route operation. After the dissolution of the Soviet Union, the traffic on the Route dropped rapidly and became quite sporadic, with only one or two ships conducting the journey in some years (Gavrilova, Vakhtin and Vasilyeva 2017, p. 48). This does not come as much of a surprise considering the poor state of global economy in the early 1990s, as well as the insecurity originating from the major changes happening in the field of international politics following the termination of the Cold War and the end of bipolarity in the world global order. But the Soviet leaders understood that the times were changing and knew they had to act in order to obtain some economical advantages and benefits for their country. This sense resulted in what some other countries, such as the United States, were calling for for a long time before: opening the NSR to the international community (Solvang et al. 2018, p. 496). Then still existing Soviet Union did so by issuing the Regulations for Navigation on the Seaways of the Northern Sea Route, authorized by the Minister of the Merchant Marine on September 14th 1990 and formally published on July 13th 1991. Its soundness and cogency were

later validated by Order No. 73 of Ministry of Transport, released on June 18th 1998 (Dremluiga 2013, p. 143).

2.8 Internationalization and opening to the world

The number of ships transiting the NSR, however, remained very low in the beginning of the 21st century as well. According to the information available from the Russian Ministry of Transport, only two ships made the journey in 2007, three vessels a year later and a total of five ships during the year of 2009 (Gavrilova, Vakhtin and Vasilyeva 2017, p. 48). Notwithstanding, a major breakthrough came in 2010 when the Norwegian private shipping and logistics company named Tschudi Group managed to conduct the very first journey via the NSR that resulted in reducing the operating expenses and costs savings. Such an extraordinary conduct naturally did not remain unnoticed and thus, soon after, various shipping companies started turning their attention to the NSR. This resulted in an upsurge of interest in the Route and the number of passages increased rapidly (Milaković et al. 2018, p. 54). According to the Northern Sea Route Information Office⁶ (NSRIO), there were 41 successful passages conducted in 2011, five more in 2012 and finally 71 vessels conducted the journey in 2013, which is the highest number of accomplished transit passages per year so far⁷. Nevertheless, despite these record numbers, the amount of cargo transport as well as the number of ship transits decreased yet again in the consequent years. There were several causes to that, such as lower container prices, tough ice and weather conditions or the lack of cargo loads to be transported (Milaković et al. 2018, p. 54).

In the the last few years, however, the shipping companies' interest in utilizing the NSR to transport cargo is on the rise again. According to the statistics with the data gathered and provided by the NSRIO, the number of vessels entering the Route and transiting through is gradually and constantly increasing year by year since 2015⁸. While 18 vessels

⁶ A collaborative project between the Norwegian non-profit organization Centre for High North Logistics and the Russian state-owned corporation Rosatom, which focuses on nuclear energy. The NSR Information Office aims to provide data, information and statistics regarding the NSR traffic and voyages.

⁷ Data taken from <https://www.pame.is/projects/arctic-marine-shipping/older-projects/northern-sea-route-shipping-statistics>.

⁸ Full and detailed statistics available at <https://arctic-lio.com/category/statistics/>.

transited the NSR in 2015 and 19 ships a year later, the total number increased by ten to 29 ships in 2017 and remained the same in 2018. For the annual statistics and data, see the appendix no. 3 showing various specifics such as the technicalities regarding the vessels, the type of cargo transported, details like the ports of entry and exit or the total time spent on the voyage.

Finally, in 2019, the aggregate number of vessels that sailed through the NSR increased to 27, conducting 37 voyages overall. Compared to 2017, the amount of cargo transported via the Route almost tripled in 2019, totalling the quantity of 31,5 million tons of freight⁹. After 2020 is over, it might be quite interesting to see what the effect of the COVID-19 pandemic will be on the total number of transits. As elaborated below, the main NSR navigation season lasts from June to November. As for May 2020, only two transits, one to the Russian port Nakhodka and the other one to the Chinese Yangkou were conducted. Otherwise, only the western section of the Route between Murmansk and Sabetta has experienced intensive traffic, mostly related to liquefied natural gas (LNG) transports. The number of sails to the European ports has been rather low as well. For details, see the appendix no. 4 depicting the May 2020 traffic activity, routes, vessel types and the purpose of the voyage.

⁹ Statistics available at <https://arctic-lio.com/nsr-shipping-traffic-transits-in-2019/>.

3. Legal aspects

Considering the very low traffic intensity and number of voyages along the NSR in the past, for a long time there was virtually no need to precise, specify or update the rules and legislation regarding the Route (Dremluiga 2013, p. 142). This has, however, changed with the increasing commercial appeal of the NSR and the reduction of ice and frozen areas over the last decades. The intensifying traffic as well as the Russian intentions to utilize and exploit the NSR's potential also cannot be neglected (Gavrilov 2015, p. 256). And even though all of these aspects have certainly had a significant impact on the Russian marine and Arctic legislation development during the last decades, they were not the sole cause to that.

3.1 US-Russia legal dispute

Although the Cold War days are now long gone, the rivalry and antagonism of both countries still persist. There is a legal dispute between the United States of America and the Russian Federation lasting for decades which highly resembles the juristic and rhetorical argument regarding the Northwest Passage between the US and Canada where the Canadian position and argumentation is relatively similar to the Russian attitude towards the NSR. The kernel of the US-Russian argument is simply whether there is freedom of navigation in certain parts of the Arctic that overlap the NSR lanes or if these areas are sovereign and thus a subject to the Russian national regulations.

During 1963, the United States Coast Guard Cutter (USCGC) icebreaker *Northwind* conducted a hydrographic research and gathered information in the Arctic Ocean and the Laptev Sea, and the United States did so without obtaining the permission from the Soviet Union. A similar event followed during the next summer when the USCGC icebreaker *Burton Island* set off to explore and research the East Siberian Sea, also without the consent of the Soviets. The USSR unsurprisingly disapproved of such actions, which resulted in legal arguments and exchange of diplomatic notes with the U.S. embassy in Moscow. According to the Soviets, the NSR, a naval communication stretching along the Soviet Arctic shoreline, is very distant from the customary, long-established marine itineraries and by the time, it served solely the purposes of Soviet vessels. A significant portion of the Route leads through the Soviet territorial and internal waters, including several straits that are of strategic importance and over which the Soviets have historically

and continually exercised control. Hence the Soviet Union asserted that foreign ships are prohibited from crossing such waters without the precedent approval of its political representatives (Gavrilov 2015, p. 259).

The United States, on the other hand, contested such argumentation and claimed that various narrows along the NSR, such as the Kara, Laptev, Sannikov, Shokalsky and Vilkitsky Strait, are of international nature and therefore, the freedom of navigation and the right of innocent passage¹⁰ shall apply accordingly. Additionally, the US heckled the Soviet Union one more time in 1967, when a USCGC icebreaker entered the Kara Sea and proceeded in the Vilkitsky Strait direction. But this time, after the Soviets objected, the US retracted and called off the expedition (Gavrilov 2015, Todorov 2017).

3.2 International straits

3.2.1 History-based sovereignty claims

When deciding whether the waters of straits are international or not, the historical perspective and customary usage have to be started with. In accordance with international law and the United Nations Convention on the Law of the Sea (UNCLOS), a country can demand waters to be labeled as internal under the condition it proves it has continuously practiced sovereignty and exercised authority over them for a significant amount of time. In addition to that, however, international law principles and customs require one more aspect to be fulfilled in order for a country to make legitimate historical claims over certain area or waters. That is approval and consent of other states, particularly of those immediately involved. However, apart from the United States, no other country has either questioned Russian claims or supported the US position in this legal dispute (Todorov 2017, p. 65).

¹⁰ Todorov (2017) points out to the inconsistency and confusion of the US rhetorics in mixing the terms of *freedom of navigation*, *innocent passage* and *transit passage*. While the first mentioned represents a general international law principle of free movement of vessels, the other two specify the particular legal regime. The right of transit passage constitutes a more laid-back jurisdiction, the innocent passage regime, on the other hand, contains more restrictions and is not as advantageous for the vessel as the transit passage.

Although there are legal experts whose opinions are in favor of one or the other side (unsurprisingly, the American authors and lawyers usually support the US position and vice versa), the whole dispute thus remains unanswered unless a body with jurisdiction over such issues like the International Court of Justice (ICJ) is referred to and presented the case for its consideration. The Soviet Union has applied the aforementioned historical principle in the past and this tenet was reflected in the special decrees issued by the Soviet Council of Ministers on February 7, 1984 and January 15, 1985. In these orders the USSR drew straight baselines alongside its jagged and indented Arctic shores. To illustrate the baseline reflecting the Soviet claims, as well as the water areas contested by the United States, see the appendix no. 5.

3.2.2 Geographical and functional criterion

Even when assuming the American position is correct and considering the various straits alongside the NSR international, there is a bit more to it. As the title of this subchapter suggests, for straits and narrows to classify as international, two criteria - geographical and functional - have to be fulfilled. These requirements were declared and affirmed by the ICJ in the Corfu Channel Case decided in 1949. According to this ICJ ruling, the strait has to be located in between the high seas and thus connect international waters (geographical criterion) and it must serve the purposes of international navigation (functional criterion). However, from the judgment it is not clear whether both of these aspects have to be present or if one of the two is sufficient itself (Gavrilov 2015, Todorov 2017).

Once again the experts' opinions vary and even if the functional criterion was to be considered adequate and satisfactory, another problem arises. As the ICJ pointed out in the Corfu Channel ruling, the traffic intensity has to be taken into account with regard to the functional facet. The NSR traffic, as mentioned previously, has developed very slowly and was counted by dozens even in its records years, not to mention the fact the shipping intensity was close to zero during certain navigation periods. Moreover, a significant portion of vessels entering the NSR corridor sails under the flag of the Russian Federation. Hence the functional aspect and therefore the international character of the Route might be doubted on these grounds. Thus, both Todorov (2017) and Gavrilov (2015) agree the Russian position and argumentation is stronger and more convincing in this Arctic legal

dispute. Additionally, it is also quite controversial the United States contest the Russian legal argumentation by claiming and invoking some of the UNCLOS provisions despite not being a signatory party to the treaty.

3.3 International law and regulation

Not only the above-mentioned legal disputes, but also the increasing volume of traffic, Russian future intentions and the non-negligible uniqueness, vulnerability and ecological sensitivity of the whole Arctic ecosystem all contributed to the need of legal regulation and creation of specific rules. Due to all these factors the NSR deserves particular consideration and thus, throughout the years, the Route and its various related aspects became a subject to both international regulation and Russian domestic legislation.

3.3.1 United Nations Convention on the Law of the Sea

Although the NSR is regulated mainly by the Russian national law, it does not remain untouched by international law and its provisions. The UNCLOS, an international agreement signed in 1982, constitutes the main legal framework within the system of international public law in relation to the World oceans and waters, seafaring, natural resources and the environment protection connected with it. The Convention contains various provisions relevant to the NSR with implications to the Arctic navigation as well.

The Article 98 regarding the duty to render assistance imposes an obligation on the coastal state to assist in the SAR operations. It is therefore a Russian duty to actively participate in ensuring and maintaining the SAR services shall any inconveniences occur to vessels conducting the NSR voyages. Furthermore, the Russian Federation has to cooperate with its neighbouring countries by mutual agreements for the purpose of providing safe and secure sails. Based on the Article 41, Russia has the right to set up navigational corridors and regulate the marine traffic in the Arctic straits to safeguard a secure passage (Skaridov 2010, p. 290).

Of major importance is the Article 234 which entitles the littoral states to enact non-discriminatory legal acts for averting, limiting and supervising sea pollution from ships entering the icy Arctic areas and to compel of their observance. In accordance with these UNCLOS provisions, Russia can do so within the scope of its exclusive economic zone

(EEZ) in the ice-covered areas that are exposed to the harsh weather and climatic conditions (Blanco-Bazán 2009, p. 383).

Rossi (2014) even labels the provisions of the Article 234 of the UNCLOS as a "crowning achievement" for the Russian and Canadian diplomacy (especially in relation to its aforementioned Northwest Passage legal dispute with the US). As he puts it, even though neither of these states exercise absolute sovereignty and control over the area of the Arctic, they are vested in a significant amount of discretion and regulation competences. Gavrilov (2015) agrees with these statements and admits that despite the fact Russia has not broadened its authority and jurisdiction across all of the NSR, the international shipping along the Route is practically under exclusive Russian command. Furthermore, he notes it is virtually impossible for foreign vessels to enter and navigate the Route without at least partial assistance from the Russian Federation in terms of icebreaker support, pilotage, guidance or aerial weather monitoring. The Article 234 of the UNCLOS therefore contains some highly important provisions that serve as an underlying foundation for the Russian domestic legislation regarding the NSR.

3.3.2 International Maritime Organization

As a special agency within the United Nations (UN), the International Maritime Organization (IMO) has the sole and exclusive right of issuing international regulations and ordinances regarding the shipping safety, maritime navigation and the potential sea pollution resulting therefrom. Amongst the most important and successful drafted and adopted IMO measures are the International Convention for the Prevention of Pollution from Ships (MARPOL 73/78) and the International Convention for the Safety of Life at Sea (SOLAS). In relation to the Arctic waters and thus the NSR, the IMO Safety Committee in cooperation with the IMO Marine Environment Protection Committee drafted and approved the Guidelines for Ships Operating in Arctic Ice-covered Waters. Although its provisions put higher demands on the states in comparison with the SOLAS treaty and are more of a recommendatory nature, the states are encouraged to include them into their national law in order to increase the protection of the fragile and ecologically sensitive polar areas. The IMO does not neglect the various perils the vessels encounter when sailing in the NSR alike conditions. Severe weather conditions, cold temperatures and the omnipresent ice as well as the uneasy communication and the SAR

services all increase the requirements on the ships entering these areas. Oil and fuel spills and their consequent removal also present a very complicated task. For this purpose, a hierarchy of polar classes of vessels was created to reflect on the ships' arctic efficiency and icy environment capabilities (Blanco-Bazán 2009, pp. 381-386).

The Russian Federation is also obliged to inform the IMO and consult with it in case of setting up naval corridors and developing traffic plans in the EEZ according to the IMO Resolution A.572(14). The IMO hence presents a certain form of limitation by checking and seeking compliance of the international legal norms and the aforementioned IMO conventions (Skaridov 2015, pp. 290-292). In January 2017, the IMO's Polar Code became effective and put new demands on the safety of navigation. In reaction to that, the Ministry of Transport of the Russian Federation made the Polar Code's certificates regarding the board officers' qualifications and the ship capabilities a mandatory prerequisite for obtaining the license to sail the NSR (Milaković et al. 2018, p. 55).

3.4 Russian domestic legislation

On the domestic level, the Route's organization changed frequently in the past and the legal regulation is shattered between several laws. As a result of that, gathering sufficient information regarding the NSR legal regime turns out to be quite complicated. After all, some authors, such as Milaković et al. (2018) point out to this fact. The difficulty of obtaining details about the Route and seeking the data regarding the rules, organization, conditions or legal regime thus presents one of the main setbacks for the international shipping companies possibly interested in utilizing the NSR.

On the superficial level, one of the elementary domestic statutory acts is the Merchant Shipping Code of the Russian Federation. The Northern Sea Route serves the purposes of commercial shipping and hence various provisions of this codex are relevant, such as the legal definition of a vessel or the principles and rules of ship registration. This legal act also deals with liability in case some inconveniences shall occur. On one hand, the icebreaker master, charterer or owner cannot be held liable for any harm or detriment to the vessel as a result of the guiding and supporting activities. The vessel owner, on the other hand, might be found liable for damages inflicted on the icebreaker or another vessel in the course of the sail. Due to the difficult navigational conditions and the unique

environment, Russia has also adopted the Regulations for Icebreaker and Pilot Guiding of Vessels through the Northern Sea Route. The statute provides various details and requirements regarding the icebreaker support, ice pilotage and it also imposes an obligation on the East and West Marine Operations Headquarters to inform the currently sailing vessels about the weather and navigational issues in order to safeguard a safe and sound passage (Dremluiga 2013, pp. 146-147).

The most important act, however, are the Regulations for Navigation on the Seaways of the Northern Sea Route (the Regulations) issued in 1990 and promulgated a year later. This law practically marked and addressed the opening of the Route to the rest of the World for its commercial use. The document was later reaffirmed by the Ministry of Transport in 1998 by his Order No. 73 (Dremluiga 2013, p. 143). Few years ago, in 2013, the statute was re-introduced to reflect on the demands of the increasing traffic intensity and to mark a new period for the NSR. The New Rules of Navigation on the Northern Sea Route mainly aimed to make the whole process of applying for a permit and then conducting the NSR voyage more simple (Milaković et al. 2018, p. 54). Design, Equipment and Supplies of Vessels Navigating the Northern Sea Route provide the requirements and demands on the vessels. This act thus functions as a sort of procedure protocol to the Regulations and specifies its provisions that are of a more general nature. Furthermore, the vessels also have to comply with the Rules of the Russian Federation Registry. Considering the relatively low traffic volume and shipping intensity, very few litigations have arisen. There have, however, been a few in which the Federal Courts of East and West Siberian region confirmed the importance of the above-mentioned Russian domestic statutory acts and labeled them as legally binding (Dremluiga 2013, pp. 143-149).

3.4.1 Administrative organisation

The administrative organisation of the NSR varied and changed quite a lot historically. In 1932, the NSR Administration (NSRA) was set up and Otto Schmidt, the man who conducted the first historical one-navigation-period sail along the NSR, was put in its command. Such organisational scheme remained until 1954, when shortly after Stalin's death, the Ministry of Maritime Fleet of the USSR was put in charge of the Route. This model functioned for some 16 years and then the operation was turned back to the NSR

Administration. With the dissolution of the Soviet Union, the Ministry of Transportation was vested in the key powers regarding the Arctic navigation and after the adoption of the Merchant Maritime Code in 1999, the Russian icebreaker fleet was turned to private companies. Rosatom, a state owned specialized corporation dealing with nuclear energy, took control over the nuclear icebreakers. In accordance with the 1990 Regulations (and the New Rules as well), Marine Operations Headquarters (MOHQ), a special Russian agency under the command of the NSR Administration, exercises control over the Route navigation (Skaridov 2010, pp. 293-294). The NSRA has commissioned two Russian companies, the Murmansk Shipping Company (MSC) and the Far Eastern Shipping Company (FESCO) to act on behalf of the MOHQs and entitled them to control the Route operations and compliance of various demands and requirements to be mentioned below. Vesting these administrative powers in privately owned shipping corporations seems quite out of the ordinary and is rather controversial because of the permanent potential conflict of interests (Liu and Kronbak 2010, pp. 436-437).

3.4.2 NSR legal definitions

In some of the Russian statutory acts, legal definitions of the NSR can be found. The Article 14 of the Russian Federal Law On internal sea waters, territorial sea and contiguous zone demarcates the NSR as the historically formed national transportation routes of the Russian Federation in the Arctic including various narrows, such as the Vilkitski, Shokalsky, Laptev and Sannikov Strait (Skaridov 2010, p. 289).

Besides that, another NSR legal definition was encompassed in the Regulations. Its Article 1.2 labeled the Route as a national transportation passage of the USSR located within the inland waters, territorial sea or EEZ along the USSR northern shore, with corridors suitable for navigating and guiding in ice (Dremluga 2013, p. 144). Furthermore, the most peripheral points of the NSR routes are bordered with the western entries into the straits of Novaya Zemlya and a meridian passing northward from the Cape Zhelaniya on the western side, 66th parallel north and 168° 58' 37" meridian west on the eastern side. The southern-east waters of the Barents Sea and places in the Bering Sea, such as the Gulf of Anadyr, covered with ice for the most part of the year are among the NSR operating areas, too (Milaković et al. 2018, p. 53).

The latest NSR understanding was then reflected by the New Rules from 2013, which also amended the Russian Merchant Shipping Code. According to the current perception of the Russian Federation, the NSR presents a *"water area adjacent to the northern coast of the Russian Federation that comprises the internal sea waters, the territorial sea, the contiguous zone and the exclusive economic zone of the Russian Federation and is bounded on the east by a maritime demarcation line with the United States of America and by the parallel of the Cape Dezhnev in the Bering Strait, on the west, by the meridian of the Cape Zhelaniya to the Novaya Zemlya Archipelago, by the eastern coastline of the Novaya Zemlya Archipelago and by the western boundaries of the Matochkin Shar, Kara Gate and Yugorsky Shar Straits"* (Gavrilov 2015, p. 257).

The variable and changing legal definitions are caused mainly by the NSR's inconstant and unsteady character. As Gavrilov (2015) points out, there is no single shipping lane or corridor. Instead, the particular route can vary a lot depending on the current weather conditions and ice thickness. Thus, while the ships might follow the littoral contours and coastal banks, they can circumnavigate the vast islands of Novaya Zemlya and Severnaya Zemlya just as well. But regardless of the specific navigational corridor the vessel decides to steer, the NSR is always located within the distance of 200 nautical miles, ergo either in the Russian EEZ, territorial sea or internal waters (Gavrilov 2015, p. 257).

3.5 NSRA requirements

Once a shipping company decides to use the NSR corridor for a commercial voyage of its vessel, several criteria have to be fulfilled in order for it to be able do so and the Northern Sea Route Administration seeks their compliance.

Firstly, the vessel intending to enter the Route has to seek a special permission from the Russian authorities. Its owner or master can do so by filling the form available at the NSRA website fifteen days in advance before the intended commencement of the sail (Todorov 2017, p. 69). The application of admission contains information regarding the vessel and applicant as well as various attachments, such as the certificates attesting the vessel's polar capabilities. The NSRA then has ten days to evaluate the application and make either approving or dismissing decision (Milaković et al. 2018, Dremluga 2013).

Maritime insurance is another requirement that has to be evinced in the application form and poses quite a complicated issue. Navigation and freight transport in such difficult conditions means the risks are very high and the insurance sum is hard to calculate. Many insurance companies do not cover the Arctic and consider it to be an area excluded from trading. It is thus up to the shipping company to negotiate a specific deal and make a special insurance arrangement fitting their needs. This hindrance might dissuade the otherwise interested companies. Therefore, increasing the availability of the arctic maritime insurance is a necessary presumption for making the NSR more sustainable (Milaković et al. 2018, Verny and Grigentin 2009).

When considering the admission, the NSRA also examines the ice conditions in cooperation with the Arctic and Antarctic Research Institute (AARI). Based on the current situation, the AARI rates the conditions as heavy (if 20% or more severe than average), medium or low (at least 20% less severe than average). The classification then affects whether the icebreaker support is necessary or not as well as the particular navigation route. Since the New Rules came into effect, a tariff system was implemented for calculating the price of icebreaker assistance. There are no limiting conditions regarding the ship width or length, however, the draught must not exceed 13 meters. This is because of the depth of the Sannikov Strait located in the rather shallow East Siberian Sea (Verny and Grigentin 2009, p. 113). Besides that, if the ship master does not possess sufficient skills and knowledge about navigating inbetween the icy floes, an experienced ice pilot has to be present aboard. The rates for such services are not officially known, however, Milaković et al. (2018) emphasize the amount might be as much as 1000 USD per person a day.

If the shipping company decides to sail the NSR from west to east, the MOHQ located in Dikson, the Kara Sea port, and the MSC's administration and offices running this part of MOHQ, located in Murmansk, have to be notified in advance in order to conduct inspection of the ship to control its ice capabilities and parameters. Conversely, shall the vessel sail from the eastern part of the NSR, the MOHQ residing in Pevek and the FESCO's offices located in Vladivostok, which run this part of the Route, will be in charge. If the vessel passes the inspection successfully, an authorization to pass through

the NSR is bestowed and the MOHQs schedules the itinerary as well as the specific route (Liu and Kronbak 2010, pp. 437-438).

3.6 Further problems associated with legislation and legal disputes

The efforts of the Russian political representatives and elite to keep their sovereignty over the NSR are clear and their motivation is both economical and military. Even though the Russian national legislation allows foreign subjects to utilize the Route, it is possible only to a certain extent which does not put the Russian domestic and national interests at risk. Some of those aforementioned statutory acts are partly controversial and shipping organisations point out to their discriminatory character regarding the icebreaker assistance tariffs or the above-mentioned comprehensive and rigid NSRA requirements. The Russian demands for the foreign vessels to apply for a permit to enter the NSR corridor and transit, as well as the numerous standards imposed without the IMO's preliminary approval, are contradictory to the international law and law of the sea. Nevertheless, while the national laws and regulations are surely problematic, they are not the main cause of worries (Fahey 2018, Nilsson 2014).

But the international importance of the Arctic and the supra-national disputes are. The political representatives of Russia are aware of this and realize the need for cooperation on supra-national level, at least to a certain extent. In 2010, after four decades of disputes and diplomatic dialogues, Russia and Norway reached a consensus regarding the demarcation of the Barents Sea borders. Shortly afterwards, both countries agreed on using a system reporting the naval traffic therein. Vladimir Putin, the president of the Russian Federation, stated that "the Arctic is a zone for peace and cooperation in which states should jointly ensure economic, security, scientific and educational progress while retaining the cultural heritage of the North". To reaffirm these words, in 2013, Russia agreed granting the Arctic Council observer status to six non-Arctic nations (China, Japan, Singapore, South Korea, India and Italy). However, the countries are excluded from any decision making process (Nilsson 2014, pp. 34-36).

Still, most of these actions are rather symbolic and rhetorical; joint action and cooperation is conceivable only under the assumption that the Russian Federation gives consent to it. As Rossi (2014) accentuates, it is highly probable the United States will retain their position and keep remonstrating continuously, driven by the aim to defend their strategic goals and to keep their words that the global freedom of navigation is their utmost interest. Moreover, there is a risk of further disputes coming up. Russia seeks recognition of the international community that the Lomonosov Ridge and the Mendeleev Ridge are connected to the Siberian Shelf. If other nations acknowledged this, the Russian diplomacy would be entitled to make further claims over extensive areas of the Arctic Ocean. Such ambitions collide with the Danish and Canadian pretenses, though. According to the UNCLOS, when contradictory claims arise, declaring sovereignty over the contested area is only possible if all the concerned parties acquiesce. Approval of Denmark and Canada is, however, very improbable because of the Russian annexation of Crimea (Nilsson 2014, p. 37).

These prospects thus undermine the importance of the international law norms in the eyes of many Russian representatives and authorities. Several Russian polar researchers and maritime experts, who also happen to be supporters of the ruling party United Russia and Vladimir Putin, consider international cooperation and multilateral agreements a threat and believe they might deprive Russia of its vast Arctic territories. On top of that, the dangerous calls for reinstating the Russian imperium by dominating as much soil and land as possible are getting stronger. Therefore, the territorial disputes might go off in the upcoming years. Besides, the global warming is undoubtedly going to add oil to the fire and worsen the legal and diplomatic conflicts quickly. The melting ice is going to make it easier for the foreign ships to utilize the Route and not obeying the Russian instructions will become more likely since there will not be only one set corridor inbetween the ice floes (Nilsson 2014, p. 37-38).

The need for determining the legal regime and status of the NSR clearly is apparent. Settling the territorial disputes peacefully is in the best interest of all the involved actors. Otherwise, the conflict might escalate and cause the global tensions to grow. Clarifying the legal issues is also desirable for the shipping companies possibly interested in using the NSR as an alternative shipping passage. Although no other country has explicitly

joined the US-Russia territorial and legal dispute, the situation can change in the future. It is likely the foreign shipping companies would prefer the waters of straits along the Route to be labeled as international and therefore, some other countries might support the American legal reasoning. As Todorov (2017) puts it, the expected increase in traffic intensity, as well as the number of non-Russian flagged vessels transits rising, might strengthen the argument for designating the contested NSR straits as international. With the NSR shipping growing and the Russian argumentation not being so persuasive anymore, the disputes can soon deteriorate sharply. Thus, reaching a certain compromise between both sides to ensure the interests of shipping companies and the Russian Federation are balanced, is crucial to prevent the geopolitical situation in the Arctic from worsening. Admittedly, Russia enjoys some unquestionable sovereign rights in the area. However, if its officials strive to attract the shipping companies and foreign investors, their attitude towards them has to be more accommodating.

4. Climatic and environmental aspects

4.1 Weather conditions

As of now, the main NSR navigation season lasts for about five months from July to November (Zhang, Meng and Zhang 2016). Currently, one of the most stable months for transiting the NSR in terms of weather and ice conditions is August, when there is a 40% chance of the ice and floe situation being good at both eastern and western section of the Route. Months at the beginning or end of the navigation season, such as May or October, are much more wayward and unpredictable. While the weather situation can be relatively good on one side, chances are that it differs significantly on the other. However, as the appendix no. 6 shows, even during the summer navigation period certain segments of the Route are quite likely to remain at least partially covered by ice. The East Siberian, Laptev and East Kara Seas are amongst the most probable to be frozen (Liu and Kronbak 2010, pp. 436-438).

Given the length of the whole Route, it should be noted that several different climatic areas are to be found along it. The Atlantic area, encompassing the Barents Sea and the west Kara Sea, can be characterized by frequent storms in the winter season and heavy precipitation during the summer period. The so-called Siberian Area in the middle, covering the east Kara Sea as well as the Laptev Sea and the East Siberian Sea, is affected by the Siberian low. Therefore, the winter temperatures drop far below zero in winter and the summers are quite hot on the other hand. Finally, the Pacific area, embracing the western section of the East Siberian Sea and the Chukchi Sea does not get that cold during winter, however, the ships are likely to encounter frequent winds, storms and fogs when passing through this area. The fogs are most likely to occur in summer close to the concentrated ice. The misty hazard, however, might be encountered all year long across vast areas of the NSR, not only in its easternmost section. The hazes, formed in the proximity of old multiyear intense ice, persist for most of the year and make thus for one of the biggest navigational perils. The blowing snow and blizzards are probable to be experienced especially in June and October. In autumn, between September and October, the most severe waves, reaching the height of four to five meters, are formed. Soon after, however, most of the NSR with the exception of the Chukchi Sea starts freezing. In May, the ice cover is the thickest and reaches between one to two meters. The old multi-year

ice might even exceed the thickness of three meters. In mid-June, the ice cover starts melting on most of the seas and thus marks the beginning of the main navigation season (ABS 2014).

4.2 Melting ice projections

The long-lasting and constant ice reduction is one of the main reasons of the rising interest and the potential increasing viability of freight shipping along the NSR. Aerial monitorings show a long term ice cover retreat throughout the whole year but with the summer seasons having the most striking effect. The comparison from 2007 shows that Arctic sea ice levels shrank to 4,3 million square kilometers compared to 7,5 million kilometers in 1979, which presents a reduction of massive 40 %. To illustrate this, see the appendix no. 7. Note that the ice levels are receding more significantly along the Russian shoreline in comparison with the Canadian Arctic Archipelago, making the NSR prospects look better compared to the Northwestern Passage. The year 2006 marked the first time when the NSR was ice free to the hilt (Liu and Kronbak 2010, p. 436).

According to the historical progression as well as the models presented by Khon et al. (2009), during the 21st century, a prolongation of an ice free passage for up to six months a year can be expected. Thus, as long as the atmospheric greenhouse levels keep growing, the number of days when the navigation is possible on the NSR corridors will keep increasing. As a consequence, the NSR might become an actual and effective alternative passage in the course of this century, with the perks of saving costs compared to the Suez Canal transit (Khon et al. 2009). To see what the Arctic ice levels prospects and estimates look like for the upcoming decades, take a look at the appendices no. 8 and 9. As Bekkers, Francois and Rojas-Romaloga (2016) note, in some areas, the ice is receding even more rapidly compared to the forecasts. Therefore, in the upcoming years, the Arctic and the NSR might become ice-free during the month of September, too. Moreover, according to the appendix no. 9, in the next decade, enough ice caps and massifs will melt to make the Route ice-free for even bigger part of the year. It is, however, unclear whether such conditions will prevail during the whole year. Ever since the NSR was opened for international freight shipping by the late 1980s, the number of navigation days has prolonged by about 40. As apparent from the appendix no. 10, so far, the progression has corresponded quite accordingly with the most accurate models. This steady growth is

expected to continue and even become a bit faster. Hence, by the end of this century, the NSR is estimated to be navigable for more than 120 days.

4.3 Environmental impact

With the predicted increase in traffic volume along the NSR, the questions regarding the Route's environmental impact come to mind, too. The Arctic ecosystem is very unique and fragile and thus, the concerns relating to its protection are unquestionably substantial and justified. In the literature, there is no clear consensus on whether the expected growth of shipping intensity in the Arctic will have a beneficial effect on the environment, pollution and the amount of emissions or not.

The prime hypothesis of shortening the shipping distance, which would reduce the vessels' fuel consumption and hence decrease the environmental impact, seems quite reasonable and rational. The studies conducted by Schøyen and Bråthen (2011) showed the correlation between the diminished number of days on the sea and the ship's fuel efficacy. Solvang et al. (2018) support this argumentation by stating the container ships are among the vessels with the worst CO₂ emissions, which are about the same level as those of crude oil tankers. Therefore, these authors assume that cutting the time spent on the voyage would have a positive impact and might reduce the emissions significantly.

However, several authors disagree with these statements and provide different points of view. Khon et al. (2009) argue that the increased Arctic transportation will come at a price. The expected shipping volume in the future will inevitably affect the environmental footprint and the amount of aerosols and ozone-damaging substances is likely to grow. As a result of that, the surface ozone levels in the Arctic are expected to be similar to those of highly industrialized areas in the Northern Hemisphere. Zhu et al. (2018) point to the fact that the stark limiting physical-geographical conditions along the NSR require using smaller vessels which are able to transport lower loads only. Because of that, the environmental results per TEU¹¹ would not be good shall the NSR traffic become more intensive. Bekkers, Francois and Rojas-Romagosa (2018) confirmed this supposition in

¹¹ The unit used for measuring container capacity (twenty-foot unit). 1 TEU equals to the capacity of a twenty foot (6,1 meters long) container.

their study. The simulations they carried out reveal that the premise of the shorter NSR distance simply leading to a lower amount of emissions produced is wrong. Because of the potential to cut the journey length in half, more companies would be attracted and the traffic intensity would increase. As a result, the positive effect of shortening the distance would be balanced by the increased commercial interest. Furthermore, according to the authors' findings, the emissions would in fact increase slightly. As apparent, the environmental implications of increasing the NSR traffic are highly doubtful and questionable.

5. Economical aspects of the Northern Sea Route

5.1 Contemporary maritime transport

Nothing illustrates the importance of commercial shipping better than the fact that four-fifths of merchandise and commodities worldwide are transported by sea. Container shipping has been on the rise since the 1960s because it allows a rather quick and swift movement of all kinds of goods. Heavy bulks and cubic capacities can be transported at once while the merchants benefit from the principle of economics of scale. Containerized merchandise trade and shipping is consolidated especially in the Northern Hemisphere between Europe, North America and Asia. The latter mentioned has developed the status of the world's industrial core and its market started expanding rapidly during the 1980s and 1990s. The main Asian economies are sometimes also referred to as "2+6" - Japan and China plus the six quickly emerging markets: Philippines, Thailand, Indonesia, South Korea, Singapore and Malaysia. As a result of that, the naval communications connecting these countries with Europe and North America became of utter importance. And while these countries with China in the front adjusted quickly and modified their ports to meet the new demands, the same cannot be said about the European shipping infrastructure. As a result, congestion and naval traffic jams became a problem when approaching the Northern Range ports like Hamburg or Le Havre. And although their capacity improved a bit and some betterments have been made, the Suez Canal issue persists (Verny and Grigentin 2009, p. 109).

From the beginning of the previous century, the main established navigational corridors have remained practically unchanged. Since the opening of the Suez Canal in 1869 and the Panama Canal in 1914, the very same naval routes have been relied on. But the several decades of constant and steady growth of container shipping showed that there are certain limits to the current existing global transport infrastructure. Notably the "Royal Road" via the Suez Canal which represents a vital artery for the entire Euroasian market might be questioned on these grounds (Verny and Grigentin 2009, p. 107). In 2020 the Suez Canal has reported record numbers: as of June 17th 2020, 6 166 vessels transited the African-Asian waterway (Maritime Executive 2020). If this trend persists, by the middle of the 21st century, the capacity ceiling of either the Suez and Panama Canals might be reached (Khon et al. 2009, p. 765). As Bekkers, Francois and Rojas-Romagosa (2016) point out,

almost one tenth of all World trade is transported via the Suez Route. The same authors predict that, over time, about two-thirds of this freight tonnage will be transported through the NSR instead. Therefore, a certain form of readjustment to the current extent of traffic is inevitable in order to prevent a complete clogging of the Suez Canal. See the appendix no. 11 depicting some of the global contemporary commercial routes.

5.2 Royal Route alternatives

The Suez problem, however, cannot be simply dealt with by expanding the capacity and improving the facilities. Half of all the vessels transiting through it are container ships, and with the use of bigger and heavier ships, the waiting time and queues are only bound to increase. As a consequence of that, the Canal will not be usable as often and the companies will inevitably have to start looking for alternative connections and substitute communications instead.

The Trans-Siberian Railway might be among the most apparent alternatives. As a part of the Trans-Asian Railway project, as well as in order to present itself as a convenient transport and logistics territory, Russia has invested quite significantly into this railroad. Time efficiency is its major benefit; transporting goods from Shanghai to Hamburg takes estimateably eighteen to twenty days, whereas conducting the same journey by taking the so-called Royal Route via the Suez Canal is about ten days longer. Despite that advantage, this rail connection accounts for only about 1% of all the merchandise shift between Asia and Europe. To make this traffic junction more interesting for logistics and container companies, further betterments have to be made. The quantity of tracks as well as the number of regular lines must increase and the signal coverage along with the electrification should be improved, too. Last but not least, the rail track gauge needs to be adapted to the European standards¹². Another surrogate for the Suez Road is mixing more ways of transportation together, such as air and sea. When combining these two options, usually a naval communication is used for transferring the cargo from the Asian hubs to the ports in the Persian Gulf and then a plane takes over, typically via Dubai, and delivers the goods to Europe. Combination of these two transport methods together cuts time

¹² The prevailing rail gauge, found most notably in Europe, North America, Middle East or China, is 1435 milimeters. The countries of the former Soviet bloc, however, use the 1520 milimeters dimension.

significantly, allowing to make the whole journey between Shanghai and Frankfurt in just two weeks. Nevertheless, including the airliner into the itinerary eventually makes the whole connection quite costly compared to using maritime transport only (Valery and Grigentin 2009, p. 110).

Because of the problems relating to the Royal Route and its alternatives being far from perfect, more attention is being turned towards the NSR instead. The oncoming advancement in the Arctic shipping will be also caused by the exploration and exploitation of oil and gas areas in the Arctic Shelf. The consequent upsurge of navigation volume might decrease the need of icebreaker support, reduce the total sailing time and mitigate the related hazards, all of which may contribute to making the NSR more attractive compared to the other established mainstream naval corridors (Khon et al. 2009).

Another huge advantage of the NSR is related to the so-called geography of places. Over the years, Central and Eastern Europe have developed significantly and a similar economic shift is apparent in China, where the economic centers are moving from the Southeast to the North. With respect to this fact, connecting these areas by the NSR would only make sense (Verny and Grigentin 2009). See the appendix no. 12 depicting these economic centers of Europe and Asia. The NSR length measures from 2100 to 2900 nautical miles depending on the navigation conditions. As a result, it accounts for one of the quickest and shortest connections between Northern Europe and Northeast Asia (Liu and Kronbak 2010, p. 435). This results in saving estimately 10 days and 40% distance compared to the Royal Road. The same journey via the latter mentioned Suez Corridor takes about a month (Verny and Grigentin 2009, p. 111). As the appendix no. 13 suggests, transits from Northwest Europe to China, Japan, South Korea or Taiwan are significantly shorter along the NSR and the distance savings range from twenty to forty percent. In addition to that, there is one more advantage the NSR brings. Maritime piracy is a great risk the shipping companies have to take into account, especially when sailing through the Strait of Malacca or the Gulf of Aden, which are considered to be one of the modern piracy hotspots. Along the NSR, no such threat menaces the shipping companies (Zhu et al. 2018, Vuković, Mekhrenstev and Vuković 2018).

Even though the Suez Route currently presents a significantly cheaper option, both the NSR and the Trans-Siberian Railway are quite interesting alternatives worth considering (Verny and Grigentin 2009, p. 107). On the other hand, the connections like the Panama Canal, Northwest Passage or Cape of Good Hope are a hindrance and do not constitute an alternative option in terms of economical profitability and cost savings (Schøyen and Bråthen 2011, p. 982).

5.3 Infrastructural obstacles

Vast areas along the Russian Arctic shoreline between Murmansk and the Bering Strait are almost unsettled and unpopulated. As a result of that, the opportunities for possible stopovers are reduced significantly. This does not correspond with the model applied along the Suez Route, which profits from the well-established quality infrastructure of the port cities along the route. The transportation systems of the hinterlands are cooperating closely with the ports by using the rail transport or river estuaries for transshipping (Verny and Grigentin 2009, p. 111). Such models are not applicable in Russia. The major part of infrastructure along the NSR on the Russian Arctic shoreline is in very poor condition and calls for massive investments and modernization. The shipping facilities have remained virtually unchanged from the Soviet times and most ports on the NSR are capable of elementary vessel repairs only, otherwise the shipowners have to head east or west to get their ship either to Murmansk or Vladivostok. Large vessels might also encounter difficulties when approaching the wharfs and docks along the Route, the waters of which are often shallow and unadapted for their anchoring (Zhu et al. 2018, p. 457).

Vuković, Mekhrentsev and Vuković (2018) also emphasize the need of the Russian Arctic infrastructure development. These authors accent the Russian strategical potential and liken it to Dubai and Singapore, which have both transformed into the World's logistics and transshipment hubs. Investments in the Ob River region infrastructure, for example, might prove as very beneficial to the areas of Northern Ural and Siberia as well as to the Russian federal economy as a whole. The Yamal Peninsula ports, such as the Sabetta port, currently remain connected to the mainland only by a single rail leading through Vorkuta which proves as very limiting for supplying these Arctic ports with merchandise and commodities.

Numerous authors (Verny and Grigentin 2011, Lee and Kim 2015, Zhu et al. 2018) underline the importance of further Russian investments into its naval transportation facilities. As they note, the current unsatisfactory conditions have some other negative effects aside from the aforementioned ones. The weather conditions and navigational hazards, such as floating growlers and floes, mists and strong gusts of wind translate into one of the biggest NSR risks. Due to the poor infrastructure, however, the assistance the Russian Federation can offer is very limited. In case of an accident, the SAR operations might prove as highly problematic and in various segments along the Route, receiving urgent assistance within a short period of time is virtually impossible. Improving the facilities would also have a positive environmental effect because enlarging the ports, wharfs and docks would enable the entry of larger vessels able to carry higher loads (Zhu et al. 2018, p. 469).

5.4 Norwegian opportunity

Although the majority of literature and this thesis as well is focused on Russia as the main player regarding the NSR, some other concerned regions, especially Scandinavia, might be omitted and left behind. However, as Solvang et al. (2018) demonstrate, Scandinavia and Norway in particular may benefit from the possible NSR development, too. As Sweden and Finland are locked in geographically and do not have access to the Arctic seas and Denmark is rather far south, Norway has a unique advantage. Besides from the Russian Federation, United States and Canada, the three Arctic giants, Norway is also an important Arctic power. The NSR embraces its entire coastline along all of which Norway has a very strategic structure of ports¹³. Due to the Norwegian industry being specialised in fishing and extraction of oil, gas and natural resources, the ports are highly developed and modern, especially in comparison with the Russian Arctic infrastructure. Furthermore, the Norwegian ports are ice-free all year long, offer free capacities and have enough space for potential expansion. Last but not least, about 80% of all Arctic shipping takes place in the Norwegian waters. As a result of that, the Norwegian harbors have very good connections with the ports in North and Northwest Europe. The oil resources will not last for ever and utilizing the NSR might provide opportunities for the industry

¹³ Notice the appendix no. 14 displaying the numerous harbors spaced out equally and regularly along the entire Norwegian coastline.

workers once the gas and minerals start running out. The greater Norwegian involvement in the NSR would, however, boost the Scandinavian economy as a whole since all Sweden, Denmark and Finland are important trade partners for Norway due to the geographical proximity (Solvang et al. 2018).

5.5 Global NSR macroeconomic implications

Obviously, further development of the NSR and the increase in traffic volume would affect not only the Arctic countries but rather the global economy as a whole. The economies of the European Union (EU) and East Asia might be impacted the most. Interestingly, within the EU, not only the Northwest Europe with countries like Netherlands, United Kingdom, Belgium or Germany, but the Central Europe too would be among those to benefit the most. In fact, the Czech and Polish exports to East Asia might grow by some fourteen and twelve percent, respectively, which would be the highest increase in the EU. Furthermore, the Czech gross domestic product (GDP) and welfare per capita would experience the second highest growth right after Belgium. Additionally, the trade flows from China, Japan and South Korea to the EU would surge as well. On the contrary, the increased NSR traffic would have a negative impact on the Southern Europe. Unsurprisingly, the countries on the Mediterranean coast like Italy, Greece, Spain or Turkey profit from the Suez Road and therefore, recasting a significant portion of the cargo flows to the north instead might prove as economically harmful for these states. Furthermore, the future NSR expansion would put a significant pressure on countries like Egypt or Singapore, both important global transportation hubs along the Suez Route (Bekkers, Francois and Rojas-Romagosa 2018). For the detailed estimated impact the NSR would have on the GDP and welfare per capita, see the appendix no. 15.

5.6 Economic profitability of the NSR

As Lasserre and Pelletier (2011) mention, a somewhat general assumption that the Arctic traffic is about to experience a massive boom in the upcoming years is presented by the media and some scientists and researchers as well. However, if the NSR is to become one of the leading naval communications, it also has to be economically profitable. In fact, this criterion is probably more relevant than any other aspect of the Route. The legal problems and regulation, as well as the technical issues, can somehow be dealt with. However, until the Route conclusively proves itself as advantageous in terms of costs and

earnings, the companies will not even consider it as an alternative passage. Most of the Arctic shipping boom predictions are simply based on the aforementioned hypothesis that the shorter route automatically indicates cost savings.

But, as Liu and Kronbak (2009) remark, the 40% decrease in distance does not necessarily correspond with saving the same portion of company's financial resources, mainly because of the pricey ice-classed ships, lower pace or icebreaker services. According to Solvang et al. (2018), the cost premium for the ice class ships ranges in between twenty to forty percent compared to the regular vessels. Also, a certain amount of damage to the vessels caused by ice and the consequent need for repairs after transiting the Route are highly likely. The aforementioned Russian tariffs and the insurance issues are yet another limiting factors. The biggest and the most spacious container ships cannot enter the Route's corridors, thus the economy of scale principles will not apply.

Lassere and Pelletier (2011) and also later Lassere alone (2014) have conducted the NSR profitability case studies and compiled the results of other analyses, too. Both authors point to the controversial and questionable conclusions of the case studies dealing with the NSR profitability in comparison with the Suez Route. Most of the research labeled the NSR as a feasible naval communication but very marginal in profitability with estimates to become competitive in the forthcoming decades. Some authors, however, doubted the profitability and assume the Route might prove as favorable only under the condition the fuel prices are very high and the ice levels continue receding significantly. Few studies even perceive the NSR as unprofitable as of now. Recently, Zhu et al. (2018) have confirmed the previous conclusions formulated by Lassere (2014) and before in cooperation with Pelletier (2011) that no unanimity and conformity exists in terms of the NSR economical viability. Additionally, the researchers stressed the fact that even the newer studies are based on various assumptions and do not consider all the important factors.

5.7 Shipping companies' perspective

The different conclusions of the NSR case studies lead us to the fact the whole NSR issue shall be approached rather carefully and in a more sober-minded way. Besides that, the shipowners' intentions regarding the Arctic are often neglected, yet they can also tell us a

lot about the future of the polar shipping. In an interesting study, 98 shipping companies from Asia, Europe and North America, focused on transporting either containers, bulk or general cargo, were asked if they are considering the expansion of their commercial activities to the Arctic in the future. While seventeen companies answered "yes" and ten "maybe", seventy-one corporations said resolute no to extending their business to the World northernmost seas. These findings are thus in a sharp contrast with the otherwise prevailing notion the Arctic Ocean is about to experience a boom in shipping and the statements that the NSR will become the new Suez or Panama of the 21st century (Lassere and Pelletier 2011, p. 1472). Zhang, Meng and Zhang (2016) later confirmed this. Even though the media perceive the NSR as a sensation and the researches are attempting to prove the feasibility of the Route, the shipping industry approach is much more hesitant and neglects the Arctic.

5.8 Cargo type

When discussing the economical profitability and viability of the Route, the type of cargo and the kind of vessel are also important aspects to consider. As various authors (Lasserre 2014, Solvang et al. 2018, Zhang, Meng and Zhang 2018) agree, due to the lacking guarantees, such as the SAR services, ship repairs and replacement vessels, the NSR is not too eligible for liner shipping companies and container transport. Regular lines have to operate on an established timetable, but precise schedule and reliability are far from attainable under the current conditions (Schøyen and Bråthen 2011). Delays caused by the different sorts of NSR obstacles would later lead to financial penalties and company's reputation damage (Solvang et al. 2018, p. 499). Lasserre (2014) further argues that even the summer transits are not profitable for liner services until the vessels are allowed to carry bigger loads and the fuel prices increase significantly.

On the other hand, for some other types of vessels and cargo, the NSR might be quite attractive. While for certain summer operations the NSR might be already profitable for the costs per weight prove as favorable (Schøyen and Bråthen 2011, p. 977), the Route can turn out remunerative even during the winter months in the off-season (Khon et al. 2009, p. 766). Bulk shipping and the transportation of raw materials and liquids, as well as the conveyance of very heavy loads, can be carried out via the NSR quite seamlessly

as time and speed are not that important factors for these types of freight (Schøyen and Bråthen 2011, Verny and Grigentin 2009).

Shibasaki et al. (2018) consider the NSR particularly advantageous for liquefied natural gas (LNG) shipping. The Yamal LNG plant in Sabetta, an ambitious project launched in 2013 and operating from 2017, is a major cause to that. The NSR turns out as the cheapest option for transporting the LNG from Norway and Russia to East and Southeast Asia. Furthermore, countries like Germany, Netherlands and Belgium can profit from the NSR in various scenarios, too. Under the assumption the conditions are good, utilizing the NSR can be profitable even for shipments headed from France and Spain to Japan and China or vice versa. But regardless of the cargo type, the official Russian tariffs tend to make every journey more costly (Lasserre 2014, p. 159) and the USD-RUB exchange rate is closely linked to it. Obviously, the currency is yet another key factor that affects the shipping companies' decisions about the Route (Shibasaki et al. 2018).

6. Conclusion

Over the several centuries and throughout the years, the NSR has progressed quite significantly. From the initial exploratory expeditions into the unknown and the first successful voyages and completed passages, over the increasing strategical and geopolitical importance during the 20th century towards opening the Route to the World as a result of the international political changes, the NSR has undergone a notable development. As of now, this naval communication has some unexceptionable benefits and advantages that make it look quite impressive and compelling in comparison with many other global commercial transport connections.

The distance and time savings are probably the most obvious and noticeable benefits of this Arctic route. The potential to cut the voyage length by up to forty percent and save more than a week of time is absolutely crucial and it puts the NSR to a better position than some of its alternatives, such as the Panama route, the Cape of Good Hope route or the Northwest Passage. As shown, the Arctic ice levels are likely to continue melting rapidly and thus, the length of the NSR navigation season and the number of ice-free days will increase. The Royal Route leading through the Suez Canal has reported record numbers in 2020 and renewed the debates about the capacity of the waterway once again. According to the estimates, it might reach its maximum capacity together with the Panama Canal in three decades, hence the NSR would provide at least a partial relief to these overused commercial lines. Furthermore, no congestions would be impending in the Arctic. Considering the extreme weather conditions in the Arctic, maritime piracy would probably not be a hazard along the Route either. Nevertheless, several problematic issues arise. By thorough analysis of the distinct aspects in this thesis, I attempted to cover at least some of them. On the following lines, I will try to answer the three main research questions raised in the very beginning, concerning the different facets of this Arctic sea lane.

6.1 How do the US-Russian territorial disputes and the Russian domestic legislation affect the NSR?

The legal issues, both domestic and international, are among the most problematic aspects of the Route. The NSRA administrative burden and the complicated Russian legal regulation constitute a major setback for many otherwise interested subjects. Passage

through the widely discussed Suez Canal is incomparably easier in terms of regulation. After all, it is enough to book the transit four days in advance and then notify the Suez Canal Port Offices 48 hours before the ship arrives. On the contrary, obtaining enough information about the NSR is a difficult task and thus, unless the Russian Federation simplifies the whole procedure of applying for the transit, the maritime companies are likely to choose a different route instead. Furthermore, the domestic legislation is considered discriminatory to foreign vessels and in conflict with international law by several shipping organisations. Besides, the NSR navigation and safety standards established and enforced by the Russian Federation were not approved preliminarily by the IMO. And even though the Russian domestic legislation is objectionable and dubious, the international legal territorial disputes have the potential to cause some real problems. Thus, their worsening might have far reaching consequences.

Even though it might seem that Russia and its political representatives are willing to cooperate on international level, such as within the Arctic Council, these actions are rather symbolic. The United States are likely to persist and keep objecting henceforward, and further disputes with Canada and Denmark, regarding the Arctic Shelves, are at risk. Moreover, several prominent Russian scientists and politicians perceive the international law as a threat to their homeland, stating that joint action and global cooperation within the international community would take away the strategical Arctic territories of Russia. The global warming and the melting ice will make the NSR more accessible for foreign vessels without Russian assistance and approval. Thus, conflicts and litigations are prone to occur. Despite the fact that no country has joined the US-Russia territorial dispute so far, we can presume that it is in the best interest of the foreign shipping companies to sail through the straits labeled as international where freedom of navigation applies. As a result, some notable actors interested in utilizing the Route, such as the European Union, might support the US argumentation in the future. On top of that, the American legal reasoning to consider the numerous NSR straits international will get more and more relevant with the expected surge of foreign vessel transits. To conclude, if Russia wants to attract more foreign companies and multiply the NSR traffic volumes, its representatives have to balance these efforts with their strategic interests in the north. Reaching an international agreement about the legal regime of the disputed areas is hence

important not only for the NSR development but to retain peace in the Arctic and to avert the political tensions from growing.

6.2 What would be the economical implications of increasing the NSR traffic volume?

The possible future advancements along the NSR might have some positive economical effects. Obviously, Russia would benefit from the increased Arctic shipping volumes the most. Its treasury could receive bold financial amounts for the administrative fees and icebreaker services as well as from the foreign companies using the Russian ports and shipping infrastructure. Besides, Scandinavia and especially Norway, due to its geographical position and well-established structure of harbors along the coast, might profit from the NSR significantly, too. Given the direct access to the sea and notable international ports, states in Northwest Europe, such as Netherlands, Belgium, Germany or the UK, may find the NSR particularly appealing. The Asian exports to Europe, most notably from China, Japan, Taiwan and South Korea, would surge as well. Interestingly, Czech republic and Poland can benefit from the improved connection with Asia distinctly thanks to their strategic position in the geographical center of Europe. For Russia, further NSR advancements would also strengthen its geopolitical position in the World. The whole Route is under the exclusive jurisdiction and complete control of the Russian Federation and transiting through is virtually impossible without the country's permission and various forms of assistance and guidance provided by the state-controlled bodies and agencies. If the traffic volume increases, Russia will be in control of a busy strategic traffic Artery connecting Europe with Asia. Facing competition from several emerging economies and dealing with various domestic policy issues, the political representatives of Russia would certainly appreciate the opportunity to divert attention from their problems and boost the national economy. On a global scale, transforming the NSR into a regular and established naval corridor would undoubtedly have an economical impact on the countries along the Suez Route. By transferring a part of the trade flows to the north instead, the states along the Mediterranean coast, as well as Egypt, the Gulf countries and Southeast Asia, would probably experience a slight economic downturn. Nevertheless, the contemporary mainstream corridors are nearing their capacity limits and still, the traffic activity along the Royal Route would be likely to remain very high because of the strategic trace connecting three continents and numerous global hubs. Furthermore,

opening the NSR to international commerce in greater extent would create more competition in maritime transport. In summary, shifting a certain portion of freight loads to be transported along the NSR instead would presumably turn out positive as the economical benefits persuasively outweigh the negatives. Besides from Russia, enhancing the NSR connection may turn out appealing for both the EU and Asian countries.

6.3 What are the major obstacles and barriers hindering the possible NSR development?

Despite the manifold conveniences and benefits, there are numerous impediments of various kinds to be dealt with in order to make the Route more viable. Apart from the aforementioned legal issues, several more inconveniences stand in the way. The considerably outdated Russian infrastructure is one of the major problems. If the NSR transits are to become regular, the shipping companies need to be provided with several guarantees and assurances. The search and rescue services as well as the facilities to harbor safely and have the ship repaired need to get better. The reaction time in case of environmental emergency, oil spills and iceberg collisions has to improve significantly in order to prevent irretrievable and acute damage to the unique Arctic marine ecosystem. As foreseen, the forthcoming development of the Arctic is going to be related to mining and resources extraction. Considering its vast lands and territory, the Russian Federation has notable resources of industrial minerals and metals and furthermore, it is the country with the biggest proven reserves of natural gas and its oil reserves are eighth highest in the World. The future extraction of these raw materials might go hand in hand with the infrastructural development of the Siberian areas and improve the connection structure with the NSR. Such investments are, however, extremely expensive and Russia does not have the sufficient means to modernize the Arctic facilities on its own. Therefore, attracting foreign investors might be inevitable to secure the future NSR feasibility.

Moreover, enhancing the Arctic infrastructure may prove as favorable even for the environment. Under the status quo, the environmental impact of intensifying the NSR traffic volume would actually prove slightly negative since the amount of traffic would outweigh the positive effects of shorter distance and reduced time. The current conditions and shipping facilities' parameters only enable smaller ships to enter the NSR corridor,

meaning the load factor is rather low and the costs and environmental outcomes per weight are high. If the facilities improved and the wharfs and docks enlarged, bigger vessels might enter the corridors and transit the Route. The load factor would improve, container shipping might prove as cost-effective due to the possibility to carry heavier loads and the environmental impact would certainly be more frugal.

The financial viability of the Route is controversial, too. According to various case studies, the economical profitability of transiting the NSR is marginal under the current conditions. Some researchers even consider this communication to be lossy. There are several extra costs and expenditures that come up with the NSR passage, such as the pricey tariffs for icebreaker services and the need of using ice-invigorated vessels. Calculating the arctic hazards is quite intricate, therefore negotiating a special insurance arrangement is difficult and expensive. Regardless of the technological progress and modernization of ships and navigational systems, the physical-geographical conditions and climatic hazards still remain very challenging. Despite the perceptible ice melting, the NSR still remains a seasonal communication and as a result of that, the traffic is very low and the advancements are lingering.

6.4 Communication for the 21st century?

Even though the Russian authorities claimed in 2015 the shipment extent and traffic volumes are going to increase twenty times by 2030, the actual progression will probably be much slower. Considering all of the aforementioned barriers and obstacles together with the speed of development, it is very unlikely that the NSR will become the new leading maritime communication and replace the current established sea lanes. Even if Russia acquired enough finances and managed to attract foreign investors to improve the Arctic infrastructure, such projects are time consuming.

However, the navigational conditions are likely to get better with time because of the melting ice. Furthermore, most of the NSR problems and issues can be dealt with. As suggested earlier, the Route may provide a well-needed relief to other sea lanes and chokepoints. For the innovative companies willing to take the risk, the NSR might be an interesting opportunity to gain advantage for the future as well as to strengthen their market position. As most authors agree, this Arctic sea lane will become price-

competitive and profitable in the next decades. According to some predictions, the future development in the Arctic and the fight over the control of the NSR might even lead to a recommencement of the Cold War and cause an armed conflict. While such scenario is rather improbable, it underlines the significance of the Route and the whole region. Therefore, even though the NSR is quite unlikely to turn into a maritime polar highway, it has the potential to become a very important traffic artery and in the upcoming years, we might witness its strategic significance growing rapidly.

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Teze závěrečné diplomové práce

Katedra politologie IPS FSV UK

Příjmení, jméno: Jan Kregl

Název práce: Northern Sea Route - communication for the 21st Century?

Vedoucí práce: PhDr. Michael Romancov, Ph.D.

Název práce v AJ:

Studijní obor: Politologie a mezinárodní vztahy (Bc.)

Semestr zadání: letní

Ak. rok podání: 2018/2019

Předpokládaný termín dokončení: LS 2020

Typ práce: bakalářská

Zdůvodnění výběru práce (max 2000 znaků):

Vzhledem k souběžnému studiu Politologie a mezinárodních vztahů a Právnické fakulty Univerzity Karlovy, považuji téma Severní mořské cesty za zajímavý průsečík obou těchto oborů. Problematika této námořní komunikace, poťazmo oblasti Arktidy jako celku, je velmi různorodá a lze ji uchopit z mnoha úhlů. V první řadě se jedná o téma politické, kdy rozhodující slovo má sice Ruská federace, zájem o tuto oblast a její možné využití jeví ale i další významní aktéři světové politiky. Jistě tedy bude příhodné srovnání, jak k této otázce přistupují jednotlivé státy v rámci jejich zahraniční politiky. Rovněž se tomuto tématu v médiích, ať už tuzemských či zahraničních, dostává jen minimum pozornosti. A pokud už se přece jen do hledáčku médií dostane, je pojato jen velmi okrajově a stručně bez potřebného kontextu - právě ten bych chtěl v této bakalářské práci lépe rozvinout. V porovnání s jinými tématy politologie, mezinárodních vztahů a geopolitiky, jako jsou například válečné konflikty, extremismus či soupeření globálních velmocí, existuje k této problematice výrazně menší spektrum zdrojů informací. Podle dostupných statistik se zájem o tuto námořní trasu každým rokem zvyšuje o několik procent. Detailní rozbor všech specifik, která se s trasou pojí, bude tedy nepochybně velmi zajímavý, stejně jako predikce možného budoucího vývoje. Téma zaslouží pozornost také z pohledu mezinárodního práva veřejného. V oblasti se nachází několik sporných území, na které si činí nároky více států. Důležitou roli hraje také specifická část mezinárodního práva veřejného - mořské právo a sním spojená specifika výlučné ekonomické zóny. Stále častěji je v poslední době diskutována také otázka klimatické změny a globálního oteplování, které je v oblasti Severního ledového oceánu patrně snad ještě víc než jinde ve světě. Úbytek ledových masivů je zde zcela evidentní a alarmující. Jakkoliv negativní jsou důsledky tohoto světového fenoménu, pro mořeplavbu v této oblasti však může představovat i novou příležitost

Předpokládaný cíl (max 1500 znaků):

Cílem práce bude primárně poukázat na klady a záporny plavby touto námořní trasou a analyzovat její specifika. Bude zhodnocen vývoj, kterým trasa zejména v posledních letech prošla, a pokusím se rovněž predikovat budoucí možný scénář a možnosti, které trasa nabízí. Z dostupných zdrojů a dat bych rovněž rád zjistil, zda-li může trasa představovat alternativu pro hojně využívané a přetížené dopravní námořní cesty. Pozornost bude také věnována námořní flotile a zejména ledoborcům, kterými jednotlivé státy disponují. Rád bych také zjistil, jakým způsobem globální oteplování a klimatická změna ovlivňují trasu a tent geografický region - ať už pozitivně či negativně.

Metodologie práce (max 1500 znaků):

Vzhledem ke snaze dané téma uchopit a popsat z několika úhlů, budou využity jako zdroj informací zejména research papery či vědecké články z periodik a sborníků z oblasti politologie, práva, geografie, ale rovněž i technických oborů. Čerpat informace budu samozřejmě také z monografií, které se problematiky dotýkají, ale rovněž i obecných publikací v oboru geopolitiky. Jako zdroj nejaktuálnějších informací o vývoji v posledních letech poslouží rovněž také články a komentáře z českých i světových médií.

Práce bude rozdělena do několika kapitol za účelem přehlednosti a srozumitelnosti. Zároveň bude postupováno tak, aby si čtenář udělal o tématu lepší představu a systematicky porozuměl dané problematice. Předpokládané členění na jednotlivé kapitoly je zmíněno níže.

Z hlediska metodologického bude pravděpodobně nejvhodnější metoda případové studie, zejména kombinace exploratorní a deskriptivní případové studie. Vhodné budou nepochybně rovněž i prvky komparativního přístupu, například při srovnání Severní mořské cesty s dalšími námořními trasami. Je však možné, že během procesu tvorby práce se ukáže jiná metoda jako vhodnější.

Základní charakteristika tématu (max 1500 znaků):

Severní mořská cesta představuje velmi zajímavou alternativu pro námořní dopravu mezi Evropou a Asií. Jejím bezpochyby největším pozitivem je výrazně kratší vzdálenost a tím pádem i nižší náklady. Trasa z Japonska do Norska může být až o 40% kratší než při využití "běžné" trasy, tedy přes Suezský průplav. Ten je při dnešním obrovském objemu námořní dopravy přetížený a plavbou přes Severní ledový oceán by se tak tlak na něj alespoň částečně snížil.

Komplikaci však představují extrémní přírodní a klimatické podmínky. Led v některých úsecích roztaje na pouhý jeden až dva měsíce v roce, doprovod ledoborce je tedy pro každé plavidlo nutností. Nutnost ledoborce ovšem nepředstavuje pouze vyšší finanční náklady, ale i omezení nákladního plavidla, které ho následuje. Stopa, kterou je schopen prorazit, není dostatečně široká pro běžné nákladní lodě, které proplouvají již zmíněným Suezským průplavem a je tedy nutno použít plavidla menších rozměrů.

Celá trasa však leží ve výlučné ekonomické zóně Ruské federace, která má tak ve všech rozhodujících otázkách regulace rozhodující slovo. Zájem o plavení se v této oblasti projevují však i další hráči na poli globální politiky, například Čína nebo Evropská unie. I tak ale objem přepraveného zboží s každým rokem o několik procent roste, je tedy patrné, že logistické i energetické společnosti jsou si vědomy potenciálu, který Severní mořská cesta skrývá. Ruku v ruce se zpřístupněním a rozvojem cesty jde také těžba v arktických oblastech, neboť rychle rostoucí asijské země se potýkají s nedostatkem nerostných surovin.

Předpokládaná struktura práce (max 1400 znaků):

Úvod

Historie severní cesty cesty a geografického regionu

Současný stav

Fyzickogeografické podmínky a vliv klimatické změny

Právní režim a sporná území

Ekonomické aspekty trasy

Strategický potenciál a možnosti budoucího využití

Závěr

Základní literatura (10 nejdůležitějších titulů):

Shipping in Arctic Waters: A comparison of the Northeast, Northwest and Trans Polar Passages

The Northern Sea Route: A Comprehensive Analysis

LEE, Taedong a Hyun jung KIM. Barriers of voyaging on the Northern Sea Route: A perspective from shipping Companies. *Marine Policy* [online]. 2015, 62, 264-270 [cit. 2019-04-01]. DOI: 10.1016/j.marpol.2015.09.006. ISSN 0308597X.

ZHANG, Yiru, Qiang MENG a Liye ZHANG. Is the Northern Sea Route attractive to shipping companies? Some insights from recent ship traffic data. *Marine Policy* [online]. 2016, 73, 53-60 [cit. 2019-04-01]. DOI: 10.1016/j.marpol.2016.07.030. ISSN 0308597X.

VUKOVIĆ, Natalia a., Andrey v. MEKHRENTSEV a Darko b. VUKOVIĆ. TRANSNATIONAL TRANSPORT CORRIDOR OF THE NORTHERN SEA ROUTE BASED ON SABETTA SEAPORT: CHALLENGES OF REGIONAL DEVELOPMENT FOR RUSSIA. *Journal of the Geographical Institute 'Jovan Cvijic' SASA* [online]. 2018, 68(3), 405-414 [cit. 2019-04-01]. DOI: 10.2298/IJGI180613005V. ISSN 03507599.

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Teze odevzdány dne: _____

_____ **podpis studenta/-ky**

Schváleno vedoucím práce dne: _____

Schváleno garantkou/koordinátorem oboru dne: _____

_____ **podpis vedoucího práce**_____ **podpis garantky / koordinátora oboru**

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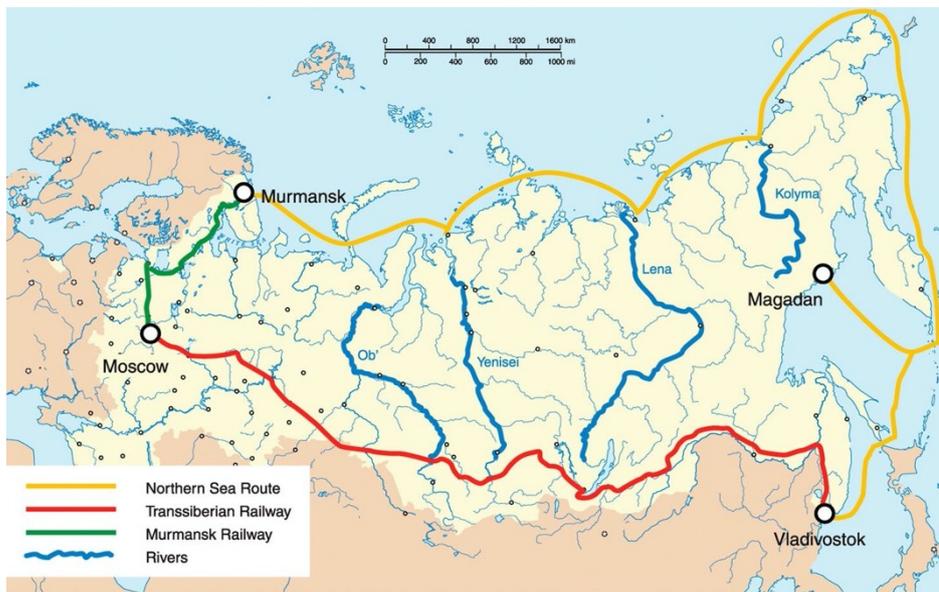
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Appendix no. 1: Julius von Payer's painting "Kaiser Franz Joseph Land, the abandoned Tegetthoff" (picture)



(source: <https://www.habsburger.net/en/locations/franz-josef-land#o-6829>)

Appendix no. 2: Parallel transportation structures of the NSR and the Transsiberian Railway (map)



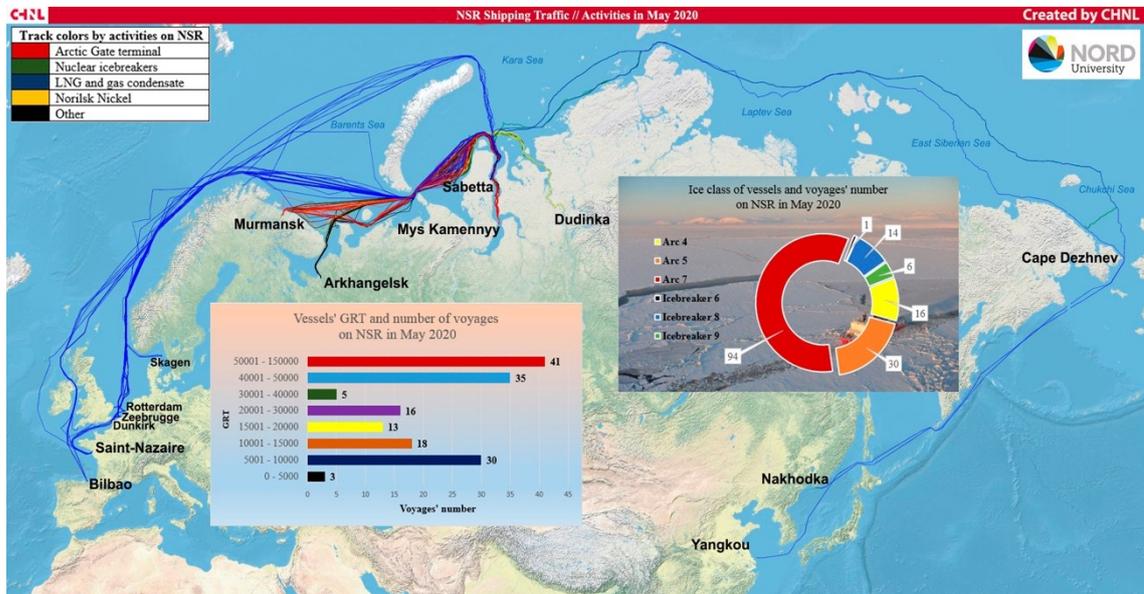
(source: Vakhtin 2019, p. 54, drawing by Alexander Khodot)

Appendix no. 3: Detailed statistics of the NSR transits in 2018 (table)

	Vessel					Departure			NSR				Arrival			
	Vessel name	Iceclass	Flag	Owner	Vessel type	GRT	Country	Port	Date	Point of entry	Entry	Point of exit	Exit	Country	Port	Date
1	Tian Hui	Arc 4	China	COSCO	General cargo	26787	Germany	Emden	05.07.18	C.Zhelaniya	24.07.18	C.Dezhnev	03.08.18	Japan	Tomakomai	12.08.18
2	Tian You	Arc 4	China	COSCO	General cargo	26787	S Korea	Busan	20.07.18	C.Dezhnev	28.07.18	C.Zhelaniya	11.08.18	Sweden	Harnosand	20.08.18
3	Tian Jian	Ice 1	China	COSCO	Heavy Load	26770	Denmark	Skagen	30.07.18	C.Zhelaniya	05.08.18	C.Dezhnev	19.08.18	China	Qingdao	02.09.18
4	Atlantic Winter	Arc 4	Portugal	Atlantic Winter	General cargo	15549	China	Taicang	30.07.18	C.Dezhnev	08.08.18	C.Zhelaniya	16.08.18	Sweden	Harnosand	31.08.18
5	Kairos	No	Russia	Morskoy Standard	Tanker	27526	Russia	P.Kamchatskiy	08.08.18	C.Dezhnev	11.08.18	Kara Gate	23.08.18	Russia	Murmansk	29.08.18
6	Tian En	Arc 4	China	COSCO	General cargo	26787	S Korea	Busan	07.08.18	C.Dezhnev	16.08.18	C.Zhelaniya	28.08.18	France	Rouen	05.09.18
7	Progress	Arc 4	Russia	yuzhmorrflyot	Reefer	4295	Russia	Anadyr	16.08.18	C.Dezhnev	17.08.18	Kara Gate	26.08.18	Russia	Arkhangelsk	28.08.18
8	Progress	Arc 4	Russia	yuzhmorrflyot	Reefer	4295	Russia	Arkhangelsk	01.09.18	Kara Gate	03.09.18	C.Dezhnev	11.09.18	Russia	P.Kamchatskiy	17.09.18
9	Tian Qi	Ice 1	China	COSCO	General cargo	26770	Finland	Kotka	17.08.18	C.Zhelaniya	26.08.18	C.Dezhnev	07.09.18	China	Qingdao	21.09.18
10	Argo	Ice 2	Russia	Neva-Charter	Tug	467	Russia	Murmansk	20.08.18	Kara Gate	25.08.18	C.Dezhnev	11.09.18	Russia	P.Kamchatskiy	21.09.18
11	Venta Maersk	Arc 4	Denmark	Maersk Line AS	Container	34882	S Korea	Busan	28.08.18	C.Dezhnev	06.09.18	C.Zhelaniya	14.09.18	Germany	Bremerhaven	22.09.18
12	Haaga	Arc 4	Portugal	ESL Shipping	General cargo	19955	Japan	Sakaide	02.09.18	C.Dezhnev	13.09.18	C.Zhelaniya	20.09.18	Sweden	Oxelosund	02.10.18
13	Tian Lu	Ice 1	Hong Kong	COSCO	General cargo	38122	Hong Kong	Hong Kong	03.09.18	C.Dezhnev	15.09.18	C.Zhelaniya	22.09.18	UK	Kingston	30.09.18
14	Jupiter	Ice 1	Russia	Antey	Fishing	1201	Russia	Arkhangelsk	14.09.18	C.Zhelaniya	17.09.18	C.Dezhnev	26.09.18	Russia	P.Kamchatskiy	01.10.18
15	Biglift Barentsz	Arc 4	Netherlands	BigLift Shipping	Heavy Load	23134	S Korea	Yosu	16.09.18	C.Dezhnev	26.09.18	C.Zhelaniya	04.10.18	Netherlands	Rotterdam	14.10.18
16	Viikki	Arc 4	Finland	ESL Shipping	General cargo	19955	Japan	Sakaide	25.09.18	C.Dezhnev	08.10.18	C.Zhelaniya	16.10.18	Norway	Hammerfest	19.10.18
17	Tasmanic Winter	Arc 4	Liberia	Tasmanic Winter	Heavy Load	15549	China	Jiangsu	30.09.18	C.Dezhnev	12.10.18	Kara Gate	21.10.18	Netherlands	Rotterdam	28.10.18
18	DS Marmadura	Arc 4	Antigua	DS Multibulk Gmbh	General cargo	10508	Russia	P.Kamchatskiy	10.10.18	C.Dezhnev	14.10.18	Kara Gate	24.10.18	Russia	Murmansk	26.10.18
19	Nordic Olympic	Arc 4	Panama	Bulk Nordic Olympic	Bulk	41071	Canada	Nunavut	09.10.18	C.Zhelaniya	24.10.18	C.Dezhnev	02.11.18	Russia	Nakhodka	13.11.18
20	Azure Coast	Ice 1	Saint Kitts	ROBERVAL IMPEX S.A	Pallet	2731	Island	Reykjavik	13.10.18	C.Zhelaniya	22.10.18	C.Dezhnev	31.10.18	Japan	Ishinomaki	14.11.18
21	Lomonosov Prospect	Ice 3	Liberia	Purposeful Corp.	Tanker	64909	S Korea	Yosu	11.10.18	C.Dezhnev	23.10.18	C.Zhelaniya	30.10.18	Netherlands	Rotterdam	10.11.18
22	Nordic Oshima	Arc 4	Panama	Bulk Nordic Olympic	Bulk	41071	Canada	Nunavut	15.10.18	C.Zhelaniya	30.10.18	C.Dezhnev	08.11.18	Russia	Nakhodka	18.11.18
23	Tian Hui	Arc 4	China	COSCO	General cargo	26787	China	Jiangsu	20.09.18	C.Dezhnev	30.09.18	C.Zhelaniya	06.10.18	Sweden	Oskarshamn	15.10.18
24	Egvekinot	Arc 4	Russia	Oil-Compact	Tanker	4110	Russia	Arkhangelsk	05.09.18	Kara Gate	08.09.18	C.Dezhnev	19.09.18	Russia	Provideniya	20.09.18
25	Tian You	Arc 4	China	COSCO	General cargo	26787	Norway	Hviefjorden	28.09.18	C.Zhelaniya	04.10.18	C.Dezhnev	11.10.18	China	Nansha	25.10.18
26	Argo	Ice 2	Russia	Neva-Charter	Tug	467	Russia	P.Kamchatskiy	24.09.18	C.Dezhnev	02.10.18	Yug.Shar	15.10.18	Russia	Arkhangelsk	19.10.18
27	Novorossiysk	ib 6	Russia	Rosmorport	Icebreaker	13867	Russia	Murmansk	22.11.18	Kara Gate	24.11.18	C.Dezhnev	03.12.18	Russia	Vanino	17.12.18

(source: https://arctic-lio.com/wp-content/uploads/2019/02/Transits_2018.pdf)

Appendix no. 4: Traffic activity on the NSR in May 2020 (map)



(source: <https://arctic-lio.com/nsr-shipping-traffic-activities-in-may-2020/>)

Appendix no. 5: Russian Arctic baseline claims and the waters contested by the US (map)



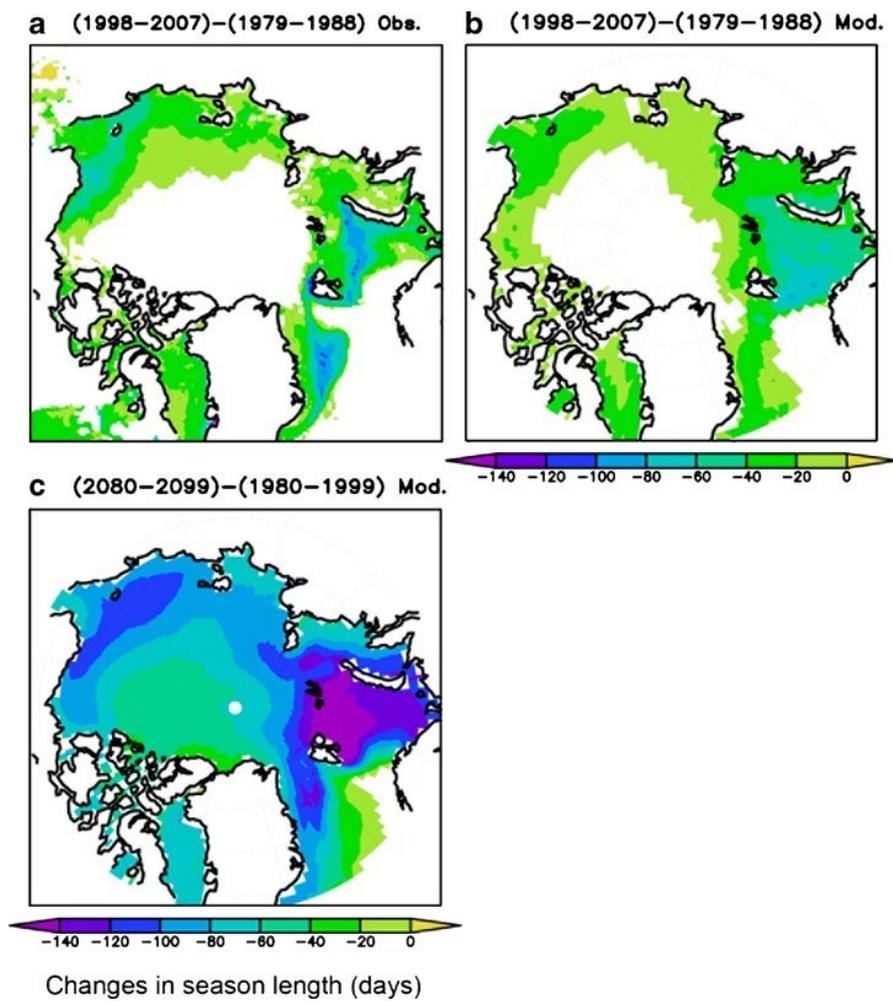
(source: Todorov 2017, p. 70)

Appendix no. 6: Average percentage of frozen areas during the summer navigation season (table)

Region	% of area	Average min date
Barents Sea	10	15.9
Kara Sea West	25	24.9
Kara Sea East	48	14.9
Laptev Sea	47	17.9
East Siberian Sea	57	13.9
Chukchi Sea	20	12.9

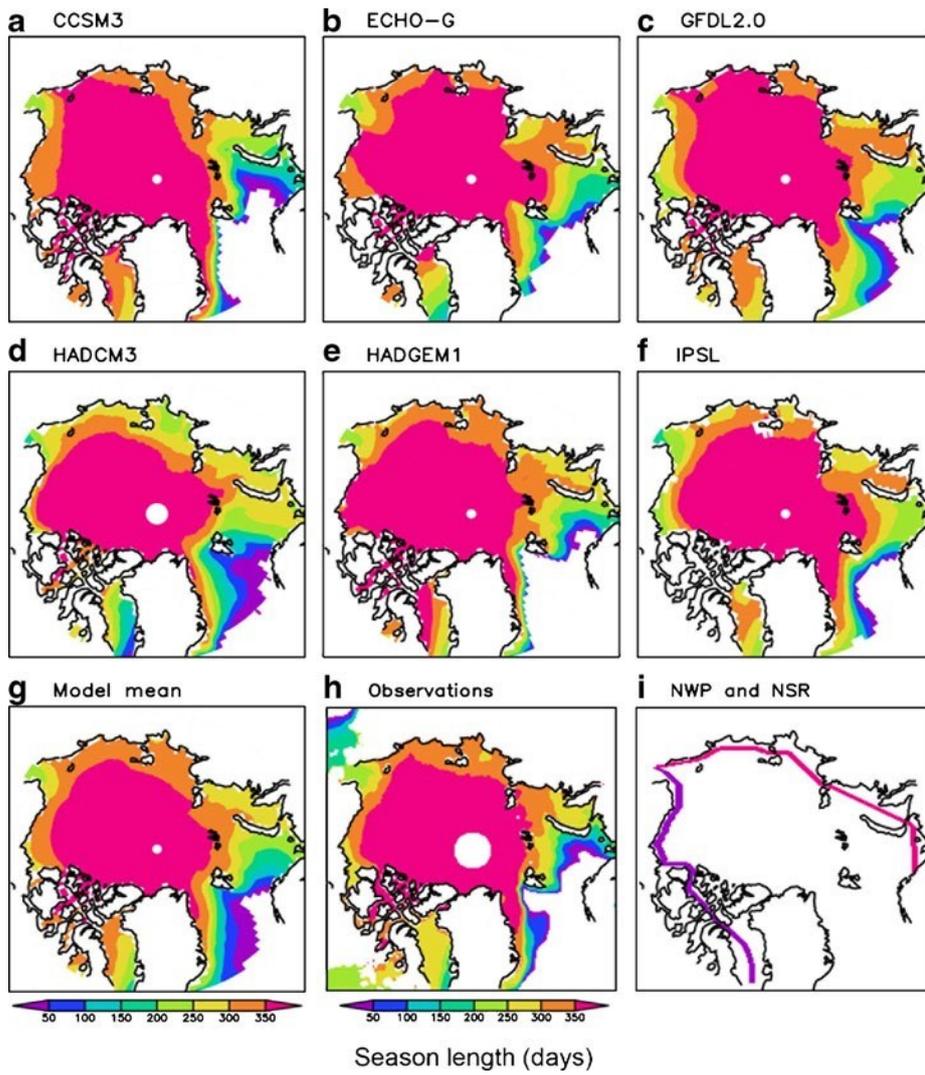
(source: Liu and Kronbak 2010, p. 438)

Appendix no. 7: Ice cover changes between 1979-1988 and 1998-2007 (maps)



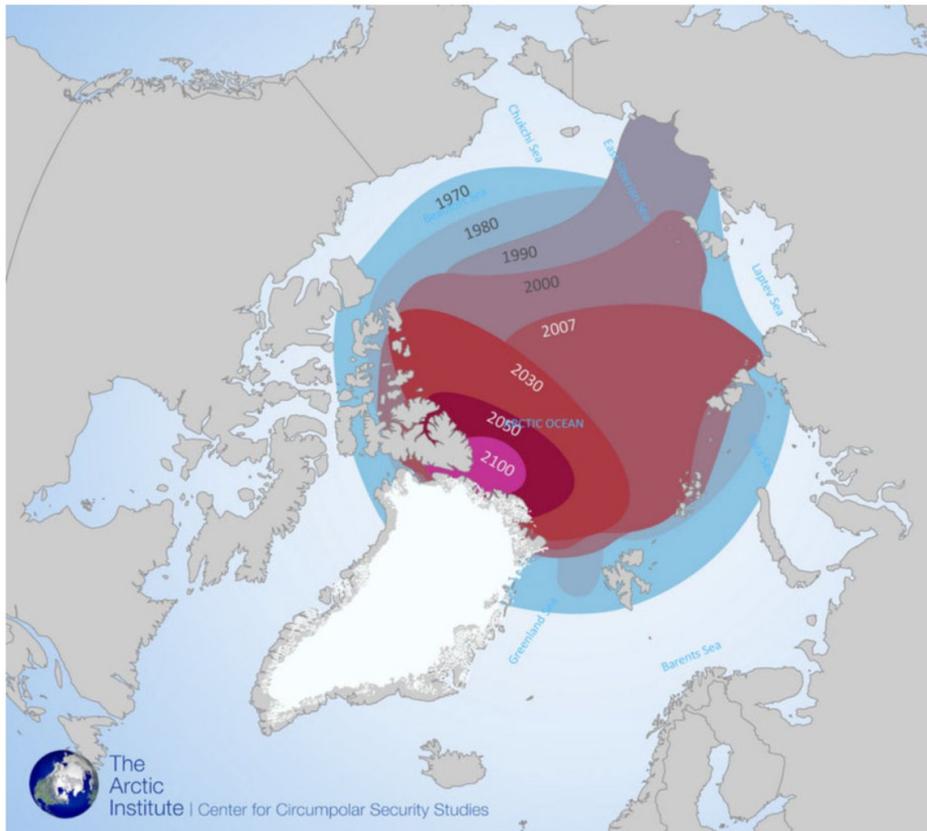
(source: Khon et al. 2009, p. 763)

Appendix no. 8: Various estimates of the Arctic ice progression in the 21st century (maps)



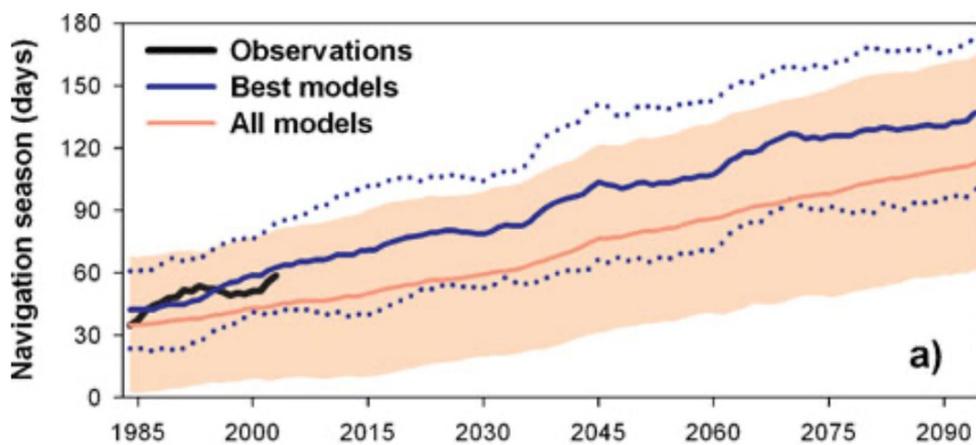
(source: Khon et al. 2009, p. 761)

Appendix no. 9: Historical progression and receding ice forecasts in the Arctic (map)



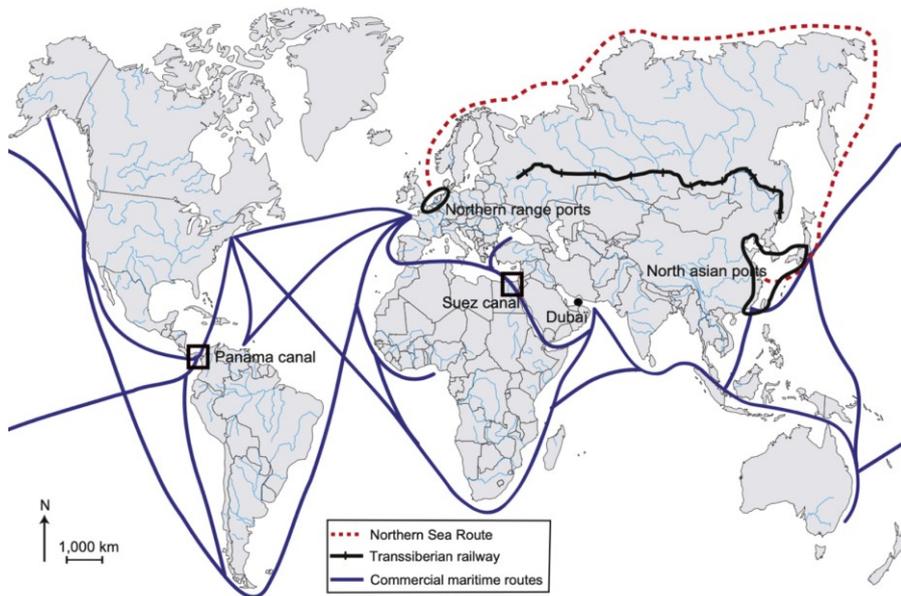
(source: Bekkers, Francois and Rojas-Romagosa 2016, p. 1100)

Appendix no. 10: NSR navigation season length from Kara Strait to Bering Strait - historical progression and future expectation (graph)



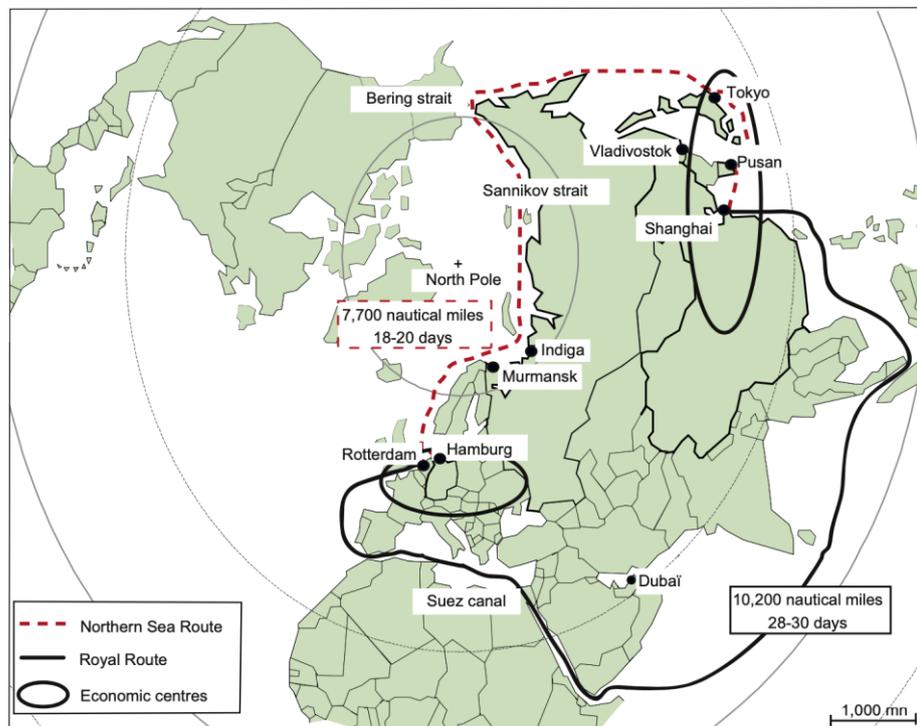
(source: Khon et al. 2009, p. 764)

Appendix no. 11: Essential international commercial routes (map)



(source: Verny and Grigentin 2009, p. 108)

Appendix no. 12: Economic centers of Europe and Asia and the maritime corridors connecting them (map)



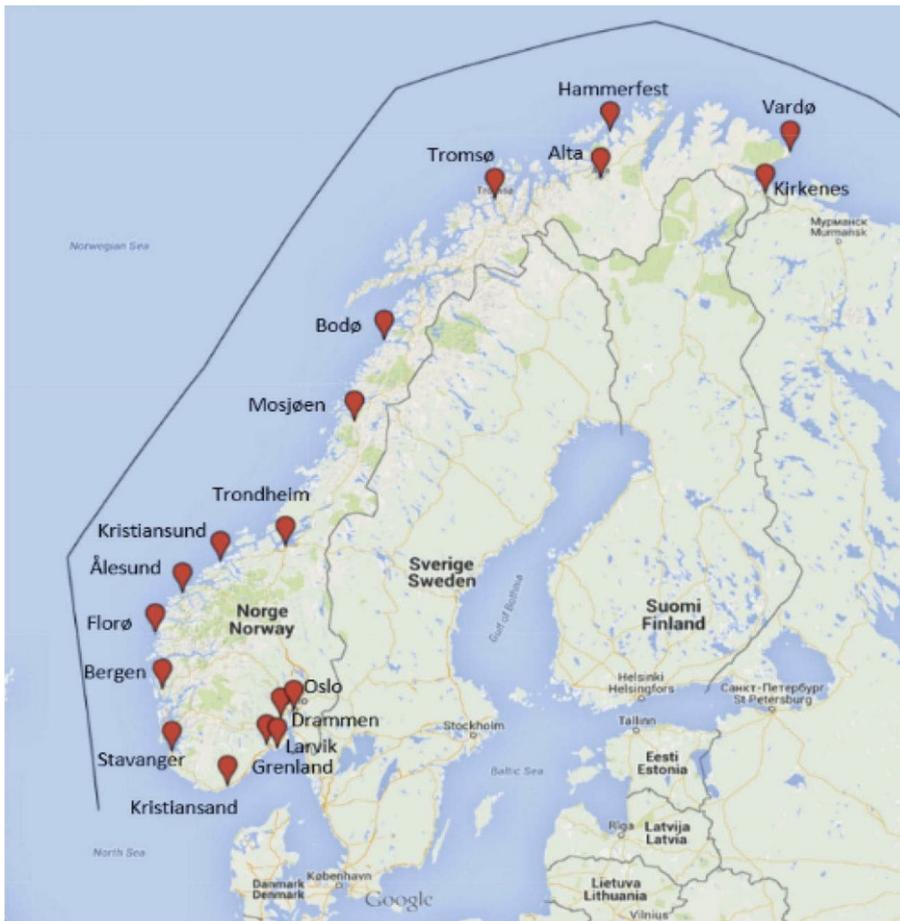
(source: Verny and Grigentin 2009, p. 112)

Appendix no. 13: Comparison of the NSR and the Suez Route distances (table)

From	To	Great-circle formula (km)	SSR (km)	NSR (km)	NSR against SSR % change
China	Netherlands	7,831	19,942	15,436	-23
China	Belgium	7,971	19,914	15,477	-22
China	Germany	7,363	20,478	15,942	-22
China	UK	8,151	19,799	14,898	-25
Japan	Netherlands	9,303	20,996	13,172	-37
Japan	Belgium	9,464	20,976	13,345	-36
Japan	Germany	8,928	21,536	13,083	-39
Japan	UK	9,574	20,779	13,182	-37
South Korea	Netherlands	8,573	20,479	14,200	-31
South Korea	Belgium	8,722	20,458	14,373	-30
South Korea	Germany	8,140	21,019	14,110	-33
South Korea	UK	8,875	20,262	14,210	-30
Taiwan	Netherlands	9,457	18,822	15,601	-17
Taiwan	Belgium	9,587	18,801	15,774	-16
Taiwan	Germany	8,959	19,362	15,511	-20
Taiwan	UK	9,790	18,605	15,611	-16

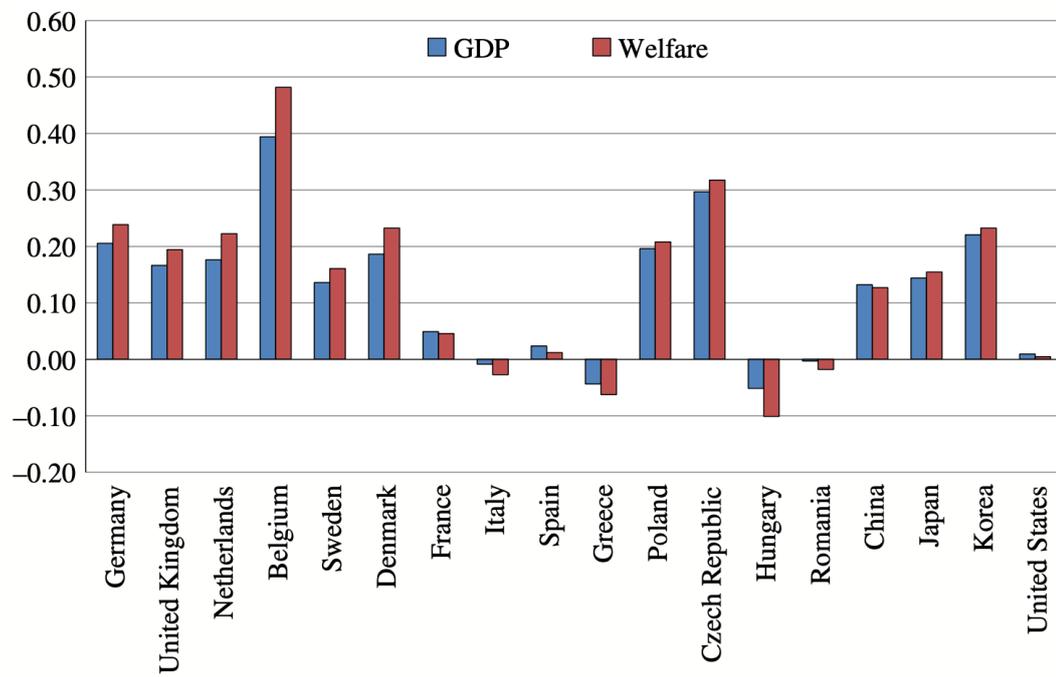
(source: Bekkers, Francois and Rojas-Romagosa 2016, p. 1103)

Appendix no. 14: Norwegian coast port structure (map)



(source: Solvang et al. 2018, p. 496)

Appendix no. 15: Estimated effects of the NSR development on GDP and welfare per capita (graph)



(source: Bekkers, Francois and Rojas-Romagosa 2016, p. 1120)