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The Baltic Sea Macro-Regional Transport Cluster as an Element of the Silk Road Economic Belt

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Abstract

This article analyzes the opportunities of the Chinese initiative "One Belt, One Road", for the development of the Baltic Sea macro-region (BSR), as a single transport cluster. One of the objectives of the initiative is to strengthen transport linkages from the Pacific Ocean to the Baltic Sea Region. Thus, the contemporary macro-regional approach to the development of EU macro-regions can provide an additional impulse to the creation of formal macro-regional inter-cooperation, via in this case, the project that will advance the transport infrastructure of the region. This study examines the situation of the railway sector in the BSR in the period 2004–2015, through hierarchical cluster analysis, to identify countries with similar trends in cargo flow turnover. Taking into account the favorable geographical position of Poland, its transport performance and advanced (in comparison to other Baltic Sea region countries) relations with China, it is concluded that Poland's conditions are more suitable to promote economic integration with its closest neighbors – the Baltic countries- through the creation of formal macro-regional railway transport within the Rail Baltic project.

KEY WORDS:

Baltic Sea macro-region, "One Belt, One Road" initiative, Silk Road Economic Belt, transport routes

Introduction

The increasing role of Brazil, Russia, India, China and South Africa (the BRICS), especially that of Russia and China, is widely discussed as a key symptom of the changing patterns in the global economy. In 2013, China presented its grandiose initiative "One Belt, One Road" (OBOR), also known as the New Silk Road, which has acquired wide international coverage.

The initiative brings together China, Central Asia, Russia and Europe and offers them huge potential for economic development (State Council 2015). One of the five goals set by the Chinese government is to strengthen the global transport network, connecting China with other continents, their regions (including the Baltic Sea Region) and countries, boosting inter- and intraregional cooperation. The focus is on the elimination of transport bottlenecks, the development of trans-border transport infrastructure and the creation of new international corridors and multimodal hubs (State Council 2015; Summers 2016).

On the international arena, the economic and political expansion of China is seen as a specific diversification tool, which is still at the planning stage and can face many serious challenges along the way (European Council of Foreign Relations 2015; Qingguo 2015; Huang 2016; Sárvári and Szeidovitz 2016). Summers (2016) divides the positions of the international community towards China's intentions into two main categories: 1) OBOR is seen as an instrument for promoting China's geopolitical and diplomatic expansion through investment injections into stakeholders' economies in such a clever setting as to have control over them and their political choices; 2) OBOR is seen as a tool for China's economic and commercial expansion to new markets to benefit its industrial companies, and the promotion of the national currency yuan as the new regional currency.

However, the construction of the OBOR is less likely to meet obvious strategic resistance from the Central and Eastern European countries (CEECs) (Liu 2014) and especially of the Baltic countries, because it offers opportunities for boosting their economies through increasing demand

towards transport services, which strongly depend on international relations between the European Union (EU), Russia and China. Moreover, the last decade demonstrates that bilateral relations between the Baltic countries with strategic trade partners tend to be of a complex character. For example, politically premature decisions made by the Baltic countries in their bilateral relations with the biggest actors of Russia (in 2007) and China (the visits of the Dalai Lama to the Baltic countries) have resulted in freezing, or in some cases even crises in national business and transport activity (Koppel 2008; Bochra 2015). In addition to political issues, cyclical economic fluctuation affects the trade and transport activity of the whole region. Still, after seven post-global economic crisis years, the BSR failed to achieve its pre-crisis (2004-2006) indicators of transport sector performance.

Background

EU exports to China constituted 9.5% (imports 20.2%) of its total exchange volume in 2015 (European Commission 2017). All countries of the BSR are net importers of Chinese products. China's share in their import structures varies from 3% (in Lithuania) to 13% (in Denmark). Denmark, Poland and Norway can be considered as major trade partners in the region for China, their average imports from China were 11% and exports to China were 6% in 2015. Around 1% of all Latvian and Estonian exports go to China, and Lithuanian exports account for only 0.5% of its total export volume (World Bank 2017). These variations are driven from the specialization patterns of the different economies and reflect where their companies operate in global production chains.

Presently, maritime transport is still more competitive in cost and capacity in Baltic-Chinese mutual relations, but not in the delivery lead time. Chinese intentions to extend, within OBOR, railway connections (via its financial funds) to Europe will reduce its overdependence on sea transportation (Liu 2014) and cause a shift in the international transport modal split towards the railway transport mode.

The railway infrastructure of the CEECs has traditionally been underfinanced by the public sector and the opportunity to attract foreign direct investments from China for that purpose is seen as a tool for the reanimation of that transport sector, especially in the BSR. From 2010, the countries of the BSR have competed for a direct project with Chinese investors in the field of Transport and Logistics. As a result, in 2013, Chinese FDI inflows reached about 13.1 billion USD in CEECs, whereas the special place of Poland in Chinese foreign trade policy is justified by 1.6 billion USD invested to it (Jaroch 2016). At the moment, China has actively set bilateral agreements with some EU countries for opening a container train-line in these new directions:

- Suzhou-Manzhouli-Warsaw,
- Chengdu-Łódź,
- Zhengzhou-Hamburg,
- Beijing-Hamburg,
- Kunming-Rotterdam,
- Harbin-Hamburg,
- Yiwu-Madrid,
- Yiwu-Riga.

These routes allow delivery of goods via a distributional network to the point of destination, reducing Chinese dependence on maritime transport. In terms of competition for Chinese cargo, all of the routes compete with each other. However, they can be seen as the basis for further integration into the main routes of the Silk Road Economic Belt. The authors point out here that block trains between Europe and China are currently functioning more as an (informal) business initiative. Demand for the development of a regular block train is insufficient, and there also exists the problem of the lack of return trips from Europe to China (Islam et al. 2013). An essential component in the solution of these problems is the promotion and realization of intergovernmental (formal) cooperation around the macro-regional transport corridors.

The geographical coverage of this study is the BSR, which consists of Poland

(PL), the Baltic countries (Estonia - EE, Latvia - LV, Lithuania - LT), Nordic countries (Finland - FI, Sweden - SE, Norway - NO, and Denmark - DK), and Germany (GE). The territories of all these countries are covered by "old" and "planned" transport routes, which have been developed on the basis of macro-regional cooperation by national and intergovernmental initiatives. These initiatives can be presented as umbrella projects that cover countries randomly, regardless of the performance of the country's transport sector, Logistics Performance Index, and involvement in the TEN-T corridors (Nežerenko and Koppel 2015).

This study uses the concept of a formal macro-regional transport cluster (Nežerenko, Koppel and Tuisk 2017; Nežerenko 2016), developed recently. The concept is intended to estimate the level of impact of the components of economic cycles on the demand for transport services in the macro-region (BSR), which helps to determine behavioral patterns of the transport sector at different stages of the economic cycle. Moreover, it helps to forecast development trends in the transport sector on the basis of its cyclical character, and to identify and eliminate potential bottlenecks in the sector that may obstruct its sustainable development. The concept raises the problem of the predominance of the business (informal) aspect of macro-regional cooperation.

The need to analyze the BSR as a macro-regional cluster is justified by the accuracy of the OBOR project and by the opportunity to create a formal macro-regional transport cluster, which can be promoted as an element of the OBOR's Silk Road Economic Belt. Transport structure development in the BSR macro-region addresses not only a transport connection within the EU (between "old" and "new" member countries), but calls attention to the importance of Baltic Sea infrastructure development concerning the interconnectedness between the EU and its Eastern neighbors, particularly China and Russia, but also Belarus and Kazakhstan. The authors of the study suggest that the Chinese initiative can offer an impulse to the creation of formal macro-regional inter-cooperation, which would promote the development of the transport sector, revitalizing economic growth in the region. Due to involvement of governmental stakeholders in the process of international business cooperation, the scale of benefits expands, increasing its competitiveness in certain sectors on the global level (Nežerenko and Koppel 2015; Nežerenko, Koppel and Tuisk 2017).

Within the study, the authors set two research questions:

1. How can the Silk Road Economic Belt contribute to the economic and transport development of the BSR?

2. What is the effect of bilateral relations of the BSR countries with China on cohesion in the region?

Scope of research

In strategic and ambitious infrastructure projects, the question of the priorities of the initiative arises. There are two approaches: the first is based on industrial activities that accelerate the development of new transport routes (demand-side impact). The second approach starts with large-scale infrastructure developments in order to attract future industrial and other activities (supply-side impact). The New Silk Road is based on the second approach, which has great potential to bring capital to the BSR, especially to the "new" member-states of the EU, like Poland and the Baltic countries, creating perfect conditions for positioning the region as an element in a global supply chain.

The OBOR initiative is comprehensive in its scope, tying together the coordination of national economic strategies, the elimination of barriers to international trade and investments, and financial cooperation. At the same time, efficiently functioning physical infrastructure is considered to be a cross-cutting element of the program (Huang 2016).

The OBOR consists of two parts: 1) the Silk Road Economic Belt is an inland transport route, which is based on the New Eurasian Continental Bridge and spreads from western China towards Europe and 2) the Maritime Silk Road is a maritime transport route which starts at the costal area of China and links the country with Africa and Europe. The OBOR is not a completely new transport route grid; it includes both existing and new routes (see Figure 1).

Figure 1: Silk Road Routes

Source: Summers 2015

The Silk Road Economic Belt, which is in the scope of the study, consists of:

- The Northern corridor (Beijing – Moscow – Helsinki – Rotterdam),
- The Central corridor (Beijing – Shanghai – Rotterdam),
- The Southern corridor (Fuzhou – Hanoi – Istanbul),
- Railway routes (Silk Route trains and Trans-Siberian Railway).

China's investments into infrastructure projects (excluding private investors and lenders) in the coming years are expected to be about 300 billion USD (European Council of Foreign Relations 2015). There are two high-speed railroads planned as cross-border projects of the OBOR, known as the main routes, that will connect the Asian region with Europe (Huang 2016):

- The Eurasian High-speed Rail (starts from England (London), crosses the territories of France, Germany, Poland, Ukraine and Russia (Moscow), where it will separate into two branches, one of which goes to Kazakhstan and another, through Russia's Far East, to northeastern China);
- The Central Asian High-speed Rail (starts from northeastern China (Urumqi), crosses the territories of Uzbekistan, Turkmenistan, Iran, and Turkey, and arrives in Germany).

As mentioned previously, the OBOR initiative is in its starting stage, and the projects are planned for the long term. Its realization could take at least 35 years (European Council 2016) and the transportation routes will be adjusted not only because of the expansion of bilateral business relations but due to the development of transport infrastructure already planned (i.e. core-corridors of the EU) and the political decisions of key countries.

Within the scope of this study, the authors' concern relates to the development of land transport routes. It is necessary to shift the focus of the study to the South part of the BSR, which can offer rail connection within the Silk Road Economic Belt and integrate it into the EU core-network. From this perspective, the current share of international rail freight transport in Denmark, Finland and Norway is low, while Germany, Sweden, Poland and the Baltic Countries are located in key international transport corridors.

In order to develop the BSR as a gateway for traffic between Asia and Russia on one hand, and Europe on the other, it is vital to develop the present transport network in the BSR into a formal macro-regional cluster which depends on:

- The economic power/potential of a region.
- The development level of regional infrastructure.
- The region's positioning relative to core national and international transport corridors.

The basis of the cluster approach in the organization of the transport sector involves the promotion of cross-border cluster cooperation by intergovernmental institutions, i.e. the recent Chinese 16+1 Format. The next factor that would secure a balanced use of existing and potential capacity of the infrastructure of national transport systems, is the intensification of cooperation within international transport corridors of the region (TEN-T and Core network). Therefore, development of a single BSR transport cluster must be based on the corridor approach (Nežerenko 2016).

Taking into account the geographical scope of the study and the Silk Road Economic Belt, there are five major transportation corridors that cross the territory of the BSR and can be seen as secondary transportation arteries of the OBOR:

1. The Baltic-Adriatic Development Corridor – an intermodal corridor which runs from Scandinavia down to the Mediterranean region/ Adriatic. This corridor supports integrated spatial, economic and infra-structural development in a country-crossing manner, in the European context. The corridor countries are: Austria, the Czech Republic, Italy, Poland, and Slovakia.

2. The North Sea-Baltic Corridor – a railway corridor which stretches from the North Sea ports through Poland to the Belarus border, and to the Baltic countries as well as to Finland. The key project is Rail Baltic and the Tallinn–Helsinki tunnel, which will solve the problem connected with the large section of the 'Organisation for Co-operation between Railways' (OSJD) rail gauge being 1520 mm. The corridor countries are: Belgium, the Netherlands, Germany, Poland, Lithuania, Latvia, Estonia, and Finland.

3. The Pan-European Transport Corridor I: an intermodal corridor which runs from Poland to Finland and includes rail and road infrastructure. Corridor countries are: Finland, Estonia, Latvia, Lithuania, and Poland. Major projects within the corridor are: Via Baltica, Rail Baltic, and the Tallinn-Helsinki tunnel.

4. The Pan-European Transport Corridor IX: an intermodal corridor which provides the transportation of transit goods between ports located on the shores of the Baltic Sea, the Black Sea and the Caspian Sea. This transport corridor provides external links of the EU with Russia and Turkey (via connection with the Pan-European Transport Corridor IV). Countries involved in the corridor are: Greece, Romania, Moldova, Finland, Lithuania, Russia, Ukraine, and Belarus.

5. The East-West Transport Corridor II (EWTC II): an intermodal corridor which runs from Denmark to Belarus, Lithuania, Poland, Sweden, and Germany.

There are two main transport modes included into the abovementioned corridors – road and rail. The rail chain is of special importance due to two EU projects: TEN-T project, Rail Baltic, and the Tallinn-Helsinki tunnel, which allow five countries of the BSR (Poland, Lithuania, Latvia, Estonia, and Finland) to cooperate not only in terms of building new infrastructure (to eliminate their isolation from West Europe by building the European standard gauge 1435 mm), but also in intergovernmental/formal promotion of the corridor on the global level (Nežerenko and Koppel 2015).

Thus, a formal cluster (based on the sharing and promotion of one rail corridor) and an informal railway cluster (based on business cooperation and common projects with China) will evolve into a strong macro-cluster, providing a stable competitive position of the BSR in the global transport and logistics market. In addition, Chinese initiatives will contribute to the liquidation of the main bottlenecks of the BSR transport system, including the lack of public and private investment resources for the rail sector, and the dominant tendency of transport and logistics clusters to only form on a national level (Nežerenko 2016). Thus, the OBOR initiative fills in the gaps in the existing international economic architecture helping build infrastructure projects for the developing and developed countries.

Hierarchical cluster analysis of the BSR railway sector

The authors address the BSR transport sector on a macro-regional level as a single formal transport macro-regional cluster, studied as a geographical concentration of transport actors in the region. The cluster is characterized by (1) formal regulation on behalf of the EU within the European Union Strategy for the Baltic Sea Region (EUSBSR); (2) homogeneity in the development of physical infrastructure; (3) homogeneity in transport sector performance; and (4) similar behavioral patterns at different stages of the economic cycle (Nežerenko 2016).

In accordance with the model of a single formal transport macro-regional cluster, homogeneity within its members (countries) must be provided. Previous analysis by Nežerenko, Koppel and Tuisk (2017) confirms the presence of heterogeneity in different transport sectors. However, sea transport tends to be a strong macro-regional cluster of informal maritime transport, due to numerous projects realized by business stockholders under the umbrella of the EUSBSR, launched by Sweden in 2009.

Macro-regional clustering experience in railway and road transport within the most isolated East part of the region is insignificant (Nežerenko and Koppel 2015). Taking into account the transport routes promoted by the OBOR initiative, the focus of the research is on the rail transport sector.

The authors apply qualitative research methods based on the statistical analysis of secondary quantitative data collected from the International Transport Forum database. The main tool in the analysis of the BSR railway transport activity is hierarchical cluster analysis (HCA), conducted by means of the SPSS software using Ward's method as a criterion that minimizes the total within-cluster variance. HCA is a statistical method for finding relatively homogeneous clusters of cases on the basis of measured characteristics (Tan et al. 2006). The idea of hierarchical clustering lies in the identification of each object initially as a single cluster (or country). Then, in multiple iterations, the two nearest clusters are merged into a larger one (micro-cluster). After a few iterations, the algorithm reaches the final cluster structure (macro-cluster/BSR). Thus, the goal of the clustering algorithm is to join objects together into successively larger clusters, using some measure of similarity or distance (Burns and Burns 2008; Nežerenko, Koppel and Tuisk 2017). The results of the analysis are presented by a hierarchical tree diagram, called a dendrogram.

In the scope of the HCA conducted in the study, transport activity is presented in cargo turnover handled by railway (in tonne-km) between 2004 and 2015 (see Table 1). The period of time was divided into three sub-periods: 2004-2007 reflects the economic growth stage of the economic cycle, 2008-2009 represents the crisis stage, and 2010-2015 the recovery stage.

Table 1: International transport of goods by railway, million tonne-km, 2004-2015

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
EE	9973	9892	9741	7267	5236	5350	5918	5491	4469	4012	2654	2603
LV	16397	17412	14798	16360	17370	14384	12885	21114	21495	19246	19125	18453
LT	10163	9033	9739	11414	11093	8798	10054	11447	10560	9698	10794	10537
DK	1649	1549	1633	1633	1747	1574	2075	2417	2107	2249	1788	2401
FI	2908	3099	3685	2853	3189	2731	2835	2598	2471	2968	3260	2621
NO	777	850	895	919	905	770	763	724	714	992	1022	1205
SE	7667	7547	7378	7569	7141	7213	8636	8415	7653	7605	7855	7291
GE	46478	46864	56484	60832	62390	46956	52788	54278	53739	53590	56241	55692
PL	15527	13961	16133	16919	15676	9580	11684	12925	14658	14685	14694	14277

Source: International Transport Forum 2016

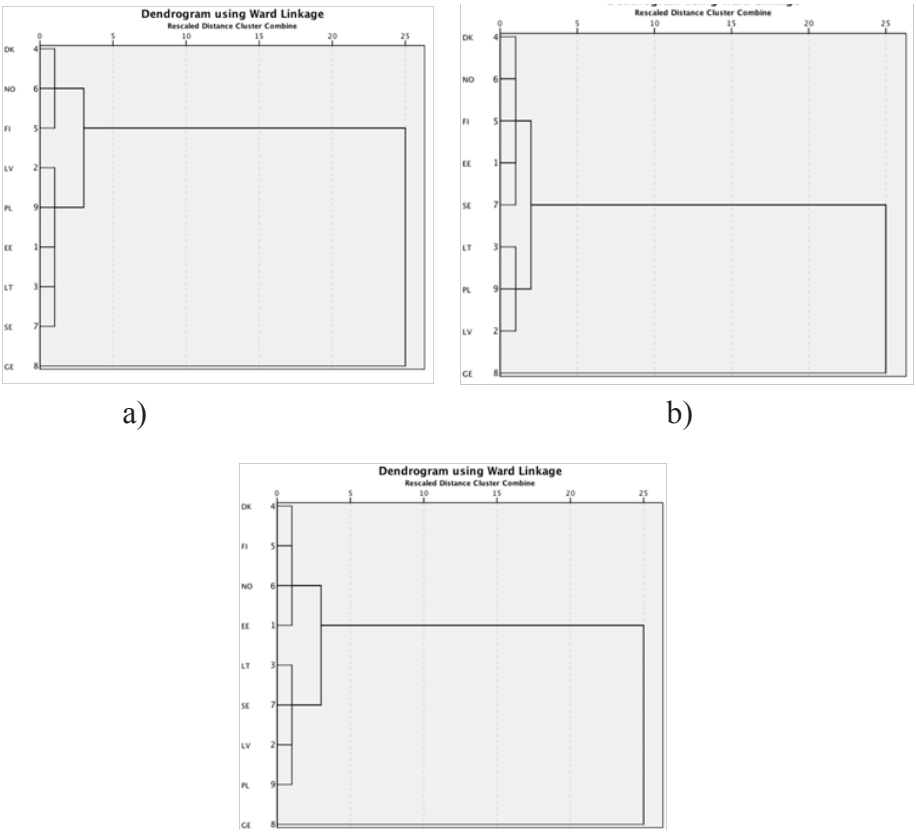
There are two limitations to the study: 1) the unavailability of statistical data on the origin of cargo flows via CEEC countries; 2) the lack of accurate statistical data on the transport performance of the northern parts of Poland and Germany. Only those parts of the countries are included in the BSR which conform to the definition given by the EC.

Results

Studies of Hätty and Hollmeier (2003), Bălan and Bălan (2010), and Franke and John (2011) confirm the cyclical character of the transport field. This cyclicity correlates with economic growth cycles measured by the gross domestic product. In the recent research of Nežerenko, Koppel and Tuisk (2017), this issue was specified and strong correlation was found between the GDP of the BSR and investments into road and rail infrastructures, as well as between imports and investments into rail and road infrastructure.

The purpose of the HCA was to identify the dynamics of the rail cargo turnover of the BSR countries and to compose so called micro-clusters consisting of countries with similarities in the dynamic development of the railway sector within three economic phases: economic growth (see Figure 2a), crisis (see Figure 2b), and recovery (see Figure 2c).

Figure 2: Dendrogram representing the formation of country clusters based on their railway transport flows during 2004-2007 (a), 2008-2009 (b), 2010-2015 (c)



a) b)

c)

During the economic growth period, Poland and the Baltic States composed a single micro-cluster and enjoyed the trade-creation effect (due to joining the European Union in 2004) via growing cargo flows of Russian export cargo and investments inflow.

At the beginning of the global economic crisis, Estonia left the cluster because of Bronze night and joined a more stable micro-cluster of Denmark, Finland, Norway, and Sweden. These countries had demonstrated relatively minor fluctuations despite the economic crisis unlike Estonia, which had already lost cargo because of the critical character of political decisions. In the post-crisis period, the biggest increase in cargo turnover (see Table 1) was demonstrated by the countries whose economies in

the crisis period were significantly weakened – Latvia and Lithuania who composed the micro-cluster with Poland and Sweden. Estonia was unable to recover its cargo turnover during 2010-2015 due to unfavorable relations with its largest transit ex-partner Russia. This fact confirms that the essence of bilateral relations is more important for the development of a strategically important sector for the country than economic fluctuations.

The development of physical infrastructure leads to the expansion of trade relations and to the intensification of countries' and regions' competitiveness. During China's reform period, the national investment program for infrastructure accelerated economic growth (Huang 2016). If investments inflow into rail infrastructure facilitates economic development, we can assume that Chinese financial funds can spread positive influence on the whole region via Poland. In addition to Poland's favorable geopolitical location (in the Eurasian Land Bridge), it is one of the driving force-countries in the Transport and Logistics sector in the region (Nežerenko and Koppel 2015).

Ketels and Pedersen (2016) report that the BSR is highly dependent on the global economy. They point out the following specific concerns for the Baltic Sea Region: 1) its weakening position in the world's exports and foreign direct investments markets since 2011 and 2) modest political action directed at enhancing long-term competitiveness of the region. Thus, economic policymakers need not only manage the current economic issues, but they also have to be ready for a possible slowing down of the economy in the future gaining from the advanced macro-regional economic cooperation.

The authors assume that a positive effect from the Chinese OBOR initiative can be derived if Estonia is in the same micro-cluster with Poland, Lithuania and Latvia. Positioned in the same micro-cluster and unified by common railway infrastructure, led by the driving force of Poland, the Baltic States will benefit from OBOR.

Conclusions

The authors conclude that the Chinese initiative will contribute to the liquidation of the main bottlenecks of the BSR transport system, such as the lack of investment resources for the rail sector and the absence of macro-cluster cooperation, providing favorable conditions for its sustainable economic development. Taking into account the favorable geographical position of Poland, its transport performance and its advanced relations with China, Poland has better conditions for the promotion of economic and transport integration with its closest neighbors – the Baltic countries. This cooperation must be based on the formation of the BSR transport cluster on the basis of the corridor approach, or within the Rail Baltic, to integrate it into it the Silk Road Economic Belt as its secondary transportation artery.

Cohesion in the BSR can be achieved only at homogeneity in the cyclical development of the transport sector. The railway sector demonstrates the following important heterogeneities within the countries analyzed:

- Denmark, Finland and Norway form the most stable micro-cluster in terms of railway transport in all three economic periods. The demonstrated stability is not only based on their similar geographical location, but on the low share of international cargo in their rail freight transport as well.
- Germany, Sweden, Poland and the Baltic States are located in the key international transport corridors, and more fluctuations can be observed in the micro-cluster of Poland and the Baltic countries, especially the latter whose transport activity depends on transit demand.
- The railway transport of Latvia, Lithuania and Poland is the most vulnerable in the crisis period, also demonstrating the quickest recovery within the macro-region.

In order to stay in the same micro-cluster with Poland, the Baltic countries must exclude any premature political decisions that are highly likely to cause dramatic consequences for international transport activity.

Despite the fact that cargo turnover transported internationally by rail via the BSR is relatively low, it is obvious that the Rail Baltic corridor will make the region more attractive to Chinese investors and cargo. Due to the route of Rail Baltic and its potential for clustering freight traffic volumes, this corridor has great potential for developing cost-efficient services to China, offering better conditions and new delivery routes in addition to existing ones.

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