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International North–South Transport Corridor: Boosting Russia's "pivot to the South" and Trans-Eurasian connectivity

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Abstract

The Russian economy will have to adjust its logistics to face the new reality. The operationalization of the multimodal International North–South Transport Corridor (INSTC) is an important strategic part of it. This "pivot to the South" by Russia and other Eurasian Economic Union (EAEU) countries is of particular significance in light of the required reconfiguration of supply chains in Eurasia. Russian exporters, importers and freight forwarding companies' needs in alternative logistical opportunities have increased dramatically. The INSTC development would promote Eurasian intra- and transcontinental connectivity, reduce export costs, develop new production niches, and realize the Caspian region's transit potential. This study estimates that the aggregate potential INSTC freight traffic via all the routes and modes of transport, including containerized and non-containerized cargoes, will reach 15–25 million tonnes by 2030. The container traffic could rise 20x and this will require investments in hard infrastructure and also soft infrastructure improvement. The corridor will contribute to the evolving outline of the trans-Eurasian transport backbone and bring significant benefits for the economies of Russia, Central Asia, the Caucasus, Middle East, and South Asia.

Keywords: International North–South Transport Corridor, INSTC, supply chains, trans-Eurasian transport backbone, international trade, international logistics, Eurasia, Caspian Sea.
JEL classification: F15, F17, L92, O19, R11, R41.

1. Introduction

The theory views the development of international transport corridors (ITCs) as a key tool to expand trade and economic cooperation between countries. According

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to several international studies, establishment of international transport corridors makes it possible to enhance freight traffic management, improve laws and regulations, implement aligned border-crossing procedures, attract infrastructure investments, and increase the efficiency of state–business interactions (World Bank, 2011). In the context of Eurasian connectivity, the development of transport corridors enables the rational utilization of national transit capacities, promotes localization of industrial production along their routes, enables expansion of exports, and strengthens the connectivity of intracontinental states and regions (Vinokurov et al., 2018). Transport corridors are particularly important for landlocked countries. Resolution 74/15 adopted by the UN General Assembly on 5 December 2019 after the High-Level Midterm Review on the Implementation of the Vienna Programme of Action for Landlocked Developing Countries for the Decade 2014–2024 (UN, 2019) recommends that landlocked developing countries (LLDCs) and transit countries consider a corridor approach to improve trade and transit transport. Transport corridors are critically important for the Eurasian Economic Union (EAEU): four of the five member states of the Union are landlocked.

Unlike Europe and East Asia, the density of international transport routes in the heart of Eurasia is not particularly high (although it is certainly a developed system in terms of international comparisons). It is especially true in regard to meridional linkages. In contrast to several East–West routes, the INSTC is the only one meridional transcontinental corridor in the EAEU. At the other end, for the rapidly growing economy of India, the INSTC could be the land-based corridor of choice for efficient trade with Russia and Central Asia.

The INSTC is a multimodal network of sea, rail and road routes. It connects the north-western part of Europe and the Nordic countries to the countries of Central Asia, the Persian Gulf, and the Indian Ocean (Vinokurov et al., 2009). The idea of establishing transport routes between India and Europe across the territory of Russia was initially discussed at the end of the 19th century (Migulin, 1903). At that time, the Russian Empire was interested in accessing the Indian Ocean by expanding railway networks to India through Afghanistan and Persia.

The legal basis for creating the corridor was established after the Inter-Governmental Agreement on the International North–South Transport Corridor ("the Agreement") was signed by three countries — the Republic of India, the Islamic Republic of Iran, and the Russian Federation. The event was held in St. Petersburg on September 27, 2000, during the Second International Eurasian Conference on Transport. Following the Agreement's ratification by all three parties, it came into force on May 16, 2002. Since then, Kazakhstan, Belarus, the Sultanate of Oman, Tajikistan, Azerbaijan, Armenia, and the Syrian Arab Republic have become members, while Bulgaria has been an observer.

The multimodal International North–South Transport Corridor connects the north-western part of Europe and the Nordic countries with Central Asia and the Persian Gulf (Fig. 1). This corridor should facilitate the shift of freight flows from sea routes passing through the Suez Canal and Gibraltar, to Eurasian land and multimodal routes.

The INSTC has not gained as much traction as the existing Eurasian corridors Transsib and TRACECA, given sanctions imposed on Iran and bottlenecks in the transport infrastructure. However, over the last several years, the active interaction of the EAEU member states with India and Iran, as well as a better regulatory environment around the Caspian Sea, drove its development.

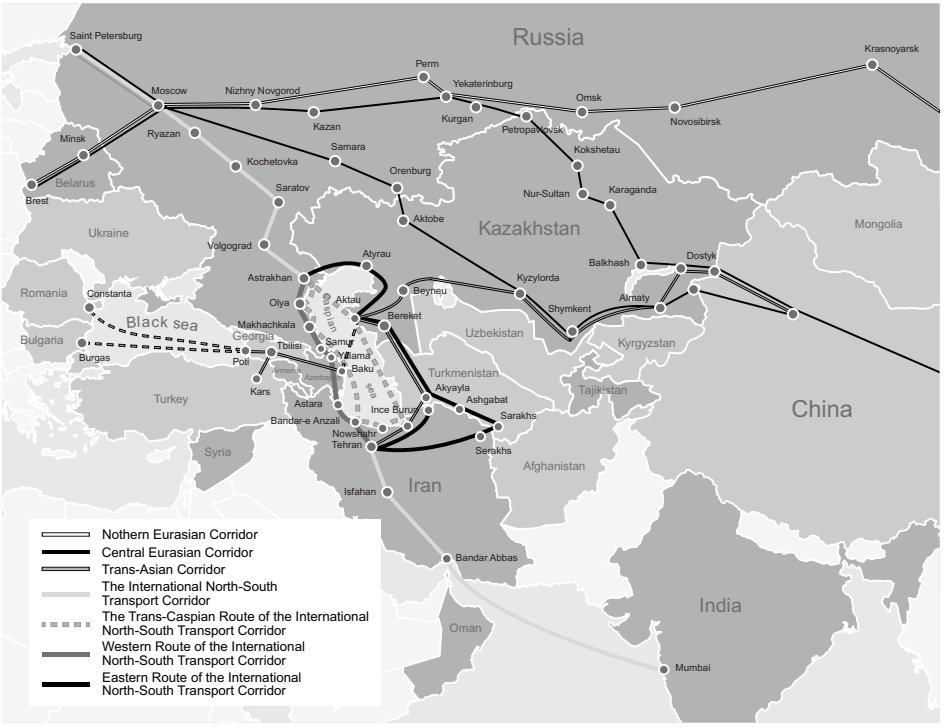

Fig. 1. INSTC — Meridional corridor of the Eurasian transport backbone.

Source: Eurasian Development Bank.

The importance of INSTC as an alternative transport route for international trade in unforeseen situations was reaffirmed by the incident in the Suez Canal on 23 March 2021, when a container ship under the Panamanian flag ran aground and blocked all traffic between the Red Sea and the Mediterranean Sea. It caused a global failure to meet liner shipping and cargo delivery schedules, a rapid increase in freight rates, and growing uncertainty regarding the logistical chains of goods delivery between Europe and Asia. Of course, the INSTS will not be able to completely replace the entire cargo flow through the Suez Canal, but the establishment of an alternative for 5–10% of the total volume will also be very important for smooth transport operations.

Today, the EAEU's pivot to the South and prompt operationalization of the INSTC are of particular significance in light of the abrupt global geopolitical shifts and required reconfiguration of freight transport supply chains in Eurasia due to the Ukrainian crisis. In the context of serious Western sanctions and EU countries' blockage for road transport of their land border with two EAEU members — Russia and Belarus — the whole of Eurasia faces a huge challenge of reconfiguring logistics and supply chains. Many rail-freight routes coming from China transit through Russia and Belarus on their way to Western European destinations, so all Eurasian actors are searching for alternative routes, at a time when the containerized shipping sector is still besieged by port congestion, shipping delays, and container shortages, resulting in extensive delays and record-high freight rates (Millar, 2022). In this context the INSCT's launch is a key solution, particularly for the EAEU and Central Asian countries, for

trade expansion with India, Iran, Turkey, and other countries of South Asia and the Persian Gulf.

One of the main advantages of the INSTC compared to the other transport routes, including the deep-sea route via the Suez Canal, is the significant reduction of cargo delivery time. For example, it takes 20 to 45 days to deliver cargo from Mumbai for inland points of destination via the ports of St. Petersburg or Novorossiysk by the traditional route through the Suez Canal, while INSTC route delivery time may vary from 15 to 24 days. Moreover, using the Eastern corridor route that runs through Kazakhstan and Turkmenistan can reduce delivery times to 15–18 days. It becomes even shorter after operationalization of the Astara–Rasht railway section in Iran. Reduced delivery time is critical for many products such as food, textiles, household appliances, and electronics. Higher capital turnover rates are critical for manufacturers of expensive goods transported in containers. INSTC freight costs remain relatively high, despite the fast delivery. The rate charged by RZD Logistics JSC — one of the INSTC's logistics operators — for the delivery of a twenty-foot equivalent unit (TEU) from the port of Nhava Sheva (India) to the freight village of Vorsino (Kaluga Region, Russia) via the INSTC can be used as a benchmark ($2,650, assuming a round trip[1]). By comparison, before the COVID-19 pandemic, maritime freight rates charged for delivery of similar cargoes through the Suez Canal were about two times lower, ranging from $1,000 to $1,200. However, transformative digital technologies can reduce the expenses of cargo owners and make the INSTC competitive with the traditional deep-sea routes (Vinokurov et al., 2021).

Railways, as the preferred mode of transport along the corridor, are environmentally friendly. The average direct and indirect greenhouse gas emissions generated by railway transport are 18 g/tonne-kilometre (tkm), which is only marginally higher than the transport used for long-distance maritime freight (12 g/tkm). Railway transport produces half the emissions of inland water transport, seven times less than road transport, and 30 times less than air transport per tkm. By considering emissions of greenhouse gases, particulate matter, and nitrogen oxides, which also have harmful effects on the environment and human health, railway transport can be safely described as the undisputed leader in environmental performance.

The INSTC can make an essential contribution to the implementation of multilateral initiatives and programmes, such as the Vienna Programme of Action for Landlocked Developing Countries for the Decade 2014–2024, and the UNESCAP Regional Action Programme for Sustainable Transport Development in Asia and the Pacific (2022–2026). The INSTC will provide an essential impetus to achieving Sustainable Development Goals (SDG), UN General Assembly resolutions on sustainable transport and transit transport corridors, and recommendations of two global UN conferences on sustainable transport held in November 2016 in Ashgabat and in October 2021 in Beijing.

This paper aims to identify potential containerized and non-containerized freight traffic with a goods nomenclature and to quantify synergies arising from interlinking the INSTC and the Eurasian east–west transport corridors. The additional aim is to introduce a new concept of the Eurasian transport backbone and

[1] https://www.rzdlog.com/services/international_transit/

to identify its benefits for the LLDCs in Eurasia. Section 2 reviews the studies and researches regarding the corridor and its economic consequences and assessments. Section 3 outlines methodology and data sources. Section 4 highlights the INSTC development, explores the Eurasian transport backbone, and assesses the potential of cargo flows through three INSTC's routes. The existing bottlenecks in the transport and logistics infrastructure are presented in Section 5. Section 6 puts the INSTC into the framework of the evolving (and rapidly changing) trans-Eurasian connectivity. The final section concludes the study.

2. Literature review

The INSTC has been the subject of several studies by international organizations and various researchers.

Research by international organizations (UNECE, 2012, 2020; UNESCAP, 2017, 2019) explores the possibility of integrating the INSTC into existing international transport corridors' architecture and Euro–Asian transport linkages. These studies provide technical details revealing the configuration of the transport routes of the participating countries and the correspondence of the INSTC railway routes to other major Eurasian routes and networks, including Pan-European transport corridors and Organization for Cooperation of Railways (OSJD) corridors. The main interest of these studies is their exploration of the particular role of transport corridors for Eurasian landlocked developing countries (LLDCs). LLDCs and transit countries should make additional efforts to reduce delivery time along the corridors and to adopt an integrated approach to the management of international transport corridors, to avoid duplication of efforts, promote regional connectivity, achieve Sustainable Development Goals (SDGs), and maximize the associated economic opportunities.

Vinokurov et al. (2021) look at potential INSTC freight traffic and lay down the concept of the Eurasian transport backbone. Using the gravity model, this report demonstrates a vast trade potential, subject to achievement of seamless transport routes, improvements in the quality of the transport infrastructure, and digitalization. With a global drive for decarbonization under way, the report also assesses favorably the INSTC carbon footprint, which is comparable with that of deep-sea maritime transport.

Among the most important are technical "dry run" reports based on the physical movement of containers with cargo along different INSTC routes. These pilot studies, conducted by the Federation of Freight Forwarders' Associations of India (FFFAI) in 2014 and 2017 (FFFAI, 2014; Dayal, 2019), included details on issues faced by the importers/exporters/logistics providers and other stakeholders involved in the movement of cargo to Russia/CIS and the possibility of diverting it onto the INSTC route. In 2021 RZD Logistics JSC and the Finnish logistics operator Nurminen Logistics Services OY jointly piloted container transportation on the INSTC western route (Tsots, 2021). Pilot-run reports are the source of many technical and technological parameters for the corridor feasibility assessment.

Considering the geopolitical component in transborder connectivity issues in Eurasia, we should distinguish a separate block of in-house geostrategic research. These studies examine eventual benefits and risks for each participant in the INSTC agreement and regional blocks' viewpoints. For example, for

Russia — Karavayev and Tishehyar (2019), Otorbaev et al. (2021), Sushentsov et al. (2019), Volodin and Volodina (2019); for India — Sarma and Menezes (2018); for Iran — Farhat (2018); at the regional level — Contessi (2020). Such geostrategic research stimulates expert discussion about the parties' interests in the changing global transport industry and emerging geopolitical risks.

The technical and geostrategic research results are the basis for many other studies analyzing various aspects of the INSTC. In sum, these studies, situated at the intersection point, contribute to the popularization of the INSTC initiative in business, political, and academic environments.

A review of the literature shows that there is scarce research on the INSTC that integrates all technical, technological, developmental, geostrategic, practical, and popularising aspects. In the context of active interaction of the EAEU with India and Iran within the scope of the Greater Eurasia concept over the last several years, there is a need for research that would identify the advantages of the corridor in terms of cost and time and place it within a wider framework of trans-Eurasian connectivity.

3. Data and methodology

For this study, we collected secondary data from the United Nations Comtrade Database, the Eurasian Economic Commission, the European Statistical Agency (Eurostat), as well as national customs services, railway companies, and state maritime and inland water transport authorities.

We performed an integrated three-stage expert assessment of the aggregate INSTC freight potential, including containerized and non-containerized cargoes. This approach follows a standard procedure used in transport economics. The first stage assessed the containerization potential of both existing and possible freight traffic for all trading pairs of countries along the three INSTC routes. The basis for calculations is the existing volumes of trade (in metric tons) for the key commodity items — food, metals, construction materials, fertilizers, machinery and equipment, wood and wood products, textiles, etc. A scenario-based container freight traffic forecast was prepared using foreign trade and cargo flow matrices designed for each pair of countries that can benefit from using the INSTC routes: six EU member states (Finland, Germany, Poland, Latvia, Lithuania, Estonia), Belarus, Kazakhstan, Russia, Azerbaijan, Turkmenistan, Iran, India, Pakistan, and Oman (hereafter — the main countries). The second stage measured the potential container freight traffic generated from the synergies between the INSTC routes and east–west Eurasian latitudinal transport corridors, particularly the TRANSSIB and TRACECA (first of all, Russia — Turkey and China — Iran directions). The final stage computed the transportation potential of non-containerized cargo, based on assumptions regarding the dynamics of international trade and the current state of relevant industries. These include grain, vegetable oil and some other goods. The forecast excluded cargo that could not be switched to the INSTC for a number of reasons (tariffs, economic feasibility, technological limitations). Cargoes excluded from calculations are coal, petroleum products, liquid chemicals, etc.

Following the three-stage expert assessment, baseline and best-case scenarios until 2030 were developed. The baseline scenario envisages moderate freight traffic growth along the INSTC routes based on the expectations regarding the pace

of post-pandemic global economic recovery and trade expansion in the main countries. From a geopolitical perspective, it is expected that the sanctions against the Islamic Republic of Iran will remain or ease slightly. In addition, we assumed that the maritime freight rates would return to the pre-pandemic level after 2022 at $900–1,200 per TEU, whereas we fixed an average railway freight rate at $3,500 per TEU in both scenarios. Finally, the share of containerized cargoes remains constant throughout the forecasted period. All calculations were based on the market environment at the end of 2021.

In the best-case scenario, the global economic recovery rate and trade flow expansion in the main countries are expected to be higher than in the baseline scenario. It also assumes that the sanctions against Iran will be substantially relaxed, positively affecting Iranian trade with the European countries. Furthermore, granting Iran full membership in the Shanghai Cooperation Organisation in 2021 might decrease Iran's international isolation and improve trading relations with the key INSTC players — the Russian Federation, India, and China. Moreover, maritime container freight rates are expected to decline over the medium term, as the epidemiological situation in the world returns to normal. However, because of the anticipated intensification of foreign trade, those rates will not return to the pre-pandemic level and exceed those used in the baseline scenario. Under the best-case scenario, the containerization rate of cargo is expected to grow until 2030.

4. Assessment of the INSTC's freight traffic potential

The INSTC has three main routes, which are different in length, mode of transport, level of development of main and ancillary infrastructure. These routes, all starting from the Russian-Finnish border and the port of St. Petersburg to the port of Bandar Abbas, Iran's main export port on the Persian Gulf, are as follows (see Fig. 1):

- the "Western" Route along the western coast of the Caspian Sea through Russia and Azerbaijan, is approximately 5,100 km, with the best connections to railway and road networks of the South Caucasus;
- the "Trans-Caspian" Route, which uses ferry and feeder container lines across the Caspian Sea, is approximately 4,900 km;
- the "Eastern" Route along the eastern coast of the Caspian Sea through Kazakhstan and Turkmenistan, is approximately 6,100 km.

The operationalization of the meridional INSTC creates opportunities to link up with transport corridors running from east to west. That enables the development of a Eurasian transport backbone, a network of interconnected international east–west and north–south transport corridors in Eurasia. Such a backbone generates additional freight flows through synergies from interlinking transport corridors and provides landlocked countries with access to markets. It should be noted that landlocked countries experience weaker growth than countries with access to the sea, with average growth of the former being about 1.5 percentage points less (Arvis et al., 2010). The Eurasian transport backbone will help to reduce delivery time along the corridors by avoiding duplication of efforts, promote regional connectivity, and maximize the associated economic opportunities.

It would be wrong to say that the INSTC has not yet been used for international traffic. In some sections of the corridor, cargo flows are already significant.

In particular, the annual traffic volume in 2020–2021 amounted to:

- Russia–Azerbaijan — approx. 6 million tonnes, incl. 10,000 TEUs by rail;
- Russia–Azerbaijan — more than 1 million tonnes by road transport;
- Russia–Georgia (transit via Azerbaijan) — 0.6 million tonnes by rail;
- Russia–Iran (2.6 million tonnes of grain in 2020, 5.1 million tonnes in 2021) — transhipment in the Caspian ports;
- Kazakhstan–Iran — more than 1 million tonnes of grain by rail;
- Turkmenistan–Iran — 0.7 million tonnes of various cargo by road transport.

3.1. Containerizable freight traffic

The estimated upper range of INSTC container freight traffic, including all three main routes and all modes of transport, is 325,000–662,000 TEU (5.9–11.9 million tonnes) by 2030, depending on the scenario (Fig. 2). In 2020, the freight traffic along the three routes was equal to 20,900 TEU. Given the current geographical and commodity structure of foreign trade flows among the countries, the increase of freight traffic is more likely in the direction from north to south — up to 70% of the total container freight traffic by 2030. If the INSTC's potential is fully unlocked, we project the railway container traffic by 2030 to be 9–18 pairs of container trains per day cumulatively in the following directions: Russia/EU countries–South Asia, Russia–Azerbaijan, Russia–Turkey, Central Asia–South Asia, China–Iran. That is well within the peak capacity of single-track railways, which is up to 24 pairs per day on the territory of the Islamic Republic of Iran.

All three INSTC routes are essential for expanding the corridor's potential. However, the most significant potential is associated with the Western and Eastern routes. The share of these routes in total potential container freight traffic is about 60% and 24%, respectively. Domestic and international railway freight traffic and the associated freight road transport have been actively expanding from Finland to Azerbaijan during recent years. Furthermore, after the launch of the new Zhanaozen–Gyzylgaya–Bereket–Etrek–Gorgan railway line in December 2014, with a length of more than 900 km, freight traffic emerged along the Eastern Route between Kazakhstan, Turkmenistan, and Iran, with the potential for attracting Russian cargo for delivery to Turkmenistan, Afghanistan, and Iran. As with the East—West Transport Corridor, the development of the INSTC shows that railway freight traffic will be the key driver for expanding the transit potential of the Eurasian land routes (Vinokurov, 2020).

Expansion of INSTC container freight traffic is of considerable and rapidly rising interest to the EAEU member states (Fig. 3). Those states could generate freight traffic of 245,000–501,000 TEU by 2030 (4.4–9 million tonnes, or 7–13 pairs of container trains per day), or about 75% of total potential container traffic Interlinking the INSTC and the Baku–Tbilisi–Kars latitudinal corridor can also positively impact the trade of the EAEU member states. That connection would enable the expansion of container traffic between the EAEU, Georgia, and Turkey. Among the EAEU member states, Russia and Belarus are the primary beneficiaries. There is no direct railway line between Russia and Turkey, and international road carriers have encountered significant difficulties as the transit of goods through Ukraine was terminated.

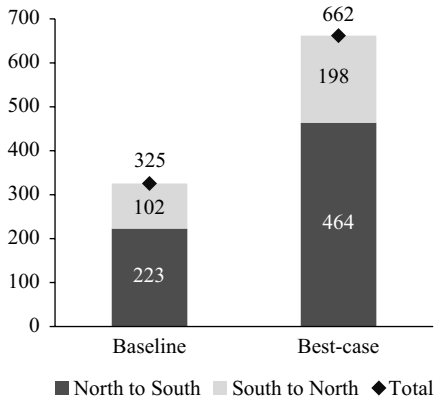

Fig. 2. Potential container traffic of the key INSTC routes in 2030 (thousand TEU).

Source: Authors' calculations.

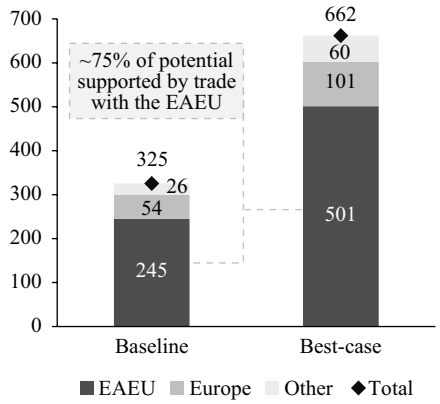

Fig. 3. Potential container traffic of the EAEU and Europe with INSTC southern partners in 2030 (thousand TEU).

Source: Authors' calculations.

The high potential of INSTC container freight traffic for the EAEU member states can be attributed to two factors. First, that bloc of countries maintains close trade relations with countries in the south of the corridor and actively pursues a policy to expand those relations. Our analysis shows that the development of the INSTC will be considerably more beneficial from an economic standpoint if it assures full realization of the regional trade potential in the interests of the participating countries, including by linking them to the continental routes leading to the interior Eurasian regions. Second, in the future, the EAEU can fully support transit freight traffic between EU, India, Pakistan and other southern countries of the corridor. The realization of the transit potential resulting from improved transport connectivity in the Eurasian continent, incl. by growth of revenues from the market of transport services, will undoubtedly have a salubrious effect on the economies of the participating countries.

Freight traffic between seven EU member states, India and Pakistan may potentially amount to 54,000–101,000 TEU per year, or about 8% of total north—south traffic and more than 35% of the reverse south–north traffic. The aggregate freight traffic between those countries could potentially amount to 17% of the total container freight traffic by 2030. Importantly, that potential could be realized not only by direct access from INSTC to Finland and Estonia, but primarily by interlinking the INSTC in its northern section and the latitudinal trans-Siberian international transport route through OSJD Corridor No. 1, providing access to Europe via Belarus and then on to Lithuania, Poland, and Germany.

Moreover, the effect of interlinking the INSTC and the latitudinal TRACECA international transport corridor may also encourage redirection of the existing traffic and generation of new traffic through the expansion of trade with the southern countries using other transport corridors. For example, by 2030, potential container freight traffic between China and Iran using the corridor's infrastructure could amount to 19,000–42,000 TEU, with most cargo carried from China to Iran. Thus, synergies arising from interlinking the INSTC and the Eurasian east–west latitudinal transport corridors might be equivalent to 127,000–246,000 TEU (2.3–4.4 million tonnes), or about 40% of total potential container freight traffic.

4.2. Non-containerizable freight traffic

In this study, we did not include certain significant product categories in the assessment of potential INSTC container freight traffic. Those categories are LNG, oil and petroleum products, coal and coke. The specifics of these products is subject to infrastructural restrictions or tariff efficiency making the use of the INSTC impossible. There is a track gauge difference (1,435 mm in Iran vs. 1,520 mm in other Caspian countries), safety requirements for reshipment or gauge change on freight cars used for transportation of gas, oil and oil products. Moreover, transhipment of coal or coke significantly increases the cost of delivery.

Grain is traditionally the main product transported along the INSTC, especially by eastern rail route and via Caspian ports. In 2020, only between Russia and Iran 2.6 million tonnes of grain were transported. In 2021 this volume was doubled. Also Kazakhstan exported to Iran more than 1 million tonnes per year. In the future, expansion of the INSTC may have a beneficial effect on grain traffic. For example, the corridor may open new windows of opportunity to export grain from Kazakhstan and the Russian Federation. The leading importers of grain are Azerbaijan, Turkmenistan, Turkey, Iran, India, and Pakistan. It is worth mentioning that Iran and Turkey have long-standing swap practices, when grain supplied from Russia and Kazakhstan is consumed inside these countries, and their grain is subsequently exported to third countries. It is projected that INSTC grain traffic may reach 8.7–12.8 million tonnes by 2030. The INSTC grain freight traffic forecast is based on actual data on harvested and exported grain (wheat, barley, maize) by countries along the corridor. The forecast covers only the transport of grain by hopper rail cars, trucks and bulkers. Grain and flour transported in containers are included in the relevant INSTC container traffic forecast under the category "food cargoes." The INSTC will compete with the Black Sea ports for grain cargo, so the development of the railway and terminal infrastructure, as well as the creation of favorable tariff conditions, will become the determining factors in attracting grain to the North-South transport corridor.

To sum up, by 2030 the total potential INSTC traffic, including container and non-container cargoes, is expected to reach 14.6–24.7 million tonnes. This total potential of the corridor includes all correspondence within the local sections of the corridor, for example, Russia–Azerbaijan, Turkmenistan– Iran, etc., as well as in conjugated sections (Russia–Turkey, China–Iran, etc.).

4.3. Commodity structure of freight traffic

Fig. 4 shows the main commodities that could be dispatched in containers along the INSTC routes. Currently, the main product categories capable of containerization in all trading pairs of the transport corridor are as follows: food products (excluding grain and bulk oil), metals (ferrous and non-ferrous metals, metal products), wood, wood products, and paper, machinery and equipment, mineral fertilizers, textiles, textile products, and footwear.

Grain is the main non-containerized cargo transported along the INSTC. It is estimated that by 2030 the INSTC grain traffic may reach 8.7–12.8 million tonnes and will continue to exceed the potential container traffic generated by all other product categories combined.

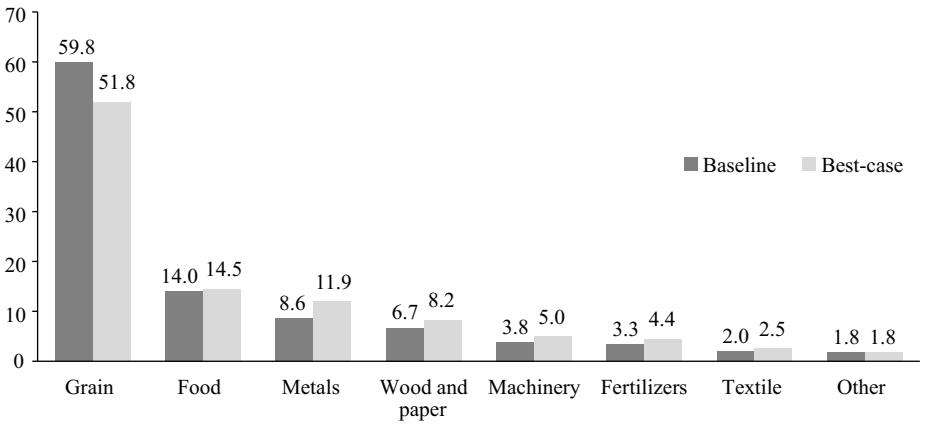

Fig. 4. Commodity structure of the total potential freight traffic on the INSTC routes for 2030 under the baseline and best-case scenarios (%).

Source: Authors' calculations.

Among the containerized products, food will become one of the most common types of cargo in the future in both the southern and northern directions of the INSTC. Notably, it requires specialized rolling stock — reefers such as railreefers and containers, as a significant part of food cargo is perishable.

Given that the key advantage of the INSTC relative to the deep sea route through the Suez Canal, is its significant reduction of time delivery, it could be used for the transportation of inelastic demand goods and expensive cargoes. These include electronic equipment (computers, 3D printers), engineering products (industrial robots), and some essential goods. Development of the global e-commerce market can also give an additional impetus to freight traffic growth, as that sector prioritizes the rapid delivery of goods to consumers.

5. Bottlenecks and international economic policy

The challenges that the INSTC faces as it continues to evolve include uncoordinated transport policies of the member states, international sanctions, the economic crisis, non-harmonized international transport law and standards, border-crossing procedures and formalities, missing links and bottlenecks along the corridor's sections (Fig. 5).

Transportation of cargo along the INSTC is also associated with additional insurance costs. All these factors currently prevent the INSTC routes from gaining the competitive edge needed to expand container transit between India, other countries of South Asia and the Persian Gulf, and Europe.

The transport policies pursued by the INSTC Agreement member states are not sufficiently aligned, and meetings of the Coordination Council are held irregularly. There were no meetings in 2007–2017, and the last meeting took place in March 2019, while meetings of expert teams established in accordance with the Charter of the Coordination Council to discuss matters related to the operation of customs, ports, etc. are not convened at all.

National policies may also inhibit expansion of the corridor. In particular, restrictions imposed by the Federal Customs Service of Russia on the use of TIR carnets

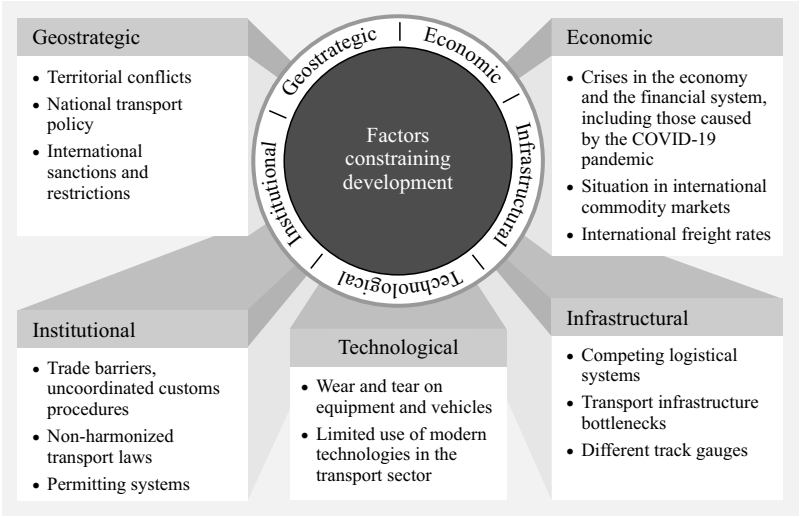

Fig. 5. Factors constraining development of the INSTC.

Source: Compiled by the authors.

in the Russian Federation, together with international sanctions, resulted in freight traffic switching from the INSTC to other corridors. Sea routes and TRACECA corridor were used as alternatives for the delivery of cargoes, including perishable ones. The statistical agencies in Turkey, Iran, Georgia and Azerbaijan recorded an increase in west–east freight traffic, while north–south traffic declined.

Permitting systems are one of the key mechanisms used to gain access to the international road transport market. In the INSTC states, those systems are mostly bilateral, and imply individual conditions governing carrier access, transit operations, etc. Most Eurasian countries currently have no bilateral agreements with India and Pakistan, which prevents direct road freight transport, inflates delivery costs, and causes problems with third-party liability coverage of cargoes and vehicles.

The absence of a through railway tariff hinders attracting new cargo flows to INSTC. The best practice implemented in the Trans-Caspian corridor (also known as the "Middle Corridor") on tariff policy coordination and publication of through tariffs clearly demonstrates the interest of cargo owners and international forwarding agencies in this mechanism. Negotiations between the INSTC countries aimed to establish through tariff rates are equally in demand for both — Western and Eastern INSTC routes. There are limited opportunities for the development of a direct railway service between the Caspian countries with 1,520 mm rail system and the Islamic Republic of Iran using 1435 mm rail standard, because of the need to resolve the gauge changing problem. An automated break-of-gauge system is not economically feasible for freight operations (since it requires construction of thousands interoperable fitting platforms and railcars for other cargoes). Moreover, the shared usage of railcars by Iran and countries of "1520 space" has not been implemented yet. One possible solution is the transhipment of containers from one fitting platform to another, as is done with China–Europe container trains on the Chinese border where the gauge also changes from 1,435 to 1,520 mm. Still, different track gauges remain a significant

obstacle for transporting other types of cargo, e.g., liquid cargoes, where bogie exchange or car-to-car transhipment is not always possible for safety reasons.

Infrastructural issues are also encountered by the Russian Federation when it uses the multimodal water route. The Volga–Caspian Canal, used by sea-going vessels to call at the ports of Olya and Astrakhan, gradually accumulates sediment, which requires regular dredging. If the multimodal traffic significantly increases, it will be faced with a shortage of modern fleet (bulkers, container ships, Ro-Ro) on the Caspian Sea.

Development of the INSTC is constrained by certain administrative issues: the lack of a transport corridor's managing company such as Trans-Caspian International Transport Route Association, the absence of coordination of rate policies for railway freight services, uncoordinated customs rules, as well as the lack of marketing policy and end-to-end ferry and schedules apart from the Aktau/Kuryk–Baku/Alat line in the TRACECA corridor.

6. The North–South Corridor and the evolving trans-Eurasian connectivity

The operationalization of the meridional INSTC creates opportunities to link up with transport corridors running from east to west. That enables the development of a Eurasian transport backbone, a network of interconnected international east–west and north–south transport corridors in Eurasia. Such a backbone generates additional freight flows through synergies from interlinking trade routes and modes of transport and provides Eurasian landlocked countries with access to markets. LLDCs generally experience weaker growth than countries with access to the sea, with average growth of the former being about 1.5 percent points less (Arvis et al., 2010). The Eurasian transport framework will help to reduce delivery time along the corridors by avoiding duplication of efforts, promoting regional connectivity, and maximizing associated economic opportunities. Therefore, INSTC will contribute to transforming Eurasian states from landlocked to "land-linked" countries. New logistical opportunities can achieve goals not only for transport connectivity, but also for trade development and facilitation.

INSTC is an essential component of the network of latitudinal and meridian trade routes. For instance, the INSTC connects with Black Sea Ring Highway, Baku–Tbilisi–Kars Railway, CAREC corridors, Europe–West China International Route, OSJD corridors, TRACECA, Trans-Siberian Railway, Lapis Lazuli corridor. Therefore, the development of the INSTC contributes to the establishment of an integrated Eurasian transport backbone. It will, in turn, serve as the basis for regional trade and investment cooperation.

All major economic powers of the Eurasian landmass — China, Russia, India, South Korea, and the EU — will benefit substantially from developing the Eurasian transport backbone. Transcontinental connections offer faster (at least twice the speed) and greener (at least 25% less) delivery. They might be more stable. Regarding the Central Asia countries, linking the INSTC with the East–West transport routes in the Caspian Region lays the groundwork for transforming this region into a Eurasian transport and logistics crossroads.

Central Asian countries become a critical element and a major beneficiary of the Eurasian transport backbone. The sustainability and success of Eurasian integration processes will depend on the depth and intensity of Central Asia count-

ries' involvement. Coordinated efforts, aimed at the development of transport and logistics infrastructure, will reinforce the region's transport links with Asian markets (India, Iran, Pakistan, Turkey, China, etc.). The most important thing is that it will boost inter-regional connectivity within the Eurasian landmass and unlock new economic opportunities for many other Eurasian countries. These developments will help create local industrial centers and incorporate innovative industrial clusters and agriculture into the global value chains. As the Eurasian transport backbone reaches out to China, India, and the European Union, it can become a driver for implementing the idea of a Greater Eurasia and an efficient trans-Eurasian connectivity for common benefit.

7. Conclusions

We assessed the INSTC freight potential in the context of increasingly active interaction between EAEU countries, on the one hand, and India, Iran, and other countries of South Asia and the Persian Gulf, on the other. We gauge that significant opportunities may emerge from synergies between the transport corridor and global and regional latitudinal transport routes, the expansion of digitization as well as a marked increase of the climate agenda in the field of freight transport. By conducting a comprehensive review of current trade relations among the countries that can benefit from the INSTC, we have identified the potential freight traffic of containerized and non-containerized goods. Based on the existing research, expert assessment, reports on pilot runs, and operator proposals, the current study identifies transportation time and costs and compared it with the traditional route through the Suez Canal. Finally, the research defines scenario-based freight traffic estimates for all modes of transport and all INSTC routes: Western, Multimodal (Trans-Caspian), and Eastern.

Then, the INSTC may be transformed from a transport corridor into an economic development corridor. Implementation of large-scale transport infrastructure projects and achievement of seamlessness will build up a more complete and efficient Eurasian transport backbone, reduce time in transit and vehicle operation costs, and indirectly promote the sustainable development of the entire Eurasian region. In addition to expanding trade, the development of ITCs particularly encourages the construction of dry ports, industrial parks and special economic zones along transit routes, facilitates cooperation in the production of goods and services, and accelerates the creation of new manufacturing and logistics chains between the Eurasian Economic Union member states and the large developing countries of the Persian Gulf and the Indian Ocean, including Iran, India, and Pakistan. This, in turn, would help improve economic growth prospects in a sustainable manner, and increase welfare.

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