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Challenges along the Middle Corridor: A Case Study for Port of Baku

MADIA2024: Obaidullah Yaqoobi, Hasinah Abdul Halim, Murad Rahimov

Contact email: oyaqoobi15085@ada.edu.az, hhalim16387@ada.edu.az,
mrahimov16664@ada.edu.az.

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STUDENTS' NAMES: Hasinah Abdul Halim

Murad Rahimov

Obaidullah Yaqoobi

APPROVED:

Faculty Supervisor: Lala Jumayeva

Organisation Supervisor: Natavan Aghayeva

Dean of the School: Azar Babayev

May 17, 2024.

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Signed: Hasinah Abdul Halim

Signed: Murad Rahimov

Signed: Obaidullah Yaqoobi

May 17, 2024

Abstract

The Middle Corridor is a modern version of the Ancient Silk Road that connects China, the Central Asian countries of Uzbekistan, Kazakhstan, and Turkmenistan with Azerbaijan and Georgia in the South Caucasus, and eventually into Türkiye. It faces geopolitical and non-geopolitical challenges that serve to influence its vital importance in relation to the INSTC or the North-South Corridor and the Northern Corridor. The project investigates these challenges and provides policy measures that look at political advocacy by navigating the intricacies of intercultural communication between Iran and Russia, improvement of the digitalised port model of the Port of Baku, and technological advocacy by way of knowledge and data sharing, as well as the creation of a 4IR-ready workforce.

Keywords: Middle Corridor, Geopolitics, Infrastructure, Political advocacy, Digitalisation, Technological advocacy, Port model, 4IR.

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List of Abbreviations

4IR – Fourth Industrial Revolution

AI – Artificial Intelligence

ASCO – Azerbaijan Caspian Shipping Company

BCP – Gardabani - Böyük Kasik

C4IR – Centre for Analysis and Coordination of the IV Industrial Revolution

CAREC – Central Asia Regional Economic Cooperation

CET – Continuing Education and Training

CSTO – Comprehensive Security Treaty Organisation

EATL – Euro-Asian Transport Linkages

GTI – Greater Tumen Initiative

INSTC – International North-South Transport Corridor

IoT – Internet of Things

OBOR – One Belt One Road

OSJD – Organisation for Cooperation of Railways

OTIF – Intergovernmental Organisation for International Carriage by Rail

PIMS – Port Information Management System

PoB – Port of Baku

SCO – Shanghai Cooperation Organisation

CHAPTER 1. INTRODUCTION

Corridors are not merely pathways since they comprise complex and integrated networks that facilitate trade and connectivity (Grosheva, 2023). The operational effectiveness and strategic relevance of corridors in the international trade arena are contingent upon cross-national regulation and management that involve the public and private sectors. The COVID-19 pandemic emphasised the importance of overland transportation when maritime transport was disrupted and air freight skyrocketed in price (Kalyuzhnova & Pomfret, 2021). The Trans-Caspian International Transport Route or the Middle Corridor benefitted from this disruption.

Figure 1.

Map of The Middle Corridor Route.



Source: Azernews. 2024. (January 18). <https://www.azernews.az/nation/220505.html>

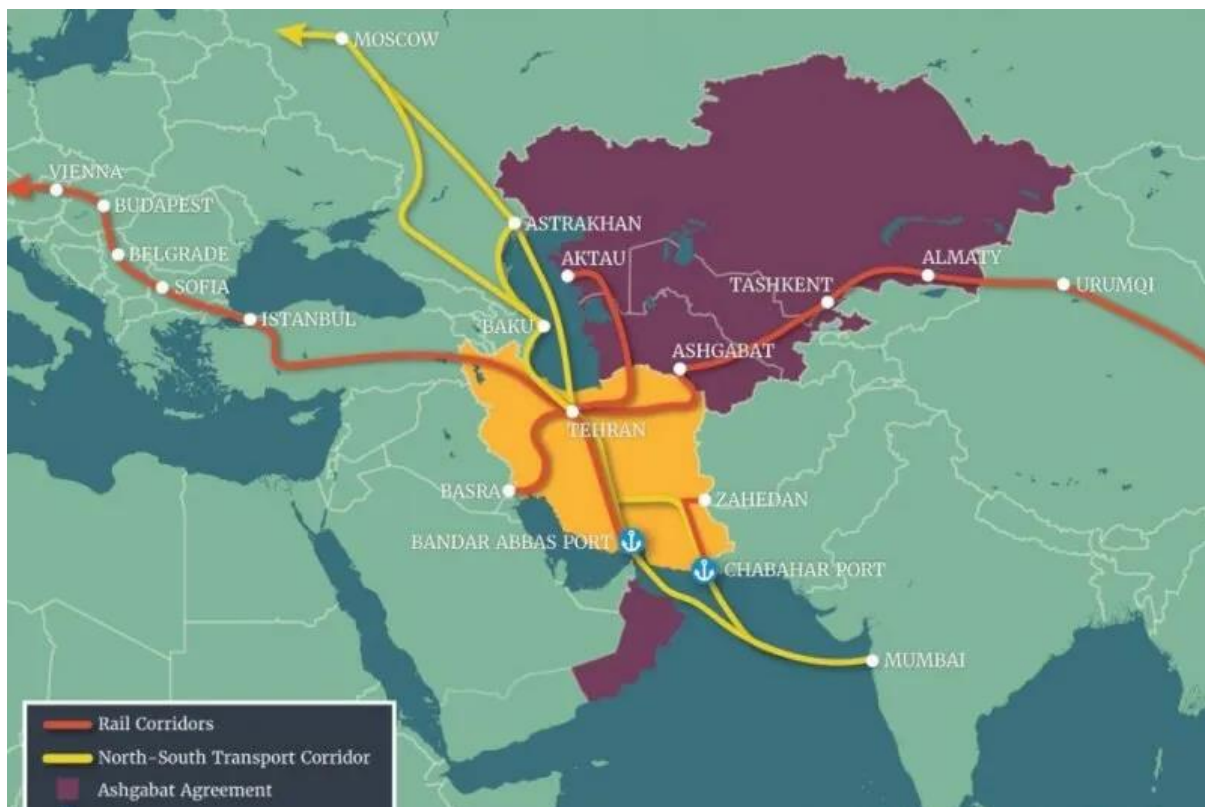
The Middle Corridor (*Figure 1*) is a modern version of the Ancient Silk Road that connects China, the Central Asian countries of Uzbekistan, Kazakhstan, Turkmenistan with Azerbaijan and Georgia in the South Caucasus, and eventually into Türkiye (From personal communication with PoB, February 13, 2024). It is a multimodal corridor consisting of overland and maritime sections. The two sea routes of the Middle Corridor are: 1) the Caspian Sea, which is served by four ports: ports in Aktau and Kuryk in Kazakhstan, Turkmenbashi port in Turkmenistan, and port Baku in Azerbaijan; 2) the Black Sea is served by the port in Batumi, Georgia, on the east; Chornomorsk in Ukraine in the west; Constanta, Romania in the

north west; Istanbul and Mersin in Türkiye. Ports in Türkiye, Ukraine, and Romania connect the Middle Corridor trade route to Europe. In total, the Middle Corridor encompasses 4,250 km of railway and 500 km of sea route.

There are two other corridors in the region that stand as competitors with the Middle Corridor: The North-South Corridor and the Northern Corridor.

Figure 2.

Map of the North-South Corridor.



Source: *The Maritime Executive*. 2022. (June 12). <https://maritime-executive.com/article/iran-sets-up-caspian-to-gulf-intermodal-route-for-russian-cargo>

The INSTC or the North-South Corridor (*Figure 2*) was established between Russia, India, and Iran (Asia Regional Integration Center, n.d.), but has since included Azerbaijan, Armenia, Kyrgyzstan, Tajikistan, Kazakhstan, Türkiye, Belarus, Ukraine, Bulgaria, Syria, and Oman. The North-South Corridor is problematic as Russia and Iran are two countries facing sanctions (Shokri, n.d.). Connectivity is another issue as the rail link is not fully completed and road networks are still under construction. The Rasht-Astara railway is the only remaining rail

link for the North-South Corridor (Kaleji, 2023). Once the 164 km railway is completed the Corridor will be fully functional and serve as the direct rail link from the Persian Gulf, Iran to St. Petersburg and Moscow, Russia. However, the construction of the Rasht-Astara railway has faced setbacks and until it is completed, transportation of goods is being done by transferring from rail to trucks and back to rail (Financial Tribune, 2023).

The Northern Corridor runs from Russia's Far East all the way into Europe while passing via China (UNESCAP, 2019). The Trans-Siberian Railway cuts through Russia, Mongolia, Kazakhstan, and China. The Northern Corridor also links countries in the Far East such as South Korea to Europe, thus strengthening its importance as the backbone of transport connectivity between Europe and Asia.

A comparison between the Northern Corridor and the Middle Corridor showed that the former surpasses the latter in the following aspects:

1. Transport capacity is 95% that of the Middle Corridor (Kostev, 2023).
2. Mode of transportation along the corridor via land either by rail or road, whereas the Middle Corridor has the sea component that requires passing through the Caspian Sea. The land aspect of the Northern Corridor terminates at the Baltic Port in St. Petersburg and in Eastern Russia at the Vladivostok, Vostochny, and Nahodka ports.
3. It was the most frequently used transport link for Europe and Asia as it is considered the fastest non-air freight connection that links China and Europe when compared to the Middle Corridor, as seen in Table 1 below (OECD, 2023).

Table 1. Estimation of cost and time for the EU-China corridor in 2020.

	Cost (USD)	Avg. time (days)	Northern Europe time (days)	Central Europe time (days)	Balkans time (days)
Northern Corridor	2,800 - 3,200	14 - 18	16	15-16	20
Middle Corridor	3,500 - 4,500	16 - 20	18	17	14
Maritime Route	1,500 - 2,000	28 - 40	28 - 40	28 - 40	28 - 40

Source: OECD. 2023 (December 13). <https://www.oecd.org/publications/realising-the-potential-of-the-middle-corridor-635ad854-en.htm>

4. Due to the importance of this corridor for many countries in Eurasia, Eastern Europe, and Central Asia, regional and sub-regional initiatives have been taken in order to improve the seamlessness of the corridor, such as the OSJD, CAREC, GTI, EATL, and OTIF (UNESCAP, 2019).
5. Presence of dry ports and logistic terminals along the Northern Corridor, which greatly contribute to the seamless connectivity and logistics.
6. Strategic nodes with special economic zones have been established such as in South Korea (Busan, Incheon, Gwangyang, and Chongju), North Korea (Rason, Pong Yang, Kaesong, Haeju, Nampo, and Rason), and China (Tianjin, Dalian, Urumqi, Shenyang, Lianungang, Xi'an, Huhhot).
7. China's BRI makes use of the entire Northern Corridor for the pursuit of co-prosperity and cooperation between countries; thus, it channels its investment heavily in the Northern Corridor.

Taking into account the aforementioned factors of the Northern Corridor, the lucrative and traditional route of this corridor proves to be a strong competitor to the Middle Corridor. Its well-established connectivity, infrastructure, regional cooperation, and investments have led to unsubstantial traffic flows via the Middle Corridor (de Waal, 2021). This is the problem that's been identified within the scope of this project: **The Middle Corridor faces significant geopolitical and non-geopolitical challenges that impedes its attractiveness as a viable**

trading route. However, owing to the Russia-Ukraine crisis that started on 24 February 2022, the Northern Corridor was gravely disrupted by the sanctions on Russia. Disruptions include increases in freight prices, significant cargo delays, and decreases in container shipping by a minimum of 35% between China and Europe (OECD, 2023, p. 16). Hence, there is an urgent need to redirect the cargo traffic elsewhere in order to keep the global supply chain going. We saw that happening during the COVID-19 pandemic wherein the Middle Corridor benefitted from the disruption to maritime routes and air freight. That closest alternative is the Middle Corridor and with the Northern Corridor now becoming less attractive, the Middle Corridor is stepping up once more to maintain the global supply chain.

Given the geographical landscape of the Middle Corridor, it involves a multimodal transport network of road, rail, and maritime. Transit of goods between China the Balkans is 6 days shorter when compared to the Northern Corridor, and with an additional day between China and Central Europe. In 2023, there was an 86% increase in cargo from 2022 figures (Mammadov, 2024). The 2.8 million tonnes of cargo handled is expected to increase to 4 million tonnes for the year 2024. Although the opportunity for the Middle Corridor to become a prominent trading route that connects Asia to Europe exists, the project has identified geopolitical and non-geopolitical causes that contribute to the crux of the research problem. This will be addressed in detail in Chapter 2.

1.2. Methodology

The aims of the project are as follows: 1) To identify the geopolitical and non-geopolitical causes that are contributing to the research problem; 2) To provide policy alternatives that are tailor-made for the identified causes. The project is of great worth as it provides insight on the geopolitical and non-geopolitical challenges of the Middle Corridor that would prove to be instrumental to the Port of Baku. Port of Baku positions itself to become the largest industrial and logistics zone in the Caspian Sea region (Port of Baku, 2021), and as such,

identifying the said challenges would be crucial in meeting its goals. Moreover, the Port of Baku sits in a strategic location of the Middle Corridor that is becoming more important for the transportation of goods and supply chain link, particularly from Europe to Central Asia and China which is part of Europe's initiative (Port of Baku, 2021).

The project utilised qualitative, semi-structured, in-depth interviews for primary data collection and analysis purposes. Three experts related to the field were interviewed in order to gain insight for the formulation of this project's policy alternatives. These interviews served as the project's primary data. Interviews were done in person and online via Zoom after obtaining their verbal consent. All interviews were conducted in English with an average time duration of 60 minutes. They were audio-recorded and transcribed for coding and analysis. For interviews wherein the interviewee declined to be audio recorded, a note taker was assigned. The project employed a content analysis. All interviewees were asked the following questions:

1. How is the Port of Baku contributing to the importance of the Middle Corridor now?
2. What are the logistical and infrastructural challenges that Port of Baku is currently facing?
3. What sort of investments does the Port of Baku need in order to really transform the Middle Corridor into a vital route?
4. Given that the South Caucasus is a region known for its instability, what role(s) can Azerbaijan play to maintain the importance of the Middle Corridor?
5. What other measures can Azerbaijan take towards improving the positioning of Port of Baku in the Middle Corridor and thus living up to its motto, "your hub in Eurasia"?

Reliability and Validity Measures

For face validity, the interview questions were reviewed by the project's academic supervisor. A pre-test was also conducted with representatives of Port of Baku to assess whether the questions were measuring the geopolitical and non-geopolitical constructs. Having a semi-structured questionnaire that administered the questions in a certain manner ensured there is interviewer reliability. Inter-rater reliability was ensured based on the degree of agreement between the project's team members during the data coding procedure. This was conducted to prevent data falsification and fabrication, biased reporting, and data omission (Cole, 2023).

The interviewees were foreign experts in geopolitics and geo-economics. One is a European Affairs expert in geopolitics, geo-economics, and sustainability. Another is an expert in the energy field in the capacity of international relations and cooperation for countries in the Middle East and post-Soviet landscape. The third interviewee is a former ambassador to Azerbaijan.

Secondary data was obtained through research on existing literature related to the project. Another approach is identifying case studies of ports or countries that have carried out policies that could be applied to the Port of Baku's case. Limitations to the project included massive challenges in securing interviews with local experts. They were largely unresponsive and unwilling to be interviewed for the project. As instrumental as the foreign experts have been in this project, the absence of local experts meant the project lacked a local element per se.

The paper comprises five chapters addressing different facets of the policy problems. Chapter 1 presents a theoretical and conceptual background to the problem along with a description of the outline of the policy paper. Chapter 2 goes into problem description, details the identified causes of the problem, analysis of current and/or past policy measures. Chapter

3 provides the policy alternatives that address the causes as identified in Chapter 2. Chapter 4 is an evaluation of the policy alternatives and Chapter 5 brings together the findings of the paper along with policy recommendations. The conclusion part includes selecting the policy that is deemed suitable for addressing the policy problem.

CHAPTER 2. PROBLEM DESCRIPTION

It has been identified that there are several causes that impede the attractiveness of the Middle Corridor as a vital trading route, which have been divided into geopolitical and non-geopolitical causes. The division was necessary as the geopolitical causes deal with relations between countries by virtue of the countries' geography (Geopolitical Futures, 2022), whereas the non-geopolitical causes within the context of this project are related to infrastructure, technology, and transportation. The division is further necessary as geopolitical causes deal with traditional state actors and non-geopolitical causes bring in non-traditional state actors with vital roles in matters pertaining to the country and its international affairs (Wijninga, Oosterveld, Galdiga, & Marten, 2016).

2.1. Geopolitical Causes

The geopolitics of the South Caucasus have been historically influenced by the Russian Federation in the north and Islamic Republic of Iran in the south, albeit in their different formations. To the east of the South Caucasus, Kazakhstan's foreign policy is seen as the linchpin for the eastern side of the Middle Corridor. Russia's relations with South Caucasus countries and Iran will be discussed first, then followed by Kazakhstan's role as the linchpin in the eastern Middle Corridor.

2.1.1 Geopolitical Causes: Russia's Relations with the South Caucasus Countries and Iran

It is difficult to characterise Russia's South Caucasus strategy as consistent given the substantial shifts it has undergone in the 1990s (Naumkin, 2002). Russia has always considered the South Caucasus as part of its post-Soviet domain of influence, and it used economic, military, and other instruments of dominance to approach the region uniformly (Badridze et al, 2024). Although Russia tries to maintain its importance with all three nations of the South Caucasus, its relationship with each country in the region has been different.

Georgia is one of the countries on the North-South Corridor, and it has intricate relations with Russia. Since Mikhail Saakashvili's victory in the 2003 Rose Revolution, Russia's relationship with its Caucasian neighbour has gone through distinct and unpleasant phases (Tsygankov & Tarver-Wahlquist, 2009). After the diplomatic relations between the two countries had been damaged severely, Russia launched its invasion of Georgia on August 8, 2008, sparking the first war of the twenty-first century in Europe (Dickinson, 2021). Moscow showed that it was willing and able to aggressively oppose Washington's plan for a normative international order in which small states are free to manage their own affairs without interference from superpowers and veto NATO expansion into its neighbourhood (Kofman, 2018) Although Western nations and Georgia had close relations at that time, none of the countries supporting Georgia was willing to provide beyond humanitarian and diplomatic aid, leading Georgia to fight the superior Russian forces on its own (Pruitt, 2018).

Following the 2008 conflict, Abkhazia and South Ossetia were recognised as "independent states" by the Kremlin, and Georgia lost authority over these regions (Bochorishvili, 2023). The economy of Abkhazia and South Ossetia is reliant on Russia, and the majority of the population possesses Russian passports and uses the Russian rouble as money, which also indicates how the economy is dependent on Russia (Reuters, 2024).

The economy of Georgia is also quite dependent on Russia. Georgia's reliance on Russia for its economic needs has lessened in 2023 as compared to 2022, although it is still far greater in comparison to 2021. In 2023, the decline in remittances was the primary factor contributing to the reduction of economic reliance on Russia (Transparency International Georgia, 2024). Sole proprietorships make up 96% of Russian enterprises that were registered in 2022–2023. For comparative purposes, 51% of Russian corporations that were registered in 2021 were sole proprietorships. 99% of proprietors have last names that are not Georgian (Transparency International Georgia, 2024).

Armenia, which is the smallest country in the South Caucasus, was considered to be the closest nation to Russia since its independence. However, the relations between the two countries have deteriorated significantly after Azerbaijan restored its territorial integrity by liberating lands that were occupied by Armenian forces. While Azerbaijan and Armenia are yet to sign a peace agreement, Armenia keeps distancing itself from Russia. After Azerbaijan was able to reclaim all its territories occupied by Armenia, most Armenians do not consider Russia to be neither an ally nor a security guarantor (Zolyan, 2023). The Prime Minister of Armenia, Nikol Pashinyan, is not shy to express that its nation can no longer be fully dependent on Russia with regard to military assistance, and he is seeking to deepen the security relations with the United States, India, and France (Faulconbridge, 2024).

While Armenia is still a member of the CSTO, its desire to leave the organisation has been stated by the officials of the country on different platforms (Eruygur, 2024). Russia's President Vladimir Putin has expressed that leaving the organisation would not be a beneficial decision for Armenia, showing Russia's concern of having weekend influence in the region (Faulconbridge, 2024). The relations between the two countries were exacerbated further after Armenia ratified the Rome Statute of the International Criminal Court in 2023. Despite Armenia's claim that the action is not directed against Russia, the latter side finds this move to be hostile as the Rome Statute requires every member to abide by the arrest warrant for President Vladimir Putin, if he is to visit the country. (Avetisyan, 2023).

While Armenia is looking towards the West, its dependence on Russia in terms of economy and energy cannot be underestimated. Armenia is not only dependent on Russia when it comes to its energy, which is mainly provided by Gazprom Armenia, a Russian energy company, but the biggest proportion of money coming to Armenia is sent from Russia, 3.6 billion dollars out of 5.1 billion dollars in total (Mgdesyan, 2023). The Armenian government

puts the country's electrical supply and residents' financial stability in jeopardy by insisting on strained relations with Moscow (Latifova, 2024).

Azerbaijan, on the other hand, has strengthened its relations with Russia after reclaiming its territories that had been under Armenian control for about three decades. After the two countries signed an agreement in 2022, the president of the Republic of Azerbaijan, Ilham Aliyev, stated that the relations between the two countries reached the level of alliance. This is expected to be supported further by Azerbaijan's important role in the North-South Corridor, increasing trade connectivity among India, Iran, Azerbaijan, and Russia. Unlike the other two countries of the South Caucasus, Azerbaijan is not leaning toward the West but becoming closer to Russia (Badridze et al, 2024).

The pact signed between Azerbaijan and Russia in February 2022 includes “sustainable full-scale operation of the North-South corridor” (Benson, 2024). Russia has also opened an Azerbaijani customs corridor with reduced procedures (Abdullayeva, 2023). Because of its location, Azerbaijan is an important link in the developing commercial network. Since Russia shares a border with Azerbaijan, the trade relations between the two countries necessitated mainly by Western sanctions on Russia due to the Russia-Ukraine conflict is expected to flourish through the North-South Corridor.

While the talks about the North-South Corridor had been around for a number of years, the importance of it became more apparent after the beginning of the conflict between Russia and Ukraine. The corridor is expected to significantly reduce the cost of transport by bypassing the Suez Canal and connecting the Russian city of Saint Petersburg with India's Mumbai through Iran and Azerbaijan (Chazan, 2023). Around \$20 billion is being invested in the corridor, showing how great power competition results in countries seeking new partners in order to avoid sanctions imposed by the West (Bloomberg, 2022). The North-South Corridor is also expected to be helpful in terms of strengthening ties of the “Caspian Five”, comprising

Azerbaijan, Russia, Iran, Kazakhstan, and Turkmenistan. Russia also aims to reenergise the economies of certain Russian regions with the help of the North-South Corridor, and the Astrakhan region and the city of Astrakhan are expected to be the main beneficiaries of the corridor (Nikolaev, 2024)

However, the corridor is yet to be completed. Many road connections within Iran are still being built, despite the fact that some portions of the corridor, such as the railway connecting Iran and Azerbaijan, have already been finished (Shokri, n.d.). There was little question that businesspeople would follow Russian President Vladimir Putin's advice when he asked them to invest in building the Rasht-Astara line, a portion of the North-South Corridor that connects the Iranian city of Rasht with the Azerbaijani city of Astara, in mid-March 2023. However, it was made public in May that the project would actually be funded by the Russian government, which would lend Iran €1.3 billion for it (Karimli, 2023). It is believed that the International Bank of Azerbaijan has decided to provide \$500 million to finance the building of the Rasht-Astara railway (Aguinaldo, 2016).

Azerbaijan and Armenia, two of the three nations in the South Caucasus, have experienced years of animosity between each other due to the Armenian occupation of internationally recognised territories of Azerbaijan for a period of around thirty years. The Second Karabakh War came to an end with the trilateral agreement of November 2020, and Armenia agreed that it would give Azerbaijan an unimpeded transport route between mainland Azerbaijan and Nakhchivan, an exclave that is a part of Azerbaijan (Eruygur, 2024). Despite agreeing to provide a transport corridor, often referred to as the Zangezur Corridor, Armenia has failed to keep its promise, resulting in not making significant progress in signing a peace agreement between Azerbaijan and Armenia (Ashirov, 2024). The Zangezur Corridor is expected to shorten the distance in the Middle Corridor, which holds significant importance for Azerbaijan's economic and transit potential, by 400 kms (From personal communication with

PoB, February 13, 2024) The corridor's increased connectivity will stimulate trade links amongst the several states. Both NATO and Russia seem to be in favour of expanding the transportation route, despite the fact that they have differing opinions on a number of matters, from the Middle East to the situation in Ukraine.

Having said that, there is also a nation that is against the opening of the Zangezur Corridor. Iran has repeatedly stated that it would consider unhindered transportation without checkpoints between Azerbaijan and Turkey to be a threat for its national security (Ramezani, 2023). Iran views its 40-mile border with Armenia as one of its most strategically significant areas of land when it comes to its national security objectives (Ritter, 2023). Despite having closer relations with Azerbaijan thanks to the INSTC, Iran is still against the Zangezur Corridor in an indirect manner, preventing future developments (Valiyev, 2022).

2.1.2. Geopolitical Causes: Kazakhstan's role in the Regional Geopolitical Landscape

Kazakhstan as the biggest Central Asian country with seaports access to the Caspian Sea, is a linchpin to the middle corridor (Satubaldina, 2024). After the Russia-Ukraine crisis and sanctions on the Northern Corridor, new opportunities emerged for Kazakhstan to diversify its supply routes (Ozat and Nelson 2023).

In the heart of a geopolitical nexus, Kazakhstan stands amidst the competing interests of Russia and China. In one respect, it is a member of the CSTO led by Russia and the Eurasian Economic Union, and in the other respect, a member of the SCO as well as OBOR led by China. Throughout his prolonged presidency, President Nazarbayev consistently worked to maintain the nation's strategic sovereignty and ensure a balanced relationship with both Beijing and Moscow (Liechtenstein, 2022).

Meanwhile, the Middle Corridor is experiencing increasing interest and support from the USA and the EU, particularly the EU in terms of receiving energy supplies and supply chains to mitigate its reliance on Russian-dominated trade routes with a significant amount of

investment from the EU targeting Kazakhstan's transport infrastructures, while the current exports of Kazakhstan to EU is mostly raw materials and energy (Muratova et al., 2023). For the EU to limit the influence of Russia, Kazakhstan is the best alternative to experience a prompt delivery of goods via the Middle Corridor (Ozat and Nelson 2023).

However, the enduring animosity between the West and Russia, China, and Iran entrenched the perception of the region as marked by increased strategic risk and uncertainty. However, Kazakhstan continues to be vulnerable to Russian influence (Ozat and Nelson 2023). Moscow has the potential to fracture the connection by influencing Kazakhstan, either politically or through the utilisation of more extreme measures if it deems such actions necessary (Liechtenstein, 2022). However, this is contingent on the geopolitical dynamics in Ukraine. Nonetheless, it is also probable that in case if the Russia-Ukraine crisis comes to an end, then the cooperation of Kazakhstan as a key country to the Middle Corridor may face constraints by Russia's foreign policy, while Russian aims to secure access to cost-effective Central Asian gas supplies, allowing it to capitalize on higher prices in the European market through its projects (Shokori, n.d.).

According to the OBOR documents published by China, the Middle Corridor is not a priority and it will affect Kazakhstan's policy approach to this route (Inan & Yayloyan, 2018), but the new emerging geopolitical reality led China to realise that the long run focusing on Russia's option would be a dead-end and should search for new alternatives, still keeping Kazakhstan as a linchpin to its policy (Sánchez, 2023).

Furthermore, connecting Russia to Iran, Kazakhstan presents a very crucial geostrategic stance. Kazakh leaders express an interest in working on the facilitation of a connection with Iran via the Caspian Sea, even though there is a development to establish a direct shipping line (Boltuc, 2023). Related to the geopolitical consequences, there would not be a direct threat to the Western countries, but to some extent, cases of supporting Russia to evade the sanctions

and the transport of Shahed drones from Iran to Russia are weighing into consideration (The Iran Primer, 2023). Thus, the Western concern would be exacerbated by the shipping capacity of Kazakhstan and overall, the Caspian region states (Duffy, 2023).

Considering the North-South Corridor which is a priority to Russia and Iran (Labardini, 2023), in case Azerbaijan focuses more practically on the other route via Georgia to Türkiye, the development of the Middle Corridor will be less fortunate to not be challenged by Russia in Kazakhstan (Duffy, 2023). Kazakhstan will most likely continue to keep the delicate balance between Azerbaijan, Russia, and China, and its approach will be based on an assessment of this complex geopolitical layer that may lead to a shift in its policy towards more realistic options or continue its supplies via the Northern Corridor. However, the current bilateral trade between Kazakhstan and Azerbaijan may continue accordingly, while Kazakhstan's Prime Minister Alikhan Smailov stated that the planned bilateral trade volume of Kazakhstan via the Caspian Sea is around 100 commodity items estimated over \$300 million that will make \$1 billion per year (Ozat and Nelson 2023).

2.2 Non-Geopolitical Causes: Challenges in Hard & Soft Infrastructure

Given that the Middle Corridor is a multimodal land and sea transport corridor, compared to the Northern Corridor, it is still underdeveloped and grappling with serious challenges along participant states territories. The route between Azerbaijan and Kazakhstan is paramount to this end (World Bank, 2023). The Port of Baku in Azerbaijan and the Port of Aktau in Kazakhstan are the essential nodes of this corridor (Sánchez, 2023). Since 2022, due to the increasing demand for transport between these ports, challenges have emerged along this corridor in terms of delays in transit times for more than 40 days affecting the status of the Middle Corridor as a potential alternative to the Northern one. In addition, insufficient fleet capacity raised the transit prices which challenged the exporters to adjust themselves to the prices, it also exposed a reliability problem of the route as a potential economic corridor (World

Bank, 2023). On 22-23 June 2023, Kazakhstan, Azerbaijan, and Georgia signed a trilateral agreement to address those challenges which are impeding the operationalisation of the Middle Corridor. Overcoming these challenges is difficult but not impossible (Ozat and Nelson 2023).

The capacity of a corridor refers to the maximum volume of goods it can accommodate and is defined by two key factors. First, it is shaped by the infrastructure component within the corridor that has the lowest capacity. Within the roads, railways, and ports of a corridor, if one of them has the lowest capacity for handling goods, that is affecting the entire capacity of the corridor. Second, even if individual components have a high capacity, inefficiencies in the transfer of goods also result in bottlenecks along the corridor (Gašparík et al., 2021). According to the World Bank (2023), enhancing transportation infrastructure is essential for improving the capacity and operational efficiency of the Middle Corridor.

2.2.1 Hard Infrastructure: Ports and Maritime Challenges

The ports and the container capacity represent significant bottlenecks along the Middle Corridor. There is an imbalance in the capacity of ports both in Kazakhstan and Azerbaijan, especially, the Port of Baku exhibits a more constrained capacity compared to Aktau, resulting in a distribution of resources that doesn't fully optimize the capacity of the Middle Corridor's operations (World Bank, 2023).

Kazakhstan's two ports are pivotal in the Middle Corridor namely Aktau and Kuryk, with an aggregate capacity of 24 million tonnes per annum (Mt p.a). The National Maritime Company Kazmortransflot (KMTF) of Kazakhstan is operating with 5 oil tankers, 3 container vessels, and a cargo boat. Using 3 specialized container vessels, the annual one-way capacity of Aktau-Baku through KMTF is 37,000 TEU, but practically, the amount is reduced to 23,500 TEU since 10% of the KMTF vessels serve Iranian ports as well. These nominals reveal a current imbalance in flows, while the Aktau-Baku direction demands more. Moreover, the vessel's engines and propellers are also challenging the speed of delivery to Baku, while there

is a possibility to increase speed and lessen the time from 3.5 days to 2 or even 1 day (World Bank, 2023). At the same time, there isn't a fertiliser terminal in Kazakhstan ports, and lacks sufficient digital facilities to meet the demand for a modern corridor that connects China to Europe (From personal communication with PoB, 18 March 2024).

On the other hand, Alat port with an overall capacity of 15 Mt. p.a presents a multimodal route to the Middle Corridor. That projects a mismatch of capacity between Aktau and Alat ports. The ASCO possesses numerous oil tankers and a fleet of dry cargo ships (including 2 modern ro-pax carrying and rail wagons, 2 ro-ro ships, 15 dry cargo vessels, and 2 rail ferries). Compared to KMTF, ASCO does not own any big vessels i.e. container ships. The annual one-way capacity of Aktau-Baku through KMTF is 3,100 TEU. The cargo handling process still challenges the effectiveness of Alat which is a total of 27 days. But the shipping is faster than KMTF which is 2.5 days (World Bank, 2023). Similar to Aktau, the Alat port also faces the challenges of developing a digitalized port. Even there is a vital need for the Port of Baku to construct new ports in order to avoid congestion and smooth handling of cargo. To this end, the Port of Baku will need private investors (From personal communication with PoB, 18 March 2024). In both Aktau and Alat ports, the tariffs are above the international standard and there is no unified tariff system to regulate the prices. The same goes for the Georgian ports as well, as their tariffs are the highest across the black sea (World Bank, 2023)

2.2.2 Hard Infrastructure: Railway Deficiencies

When it comes to transporting heavy and bulky goods over long distances, compared to roads, railways offer more reliable and flexible solutions, i.e. economies of scale, fuel efficiency, cost-effectiveness, and road traffic congestion reduction. Embracing rail transport for freight supports key policy aims to realise overarching policy priorities such as improved connectivity, environmental sustainability, and enhanced safety protocols. This is also applicable to the realm of cross-border transportation. But, railway connectivity is not without

challenges that can vary as limited flexibility, longer transit times, infrastructure limitations, and management models. The rail sector's insufficient interoperability emerges as a key challenge when contemplating cross-border transportation. It is a multifaceted obstacle that is arising from a blend of technical, administrative, and infrastructural challenges, which aggregately give rise to operationalising issues such as delays in transport and escalated operating costs for railway authorities (European Union Agency for Railways, 2022).

Along the Middle Corridor route, three main railways exist. (Kazakhstan Railways (KTZ), Azerbaijan Railways (ADY), and Georgian Railway (GR). These interoperable railways offer a comparative advantage to deliver the cargo faster than the current operational time. However, the localized hurdles in infrastructures, equipment, and operational procedures hinder the railway system from reaching its full capacity. The challenge arises when there is a disruption in freight flow at any point, that affects the overall flow of the corridor. According to the reports, there is a lack of equipment including cranes for 40ft containers to make efficient transshipment from one rail to another. In terms of operational procedures, the three countries strive to tackle the obstacles to establish a unified policy (World Bank, 2023).

Regardless of Kazakhstan's railways which have a developed and modern infrastructure, the BCP between Georgia and Azerbaijan represents a vulnerable structure that is also a big challenge to the Middle Corridor. The duration of transport is estimated at around 4 days because of locomotives and station capacity. The design of BCP is not similar to border stations that are crossing the most populated regions and it directly impedes their potential to expand. The train traffic management system and cross-border checkpoints along this route also hinder efficient transport (World Bank, 2023). As interoperability is identified as an advantage in railways, the existing system needs further modernization and investment (From personal communication with PoB, 18 March 2024).

2.2.3 Soft Infrastructure: Digitalisation Obstacles

The advent of Industry 3.0 & 4.0 has put digitalisation in the spotlight, improving the efficiency of business operations, notably in logistics and transportation. This trend signifies a shift towards a smarter model utilizing digital technologies like Internet of Things (IoT), AI, automation, and similar innovations that actually enhance increased availability of information, real-time data collection, optimization of logistic practices to minimize costs, broad connectivity, and increased transparency. Although transport and logistics services still require physical delivery, digitalisation is reshaping the entire supply chain (Bilgiliardi et al., 2022). For example, the case study of Busan Port in South Korea reveals that in the past the customer satisfaction has significantly decreased because the port failed to digitalise itself in a manner to provide customers with different information and process that information swiftly. Later, the adoption of a logistic information system increased user satisfaction, and even further digitalisation and automation led it to be the 6th largest container port and 2nd largest transshipment port in the world (Ministry of Economy and Finance of the Republic of Korea, 2019).

According to World Bank (2023) report, the Middle Corridor is facing significant challenges in achieving digitalisation that causes various problems. Issues with the flow of data pose challenges to the efficient functioning of the Middle Corridor. Along the ports, railways, and roads, shortcomings in information and data management contribute to inefficiencies. These weaknesses manifest in different ways:

1. Delays arise during the transportation of cargo between diverse service providers, especially between railways, ports, and international border checkpoints.
2. Limited tracking capabilities for shipments during their transportation.
3. Pricing fluctuations, leading to confusion and inefficiencies.

4. Manual exchange of data, leading to increased prices and delays in the clearance process for goods.

Relative to Kazakhstan and Georgia, Azerbaijan has spearheaded numerous initiatives aimed at the digitalisation of its logistics and transportation services. Yet, to ensure the Middle Corridor operates smoothly, it is crucial for the entire corridor to undergo digitalisation. Though ADY and the Port of Baku need to adopt effective policies towards full automation and digitalisation of its ports and railways as several aspects should be enhanced upon accordingly, while, as a matter of fact, Azerbaijan plays the role of a hinge in the Middle Corridor (From personal communication with PoB, 18 March 2024).

2.2.4 Soft Infrastructure: Shortfalls in the Workforce

The boom in AI as part of the Fourth Industrial Revolution (4IR) means the involvement of AI in specialised operations involving the global supply chain. As such, it is imperative for there to be local human capital that caters to industries that are adopting AI into their operations as well as new occupations specialising in AI and the IoT (From personal communication with interviewee no. 1, April 2024), and the Middle Corridor is no exception. In the transportation and storage industry alone, the 4IR is expected to create 27,000 new jobs (Asian Development Bank, 2023). For now, AI awareness in Azerbaijan is low, with an unawareness that AI is already present in their daily lives (Mirbashir oglu & Mammadova, 2023). This low awareness makes up the working-age population whose highest qualification is general education. Surprisingly, the highest level of unawareness comes from Baku. The study by Mirbashir oglu & Mammadova (2023) is further supported by a recent article by EY Azerbaijan that mentions a knowledge gap in working with AI (2024). In fact, the ADB 2023 report showed that only 13% of training institutions provide 4IR courses.

The geopolitical and non-geopolitical causes identified within the scope of this project greatly contribute to the ongoing challenges faced by the Middle Corridor as they involve an

intricate tapestry of regional power-politics (geopolitical) with infrastructure, technology, and transportation (non-geopolitical). The non-geopolitical causes are not just dependent on geopolitics where they concern the country's foreign policy, but also on the country's domestic policy and economic growth plan. Thus, these identified causes will be instrumental to the Port of Baku given its status as a fully state-owned port (Report News Agency, 2021), thus any development in the country's domestic and foreign policies as well as economic growth plan will have direct impact on the Port of Baku.

CHAPTER 3. POLICY ALTERNATIVES

The following policy alternatives are formulated based on interviews with experts as primary data and literature research on port management practices around the world that served as secondary data. Based on the analysis of both data types, the project also considered the Port of Baku's positioning as a strategic location along with Azerbaijan's foreign policy approach. Similar to Chapter 2, the policy alternatives are divided into the geopolitical and non-geopolitical components. The geopolitical components of the policy evaluation are twofold to reflect the two geopolitical causes identified in Chapter 2. The first part, which is navigating the intercultural intricacies of intercultural communication through political advocacy is targeted toward specifically addressing Russia and Iran in the South Caucasus, and to a certain degree, Kazakhstan in the eastern Middle Corridor via political advocacy. As for the non-geopolitical aspects, policies that address the port model, technological advocacy via knowledge and data sharing initiatives, and improving the 4IR workforce will be discussed.

3.1.1 Political Advocacy: Navigating the intricacies of intercultural communication between Iran and Russia

Considering the fact that one of the main concerns for the facilitation of transport is geopolitical as mentioned in the earlier chapters and the fact that Azerbaijan is located in the heart of a complex geopolitical game, the big powers of the region have to be taken into account when ensuring the potential of the country and the Port of Baku as a transportation hub. Azerbaijan's unique geopolitical position also means it has to overcome the difficulty of conducting business with Russia and Iran, which are greatly interested in turning the North-South Corridor into a reality. As Russia and Iran share similar objectives regarding the transportation on the North-South Corridor, intertwining intricate geopolitical dynamics, global commerce, regional power shifts, and national security concerns, necessitating

discussions about the Middle Corridor should acknowledge this broader framework (Mehdizade, 2023).

Iran had criticised Azerbaijan primarily due to fears of border changes in the South Caucasus, which could further weaken Iran's soft power influence, while also reflecting broader regional realignments and evolving global dynamics fostering new alliance formations (Ismayilova, 2023). Azerbaijan had shown its goodwill by allocating \$500 million in the Astara-Rasht rail line of the North-South corridor back in 2016, which was never transferred to the Iranian side due to sanctions (News Central Asia, 2023). At the moment, most of the agreements on the use of the railroad are bilateral, between Russia and Iran, yet the two sides can be considered vocal about their interest in signing trilateral agreements involving Azerbaijan (Kucera, 2023). Since Russia is the most interested party in the development of the North-South corridor due to the Russia-Ukraine conflict, which resulted in the former facing an unprecedented level of sanctions, Azerbaijan's position makes it indispensable for the corridor connecting Russia to Iran. By maintaining its high-level relations with Russia and improving the recently strained relations with Iran, Azerbaijan can use its geopolitical position to ensure that the development of the Middle Corridor is not hindered by the two powerhouses of the region.

3.1.2 Greater Caspian Region – A Mutually Beneficial Regional Policy Approach

The importance of Central Asian countries for the West is on the rise, and both sides appear to be willing to improve trade (Rossi, 2023). However, the most comfortable and convenient itinerary for the nations located in Central Asia is at the moment unusable due to the sanctions faced by Russia (Smagin, 2023). This gives a chance for Azerbaijan to present itself as the only country that can provide a route for resource-rich nations of Central Asia to access the European energy market. In addition, Central Asian nations may also benefit from their own geopolitical locations as the transportation of Chinese goods will also entail their

territories all thanks to being able to trade with the access of Azerbaijan to the Western nations, more importantly Europe itself. In their last meeting, along with improving the relations between the parliaments of their nations, the two leaders, Aliyev and Tokayev, discussed strengthening logistics and transportation cooperation (Satubaldina, 2024).

The two countries would be able to reap the advantages of their geopolitical locations immensely if they concentrated more on the Greater Caspian Region instead of focusing on the countries on the Middle Corridor separately (From personal communication with interviewees no. 2&3, May, 2024.). Since both countries are exporters of traditional energy and are trying to diversify their economies, they would greatly benefit from taking initiatives mutually that focus on the region itself, emphasising the potential of them working together to meet the needs of the European energy market. Considering the fact that both Azerbaijan and Kazakhstan are founding members of the Organisation of Turkic States and former members of the Soviet Union, they can work closely when negotiating with the countries interested in the Greater Caspian Region to facilitate transportation through the Middle Corridor. Azerbaijan and Kazakhstan are already taking several measures to strengthen their relations and increase the importance of the Middle Corridor, with one of them being a joint investment fund (Benson, 2024). An agreement has already been reached between the two countries that an investment of \$300 million will be made to the fund (Daryo, 2024). This is likely to increase the relations between Azerbaijan and Kazakhstan, which are benefitting from being in the family of Turkic States. The concept itself is not new for Kazakhstan, as it also has a similar agreement with the U.S.A. (U.S. Embassy and Consulate in Kazakhstan, 2021). Similar to the joint investment agreement between Kazakhstan and the USA, concentrating on the Greater Caspian Region has the potential of aiding the two linchpin nations to conduct business more freely, without being hindered by their northern neighbour. In his inauguration speech, the president of Azerbaijan, Ilham Aliyev, stated the Organisation of Turkic States held higher importance to

his nation than any other organisation or union to which Azerbaijan is a party (Valiyev, 2024). Likewise, Kassum-Jomert Tokayev has also spoken fondly of Azerbaijanis (Report News Agency, 2024). The interest in accentuating the Greater Caspian Region was also evident in the joint statement given by the leaders of the two countries, where they stated that the Caspian Sea is not a hindrance but a bridge not only between Azerbaijan and Kazakhstan but many more countries (Benson, 2024).

3.2.3-1 Soft Infrastructure: Improvement of the Digitalised Port Model for the Port of Baku

In the previous chapter, it has been discerned that the lack of competent digitalisation contributes to the operational difficulties encountered at the Middle Corridor, particularly at the Port of Baku. Addressing digitalisation is inevitable for large ports, while Alat Port is identified as the biggest port in the Caspian region. According to some service providers, the digitalisation of documents would save 3 days in overall time for Middle Corridor transportation (World Bank, 2023). Digitalisation also gives visibility and reliability to customers, visibility implies that they are tracking their cargo and reliability refers to that they are being punctual in terms of the location of the cargo (From personal communication with PoB, 18 March 2024).

The Alat Port has already employed its digitalisation model called Port Management Information System (PMIS) that includes a Terminal Operating System (TOS) and a Port Community System (PCS) (World Ports Sustainability Program, 2020) in order to achieve its strategic goal of being a smart port in the region with a target of 90% capacity for automation. This system manages cargo information, gate in/out information, loading and discharging, yard stacking information, and more. But still grapples with reducing manual work and eliminating operational errors in specific tasks. However, the extent of automation has only reached 50%,

well below the envisioned threshold (Ministry of Economy and Finance of the Republic of Korea, 2019).

In order to realise this objective, a careful evaluation of the existing system's errors and the viability of information sharing needs to be meticulously examined. Thus, improvement of the current digital system of the Port of Baku is recommended in three areas (1) all cargo handling can be computerised which is essential for decision-making regarding terminal operations (2) delays in cargo handling can be prevented by receiving all cargo information before the vessels or rails arriving which will empower Port of Baku to prearrange all required labour and equipment resources (3) digitalisation of weighbridge in terms of amalgamation of weight data with the corresponding cargo number or wagon identification can reduce the delays (Ministry of Economy and Finance of the Republic of Korea, 2019).

Through the implementation of an upgraded automated TOS, the Port of Baku can achieve its relative full automation goal, which is also done by the Busan New Port in Korea by the name of BPA-NET. With this system, the Busan Port built an integrated management system connecting national and other parties, reinforced pertaining services (vessels, trucks, and rails) connected with the information, and established a customer-oriented one-stop service to increase the traceability and visibility of cargo. Consequently, automated TOS in Busan effectively helped in its transformation to a smart port (Ministry of Economy and Finance of the Republic of Korea, 2019). To be noted, considering the elimination of the digitalisation challenges and negative externalities in the port operations, the TOS is highly preferable in terms of reducing costs and time of cargo (Paddeu et al., 2019).

As a course of further action, it is suggested that the Port of Baku can forge partnerships with international organisations in implementing human resources strengthening initiatives to enhance both automation and operational efficiency (From personal communication with PoB, February 13, 2024). This initiative will equip the port employees to adapt themselves to new

technological advancements and easily interact with robots and virtual realities (Vaggelas & Leotta, 2019). Moreover, to guide port digitalisation efforts effectively, the Port of Baku needs to visit, analyse, and benchmark more advanced ports to reach its ultimate goal of being a strategic trade hub in the region. Moreover, to see the big picture within the context of Middle Corridor, after the implementation of a fully digitalized system, the Port of Baku Authority can exacerbate the extensive connectivity with other stakeholders along the corridor and enhance its studies in the application of other required systems such as warehouse management, vehicle traffic management, terminal traffic control and management, and so on. Among all, the Port of Baku can exchange its experience with other stakeholders, especially the Port of Kuryk in Kazakhstan which is a linchpin in the Middle Corridor that will be discussed below.

3.2.3-2 Soft Infrastructure: Knowledge and Data Sharing Initiatives between the Port of Baku and Kuryk Port

Knowledge and data sharing became the approach of two medium-sized seaports in Europe as a way of improving flow of goods and increase efficiency (Port Technology Team, 2022). The Port of Gothenburg in Sweden and North Sea Port in the Netherlands adopted the practice with the former sharing its knowledge in energy management with the latter. The five-year partnership agreement also included employee exchange program (Ferry Shipping News, 2022). Another case is the knowledge sharing between Sohar Port and Port of Rotterdam Authority (Hellenic Shipping News, 2020). Sohar Port lacked the expertise and knowledge in port operations and strategy. Once Sohar Port has developed to a level of maturity, its knowledge and expertise specific to the port was also transferred to Port of Rotterdam Authority.

This approach can be adopted between Port of Baku and the ports of Kazakhstan, particularly Kuryk Port. Kuryk Port is moving towards increasing its export to support Port Aktau (bne IntelliNews, 2023), thus knowledge-sharing enables Port of Baku to impart its

expertise and knowledge in the digital aspect such as PMIS, given that digitalisation and automation are the port's priority (World Ports Sustainability Program, 2020), which could not just benefit Port Kuryk in its port operation, but also improve the digitalisation process of the Middle Corridor and thus, addressing the digitalisation challenges as identified in Chapter 2. To be noted, the same policy is also viable to be adopted towards Georgian ports as well. Another area of knowledge sharing includes cybersecurity measures to secure the IT infrastructure from threats, which could reduce the corridor's vitality (Almeida, 2023). This particular policy will also complement its motto as the "hub in Eurasia" while taking the exemplary lead in the digital transformation among the ports in the Caspian Sea.

3.2.4 Soft Infrastructure: Towards a 4IR-Ready Workforce

To address the digital gap in the workforce as identified in Chapter 2 there needs to be concrete efforts in preparing the existing and future workforce for occupations that meet the demands of the 4IR. Otherwise, it will have an impact on the nation's economic development and prosperity. This is crucial since the transport and storage industry is of vital importance to Azerbaijan's employment and development (Asian Development Bank, 2023). However, the report by ADB also revealed that only 20% of transportation and storage firms are familiar with 4IR technologies. Supplementing this with the 2023 study by Mirbashir oglu & Mammadova (2023), they both compel the need for there to be a 4IR-ready workforce if Azerbaijan is to catch up with the digitalisation changes occurring in the global supply chain and logistics industries that will have an impact on the Middle Corridor.

One national initiative is the establishment of the C4IR which involves cooperation with international organisations in emerging technologies (C4IR, n.d.). On an education level, programs targeting 4IR technologies should be promoted in schools and educational institutions to increase awareness and build confidence in learning about 4IR technologies in general and AI specifically. Careers pertaining to 4IR technologies at the Port of Baku can also

be promoted to students to highlight the diverse application of 4IR technologies in this rapidly changing world. These careers require ICT and digital skills, as well as creative thinking and design skills (ADB, 2023). Additionally, the Port of Baku and other companies and firms in the transportation and storage industry could cooperate with educational institutions in cultivating and training students for these occupations requiring such skills. This is a form of CSR and advocacy work for the Port of Baku and the companies and firms involved. To date, there are existing robotics and coding programme offered to students, which will develop their technical skills (Euronews, 2024). Such programmes can be delivered in short time periods in the form of workshops that will expose young students to 4IR technologies. Longer courses during the summer can be offered to high school students. Both approaches will aim at building the students' knowledge of 4IR technologies as well as their collaborative and thinking skills (Borrageiro & Mennega, 2023). As for the existing workforce, upskilling is an approach that can be done at the workplace with a specialised curriculum. Singapore for instance has Continuing Education and Training (CET) programme which is part of the country's SkillsFuture policy that aims at maximising the potential of its citizens (Osman, 2023). In Denmark, CET is provided to non-professionals, managers, executives, and technicians (non-PMETs) with strong cooperation between the industry and the education system. Meaning that in Denmark's case, there exist educational consultants that will identify the needed training of existing workers that will meet the industry demands. These workers are then given opportunities to match with educational centres for training. Such a method can be carried out at a pilot level for the Port of Baku in identifying the skills and training of its existing workforce and working closely with educational centres to meet the 4IR needs.

The policy options provided address some of the geopolitical and non-geopolitical challenges identified in Chapter 2. They are meant to strengthen Azerbaijan's position in

regional geopolitics through its prestige, strategic location, and carefully curated foreign policy that is not just to Azerbaijan's benefit, but also the vitality of the Middle Corridor.

CHAPTER 4. EVALUATION OF POLICY ALTERNATIVES

The research problem of the project investigates what are the significant geopolitical and non-geopolitical challenges that impede the attractiveness of the Middle Corridor as a viable trading route. Five causes have been identified, with two falling under geopolitical challenges and three under non-geopolitical challenges. The project proposes five policy alternatives that address some of these challenges. Chapter 4 is devoted to the evaluation of all policy alternatives in Chapter 3 based on the five criteria: effectiveness, efficiency, feasibility/implementability, equity, and flexibility/improvability.

4.1.1 Political Advocacy: Navigating the Intricacies of Intercultural Communication between Russia and Iran

Firstly, Azerbaijan's strategic location between Europe and Asia makes it a crucial player in establishing *effective* trade routes. By supporting the North-South corridor, Azerbaijan can enhance connectivity between Northern Europe and the Indian Ocean, facilitating the movement of goods and reducing transportation costs and time. Moreover, the North-South corridor offers a more direct route for trade between Europe and Asia, bypassing traditional routes that are longer and more circuitous. Azerbaijan's support for this corridor can streamline transportation processes, reducing logistical complexities and improving overall *efficiency* in trade operations, satisfying the need for such a route in Iran and Russia. Azerbaijan has demonstrated its commitment to infrastructure development and regional cooperation through initiatives like the Baku-Tbilisi-Kars railway and the Baku International Sea Trade Port. These efforts indicate the *feasibility* of Azerbaijan's involvement in the North-South corridor. Additionally, supporting the North-South corridor aligns with Azerbaijan's commitment to promoting *equitable* economic development and regional integration. By providing a more accessible and efficient trade route, Azerbaijan can contribute to reducing disparities in trade opportunities among participating countries. Azerbaijan's support for the

North-South corridor offers flexibility in trade routes, providing alternative options for countries seeking to diversify their transportation networks. This *flexibility* enhances resilience in the face of geopolitical challenges or disruptions along other routes.

4.1.2 Greater Caspian Region – A Mutually Beneficial Regional Policy Approach

To begin with, by concentrating on the Greater Caspian Region, Azerbaijan and Kazakhstan can pool their resources and expertise to address common challenges and capitalize on shared opportunities. This coordinated approach can enhance the *effectiveness* of regional initiatives and projects, leading to greater economic growth and stability. On top of that, focusing on the Greater Caspian Region allows Azerbaijan and Kazakhstan to streamline their efforts and resources, avoiding duplication of initiatives and maximizing *efficiency*. This shared approach enables them to achieve economies of scale in trade facilitation and investment promotion. Membership in the Organisation of Turkic States enhances the *feasibility* of joint efforts between Azerbaijan and Kazakhstan by providing a structured framework for multilateral cooperation. The organisation serves as a platform for dialogue and coordination among member states, offering opportunities for Azerbaijan and Kazakhstan to engage with other Turkic-speaking countries in the region and beyond. Emphasising their membership in the Greater Caspian Region and Organisation of Turkic States emphasize the shared identity and values that Azerbaijan and Kazakhstan possess, promoting a sense of *equity* and solidarity among member states. This common bond can foster a collaborative approach to addressing regional challenges and opportunities. Furthermore, emphasising the Greater Caspian Region provides *flexibility* for Azerbaijan and Kazakhstan to adapt to changing geopolitical dynamics and economic trends. By diversifying their partnerships and engagement beyond traditional alliances, they can mitigate risks associated with overreliance on any single country or region.

4.2.3-1 Improvement of the Digitalised Port Model for the Port of Baku

Improvement of the digitalized port model policy for the Port of Baku can be *effective* because the Port of Baku can address its obstacles in being a fully smart and sustainable port in the region and take necessary steps to develop information sharing and intelligent systems. It will manage congestion, provide business value and competitiveness, and enhance the quality of service. To be *efficient*, this policy can improve productivity and reduce costs and time of cargo handling that lays the ground for the traceability and visibility of cargo and the quality decision-making concerning operations. Employing this policy in Port of Baku involves significant upfront costs, including software development, installation, training, and maintenance, but can lead to long-term cost savings by reducing manual labour, and resource wastage, as well as mitigating risks associated with operational distributions. When it comes to *equity*, the policy of improving digitalisation in Port of Baku will ensure that the benefits and opportunities are accessible and equally distributed among all integrated stakeholders in the port, while also addressing the interoperability issues and standardization challenges to ensure that the digital system is compatible and available to all participants in the supply chain network. From the perspective of environmental and social impact, this policy demonstrates a green infrastructure and does not harm the communities. Moreover, this policy is technically and operationally *feasible*. Because it is compatible with the Port of Baku's existing infrastructure, systems, and technologies, even though the port Authority already included this policy in their vision to be accomplished soon. Finally, our assessment of *flexibility* shows that the policy remains effective and relevant over time because it proposes further required digitalisation systems for the Port of Baku. The policy can adapt itself to evolving regulatory requirements, even open for regular monitoring and revisions to incorporate new developments and best-case studies in the area of smart ports.

4.2.3-2 Knowledge and Data Sharing Initiatives

Knowledge and data sharing initiatives will be highly *effective* as they involve improvement in cargo flows and *efficiency* in operations. In terms of *feasibility*, there will be concerns about trust and control issues when it comes to sharing data and knowledge on a transnational level. There may also be different goals between the Port of Baku and ports in Kazakhstan. This policy also requires cooperation in terms of an agreement, partnership, or a joint-venture, depending on the level of involvement each party wants to be involved. Thus, *feasibility* will be a major issue to be considered when implementing this policy measure. In terms of *equity*, this policy mutually benefits both sides in terms of operability and efficiency, as seen in the case of Port Sohar and Port Rotterdam, and North Sea Port with Gothenburg Port. There is a high degree of *flexibility* as the knowledge and data sharing can also be done with other ports located in the Caspian Sea region or even with other ports outside of the region, thus improving the vitality and efficiency of the Middle Corridor.

4.2.4 Towards a 4IR-Ready Workforce

This particular policy measure will be highly *effective* as it targets the operation level and addresses the digital gap in terms of creating skilled human capital for the future. It also has high *efficiency* as it involves local talent without having the need to rely on foreign talent. *Feasibility* requires the involvement of multiple parties from the Port of Baku to government, schools, universities, colleges, and educational institutions. Thus, it is feasible on a small-scale but also needs to be implemented on a national scale, which requires involvement of multiple parties. The policy also has high *equity* as it equips the future generation for skilled jobs of the future and upskilling the existing workforce which overall improves the high-skilled workforce within the country. Learning from the research conducted by Mirbashir oglu, & Mammadova (2023), a future-ready workforce complements Azerbaijan's digital strategy and addresses the

digitalisation challenges. In terms of *flexibility*, the program can be tailored to meet the current and upcoming changes and developments in 4IR technologies within Azerbaijan.

Policy Options/ Criteria	Effectiveness	Efficiency	Feasibility	Equity	Flexibility
Political Advocacy: Navigating the Intricacies of Intercultural Communication	✓	✓	✓	✓	-
Greater Caspian Region	✓	✓	✓	✓	✓
Improvement of the Digitalised Port Model for the Port of Baku	✓	✓	✓	✓	✓
Technological Advocacy: Knowledge and data sharing between Port of Baku and Kuryk Port	✓	✓	-	✓	✓
4IR-ready workforce	✓	✓	✓	✓	✓

The five policy alternatives proposed are meant to address the geopolitical and non-geopolitical challenges faced by the Middle Corridor in the context of Azerbaijan and the Port of Baku. These policies are as follows: political advocacy through intercultural communication, promotion of a Greater Caspian region, improvement of the digitalised port model, technological advocacy via knowledge and data sharing, and preparation for a 4IR-ready workforce. Three policy alternatives are deemed as the most appealing, which are: the Greater Caspian region policy, technological advocacy, and improvement of the digitalised port model. Firstly, a unified approach to the Greater Caspian Region holds the potential of the two linchpins of the Middle Corridor, Azerbaijan, and Kazakhstan, may mitigate the issues of the

corridor and help the two countries participate more effectively in negotiations from both the East and the West. Regarding technological advocacy and improvement of the digitalised port model, they are chosen because they can be carried out in a much more scalable manner and are interrelated. For instance, should the Port of Baku continue with improvement to its port model, this strategic organisational level approach will complement the technological advocacy policy that goes to a transnational level. Thus, these two policies address not just the digital challenges but also work toward improving the geopolitical challenge by way of cooperation among nations. This local approach but with a transnational outlook serves to benefit not just the Port of Baku, but Azerbaijan and effectively the Middle Corridor. It has the potential to place Azerbaijan as a leader in the region when it comes to digital transformation, serving as a successful case study for other similar ports to emulate.

CHAPTER 5. RECOMMENDATIONS AND CONCLUSION

The final chapter provides our recommendations on the policy alternatives that have been formulated and outlines key findings by a comprehensive conclusion. This project sought to investigate what are the challenges along the Middle Corridor in making it a vital trading route. We looked at global practices and analyses by experts. The findings revealed that there are geopolitical and non-geopolitical factors that greatly impact the vitality of the Middle Corridor. Firstly, is Russia's relations with countries in the South Caucasus as well as Iran. Second is Kazakhstan's role in the South Caucasus's geopolitical landscape as the linchpin in the eastern component of the Middle Corridor. The non-geopolitical causes include challenges in hard and soft infrastructure along the Middle Corridor. Challenges in hard infrastructure are found in ports and maritime, as well as the railway sector. Soft infrastructure deals mostly with digitalisation challenges that also include a workforce able to meet the demands of the 4IR.

The formulated policy alternatives address these challenges in their own unique ways. The Greater Caspian region policy particularly in Azerbaijan increased prestige after the liberation of Karabakh and restoration of its territory and sovereignty. The non-geopolitical aspects can be dealt by an improvement of the digitalised port model for the Port of Baku, promotion of knowledge and data sharing, as well as the creation of a 4IR-ready workforce.

Recommendations

Relying on our primary and secondary data sources, in order to manage the geopolitical and non-geopolitical challenges faced by the Middle Corridor in the context of the Port of Baku, the following recommendations must be applied:

1. The technological context of trade evolving promptly, and ports must always be ready for adaptation. In doing so, the Port of Baku needs to establish key performance indicators (KPIs) to monitor port efficiency and follow progress towards operational objectives. Continued monitoring and evaluation enable the port to identify

areas of improvement and apply the best course of action to optimise efficiency and effectiveness. It is also recommended to establish specific consultative bodies by the Port of Baku – these bodies can consult the Port of Baku in various interested areas, such as information sharing systems, automation of operations, and so on. Among that, a group of experts including engineers, economists, competent port representatives, and stakeholders may be helpful in facilitating the identification of discrepancies in port performance. As the digitalised port model is underway, it should complement the technological advocacy that will be applied to a transnational level.

2. Continuing Azerbaijan’s political advocacy by navigating the intricacies in the intercultural communication of the South Caucasus region with Russia as the longstanding presence in the north, Kazakhstan in the eastern Middle Corridor, Türkiye in the western Middle Corridor, and Iran in the south. Greater attention should be given to deepening economic ties with Kazakhstan with a focus on the Greater Caspian Region thanks to strongly established relations with the help of the Organisation of Turkic States that will facilitate transportation in the Middle Corridor. Furthermore, Azerbaijan should develop confidence-building measures in engaging with other stakeholders. The popularity of a port depends on to what extent other parties trust in its performance. In this way, the port will receive more cargo and maximise its profit accordingly.

3. Working towards a 4IR-ready workforce that serve to equip Azerbaijan with the high-skilled workforce that it needs to fill the employment opportunities requiring human capital that are knowledgeable in the 4IR. Taking into account the examples of Denmark and Singapore, a CET programme by the Port of Baku can be created and promoted to its existing workforce at a pilot level. This programme should consider the trainees’ schedule, needs, and skills, and offer the programme to its

targeted employees since they are rarely the ones to seek and enroll into the training programme themselves. Upon the success of the pilot programme, further close cooperation between the Port of Baku and education centres such as universities and schools will serve to accommodate the CET programme on a wider scale. This is also a step towards increasing the organisation's brand awareness among students in these education centres.

4. To enhance the attractiveness of the Middle Corridor and Port of Baku, it is recommended to combine short-term efficiency gains achieved through better coordination, logistics, and digitalisation with medium-term investments.

Concluding Remarks

The geopolitical and non-geopolitical challenges surrounding the Middle Corridor do impact the vitality of the corridor, but we believe the proposed policies can exert real and tangible outcomes that will benefit not just the Port of Baku, but also Azerbaijan's future. The Port of Baku positions itself as the hub in Eurasia. Given the policy measures provided, they will increase the importance of the Port of Baku in the long-term by becoming an example for other ports in the Caspian Sea through the improvement of the digitalised port model and knowledge and data sharing. This will add to the credibility of Azerbaijan as a country that has emerged victorious from the war as it continues to lead the way in modernisation and development, thus improving stability in the South Caucasus and consequently, increasing the importance of the Middle Corridor.

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Appendix



Consent Form for Interview

- I _____ voluntarily agree to participate in this interview for a capstone project.
- I understand even with my agreement to participate, I can withdraw at any time or refuse to answer any question without any consequences of any kind.
- I understand that I can request for the data used from my interview to be withdrawn within a week after the interview.
- I have been briefed about the nature and purpose of the capstone project.
- I have been given the opportunity to ask questions about the study.
- I understand that participation in the interview involves audio recording, to which I agree.
- I understand that all of my information will be kept confidential.

Signature: _____

Date: _____