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# ЦИФРОВАЯ ГЛОБАЛИЗАЦИЯ И ЭКСПОРТНЫЕ ПЕРСПЕКТИВЫ БЕЛОРУССКОЙ ТРАНСПОРТНОЙ ЛОГИСТИКИ

## А. А. КОРОЛЕВА<sup>1)</sup>, А. А. ДУТИНА<sup>1)</sup>

<sup>1)</sup>Белорусский государственный университет, пр. Независимости, 4, 220030, г. Минск, Беларусь

Выделены новейшие глобальные тренды развития мировой экономики, а также проанализированы конкурентные позиции белорусской транспортной логистики и ее перспективы на фоне цифровой глобализации. С учетом трендов сформулированы задачи, стоящие перед транспортной логистикой, направленные на развитие экспорта, и построен модельный прогноз развития экспорта грузовых транспортных услуг Беларуси до 2030 г.

Ключевые слова: экспорт; транспортные услуги; транспортная логистика; эконометрическое моделирование.

## DIGITAL GLOBALIZATION AND EXPORT PROSPECTS OF BELARUSIAN TRANSPORT LOGISTICS

### A. A. KOROLEVA<sup>a</sup>, A. A. DUTINA<sup>a</sup>

<sup>a</sup>Belarusian State University, 4 Niezaliežnasci Avenue, Minsk 220030, Belarus Corresponding author: A. A. Dutina (dutinaaa@bsu.by)

The article considers the latest global trends in the development of the global economy. The competitive position of the Belarusian transport logistics and its prospects, taking into account the digital globalization, are analyzed in the article. The tasks, taking into account the identified trends, set for transport logistics, aimed at the development of exports are formulated. A model forecast for the development of export of freight transport services in Belarus to 2030 is built.

*Keywords:* export; transportation services; transport logistics; econometric modeling.

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#### Авторы:

Анна Анатольевна Королева – кандидат физико-математических наук, доцент; декан экономического факультета. Алина Александровна Дутина – заместитель декана по воспитательной работе и социальным вопросам, старший преподаватель кафедры аналитической экономики и эконометрики экономического факультета.

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#### Authors:

Anna A. Koroleva, PhD (physics and mathematics), docent; dean of the faculty of economics.

koroleva@bsu.by

*Alina A. Dutina*, deputy dean for educational and social work and senior lecturer at the department of analytical economics and econometrics, faculty of economics. *dutinaaa@bsu.by* 



The article continues the research started in the monograph [1] and the articles [2–4], where the global trends of modern transport logistics were investigated. Against this background, the competitive positions of the Belarusian transport logistics and its export opportunities in the modern conditions of digitalization of logistics were analyzed. Based on the concept of digital globalization introduced in [5; 6], new tasks of the Belarusian transport logistics for export development are formulated.

Digital globalization, changes in international trade, digitalization of foreign trade and stagnation of world trade in goods do not contribute to the growth of transport logistics. The growth of the world trade in transport services is more or less adequate to the growth of world trade in goods (taking into account the decrease in the weight of world GDP and trade) that need to be transported from the exporting country to the importing country (fig. 1, table 1). The average annual growth rate of world trade in goods has slowed since the 2008 crisis and over the past 11 years from 2007 to 2018 exports was growing by 3.1 % and exports of transport services by 2.5 % (see fig. 1), i. e. the elasticity of freight traffic from world trade volumes and world GDP decreased due to digitalization, which increased the elasticity of service exports as a whole from world GDP. World exports of transport services in 2017 and 2018 recovered, after falling in previous years and exceeded 1 trillion US dollars. The growth was mainly caused by the growth of tariffs. UNCTAD forecasts an annual growth of 3.8 % in transport services exports until 2023.

Table 1

Dynamics of elasticity of transport services exports by world trade volume

Critarian	Year					
Criterion	2005	2010	2015	2018		
World exports of transport services, mln US dollars	576 340	826 850	902 790	1 016 600		
Cost of cross-border transport services per unit of world export trade in goods (elasticity of transport services exports), coefficient	0.057	0.055	0.055	0.053		

Note. Authors' calculations based on UNCTAD [7] data.



and transport services after the global financial crisis in 2007–2018. (authors' calculations based on UNCTAD [7] data)

It should be noted that the proportions between world trade in goods and services have shifted from 81:19 to 77:23, i. e. the share of services in world trade is growing (table 2).

The slowdown of the world merchandise trade is not only caused by the slowdown in GDP growth – average annual GDP growth rate after the crisis amounted to 3.56 %, but mostly because of the digitalization (virtualization) of GDP and, as a consequence, annual average growth rate of the world trade in services was 4.6 % increased its share in global GDP from 3.3 % in 1990 to 6.9 % in 2018 (table 2). Obviously, services do not need to be transported using traditional logistics, this is done mainly by the Internet. This is confirmed by a decrease in the share of transport services in world exports of services: in 1980 it was 33 %, in 1990 it was 25 %, in 2018 it was 17.6 % and by a sharp increase in the share of computer services. Half of the world's transport services exports come from the EU, followed by the US, Singapore and China.

Criterion	Year						
	1990	1995	2000	2005	2010	2015	2019
World GDP at the exchange rate, trillion US dollars	23.5	31	33.9	47.6	66.146	74.757	85.304
World exports of goods, trillion US dollars	3.4	5.1	6.4	10.2	14.903	16.204	19.132
World exports of services, trillion US dollars	0.783	1.19	1.465	2.415	3.921	4.963	5.845
Export quota for goods, %	14.5	16.5	18.9	21.4	22.5	21.6	22.4
Export quota for services, %	3.3	3.8	4.3	5.1	5.9	6.6	6.9
Proportion between world trade in goods and services, %	81:19	81:19	81:19	81:19	79:21	77:23	77:23

Dynamics of world GDP and world trade

Table 2

Note. Authors' calculations based on UNCTAD [7] and IMF.

Over the past 15 years the growth rate of Belarusian exports of transport services has been more than twice that of the world, and therefore the Belarusian share in world transport services exports, which declined sharply in 2014–2015 under the influence of Russian sanctions and anti-sanctions, has quickly recovered and has grown from 0.233 % to 0.378 % since 2005, reaching a maximum of 0.403 % in 2013.

As a transit state, the share of transport services in the whole services in Belarus is declining more slowly than in the world, and by the end of 2019, it is about 41 % of the export of Belarusian services. It is decreasing mainly because of the rapid growth of the share of modern virtual services (ICT services, business services) due to a decrease in the share of traditional ones.

The formulated trend is shown in fig. 2 and table 3. The average annual export growth in Belarus transport services for 10 years from 2009 to 2019 was estimated at 5.9 % and exceeded the global average by 2.36 times, and for 14 years compared to 2005 the increase amounted by 3 times. It should be noted that during the presidential republic since 1995, the export of transport services has increased from 302 mln US dollars in 1995 up to 4010 mln US dollars in 2019, i. e. by 13 times. One of the reasons for the growth of transport and logistics services is that only now our region is switching massively from self-service transport to logistics outsourcing.



and its share in world exports of transport services (authors' analysis based on UNCTAD [7] and the data of the Balance of Payments of the Republic of Belarus [8])

Cuitarian	Year							
Chienon	1995	2000	2005	2010	2015	2019		
The export of transport services of Belarus, mln US dollars	302.1	640.7	1341.2	2961.5	2928.2	4009.9		
Percentage of transport services in total exports of services, %	64.8	64.5	57.3	61.8	44.1	41.5		

Dynamics of export of Belarusian transport services

Note. Authors' analysis based on the data of the Balance of Payments of the Republic of Belarus [8].

In the publication [1] it was shown that the export of Belarus transport services depends linearly on the turnover (import) of Russia from the EU:

$$EXP(t) = 7.4765Ru EC(t) - 233.84,$$

what made it possible to predict that it could reach 6 bln US dollars by 2030. However, sanctions and antisanctions led to a sharp decline in trade between Russia and the EU from 380 bln US dollars in 2014 up to 200 bln US dollars in 2016, i. e. reduced it by 47 %, which, in accordance with our model, reduced the Belarusian export of transport services by 22 %. Later it was replaced by Chinese trade with the EU. Partial restoration of Russian trade with the EU in 2017 and 2018 to 253 bln US dollars and the growing Chinese railway trade with the EU (in 2019 it was 338.5 thsd containers) restored the Belarusian export of transport services and in 2019 brought it to a record figure of 4009.9 mln US dollars [7]. This is despite the fact that the share of pipeline transport services in the structure of exports of cargo transport services has significantly decreased due to low tariffs for the transit of Russian oil and the selling of gas pipelines to Gazprom (fig. 3). Thus, if in 2007 pipeline transport provided a third of the export of cargo transport services, then by the end of 2019 it was only 18.6 %.

In 2019 the situation was aggravated by losses due to the stop of oil pumping for almost a month due to pollution. Therefore, the agreed increase in the tariff from the 1<sup>st</sup> September by 3.7 % instead of the required 22 % does not compensate for the loss of the pipeline component in the total export of freight transport services. At the same time, the growth of Chinese trade turnover in Belarus and the expected growth of Russian imports of equipment and machinery from the EU allows us to hope for a small increase in 2020 in cargo export of transport services and export of transport services in general, in particular due to the growth of tourism due to the cancellation of visas.

Digitalization of the growing container traffic and implementation of the Belt and Road Initiative create new trade routes and new opportunities for Belarus to export transport services.



*Fig. 3.* Structure of export of cargo transport services of the Republic of Belarus in 2007 (*a*) and 2019 (*b*), % (authors' analysis based on the data of the Balance of Payments of the Republic of Belarus [8])

The growth of global cargo transportation volumes in containers continues and has exceeded 60 % of containerized cargo, while there the concentration of the market occurs – the CR5 concentration index has reached 65 %. Belarus has expanded its competitive participation in the global container transport market through the transit of Chinese containers to 338.5 thsd in 2019. The significant part of them returned empty begins to be loaded with Belarusian food and wood (the total number of containers that passed through Belarus exceeded 0.5 mln).

If in 2011 the Belarusian railway transported 2.5 thsd containers in the direction of China – EU – China, in 2019 it was 338.5 thsd in 20-foot equivalent. 3118 container trains from and to China passed through the territory of Belarus in 2019. Every day 12 accelerated container trains on the China – EU route pass through Belarus. It should be noted that according to Russian statistics 66 363 trains passed between China and Europe (some completed the route in Russia). It is planned that 1 mln containers will pass through Belarus to the EU in 2025.

The main reason for the rapid growth of container transport between China and Europe is the subsidy of about 3.5 thsd US dollars provided by the Chinese authorities for 40-foot container, which reduces the cost of its delivery to the EU to 5.5 thsd US dollars. Growing transit traffic by container trains from China to the EU (in China and the EU, the level of containerization has exceeded 70 % of freight traffic) requires not only acceleration up to 600 km/day of railway passage, but also digital RFID tags for tracking each container in real time. And the main thing is to reduce downtime in Brest at the border through electronic declaration and electronic sealing.

The digitalization of transport logistics has already begun, which has led, as PwC notes [9], to a change in consumer behavior, a shortage of digital specialists, changes to the data protection laws and the transition to electronic documentation.

Digitalization of logistics includes not only the transition to electronic documentation in transport logistics, but also the use of digital technologies, such as artificial intelligence and intelligent transport systems, the Internet of things, big data analysis, cloud computing, blockchain, and the robotization of warehouse work. Drones and self-driving cars are beginning to be widely used for cargo delivery. Thanks to digitalization, logistics will be consolidated, including optimization of delivery on the «last line» section. Digital transformation will lead to the creation of digital transport corridors with real-time supply chain visibility, including border and customs crossings, which:

- reduce costs through full transparency of supply chains and traceability of cargo;
- accelerate the delivery of the goods;
- increase the productivity of logistics companies.

The emerge of digital freight forwarders will lead to shared logistics (sharing), while the creation of 3D warehouses where ordered products are printed will only lead to virtual movement of goods.

Digitalization of Kazakh, Russian, and Belarusian sections of roads and customs within the framework of the EEU projects will speed up the passage of containers, reduce costs, and increase throughput to the planned 1 mln Chinese containers per year in the EU by 2025. Sets of measures for the digitalization of cargo transport services include the digitalization of document flow (e-TIR Carnet, e-CRM electronic invoices) and the introduction of electronic RFID tags for containers, all of which must be done in accordance with international standards for information exchange with mutual recognition of electronic digital signatures. Digitalization of the Belarusian railway requires:

- harmonization with the European digital railway traffic management system ERTMS;
- creating a digital container tracking system;
- fast electronic customs clearance.

In addition, the low capacity of Polish railways and the need to switch to a different track require the creation of a multi-modal logistics hub in Brest for storing Chinese containers, their reloading to vehicles for further delivery to a specific EU city.

Rapid growth of cross-border e-commerce with an average annual rate of about 20 % (in 2019 it was 260 bln US dollars) leads to an increase in the share of express deliveries and the construction of logistics warehouses for customs storage of mass goods (and these are mainly Chinese) and requires a digital transformation of the parcel delivery industry: electronic document management, Internet of things, warehouse robotization (fig. 4) [3].

More than a third or even more of online shoppers purchase abroad (about half in Poland), although, in general, cross-border purchases accounted for only 1.4 % of all retail trade in 2019. The number of international parcels with ordered goods is growing rapidly and in 2019 reached: in the Netherlands – 8.1 per 1 resident, in the UK – 5.1, in Russia – 2.4, in Belarus – 1.3. It is believed that cross-border e-commerce will become the new engine of world trade. Today on the global platforms *Amazon* and *AliExpress* almost all the world's brands



*Fig. 4.* Global e-commerce and its share of retail trade. Source: *www.ellarketer.com* 

are present as sellers. The main forms of logistics for cross-border e-commerce are international express delivery and standard parcels, foreign e-commerce warehouses and mini-warehouses for self-service delivery of parcels. However, their high cost is the main barrier to a more dynamic development of e-commerce. The issues of long-term efficient delivery of goods and parcels have not been resolved yet. Integration and targeting of transport logistics to e-commerce is necessary, and requires the creation of specialized companies with low cost, high speeds and security. The lack of specialists hinders the development of this area.

Since 40 % of the world's cross-border e-commerce belongs to China and about 60 % to the Asian region, a need to create a Belarusian-Chinese cross-border e-commerce zone in the «Great Stone» with an effective and fast system of cross-border payment for parcels appeared. Even *Alibaba* alone handles about 40 mln cross-border orders a year. It is also necessary to introduce new business models of transport logistics management: electronic exchange trading, uberization of delivery (Uber Freight), etc. (for more details, refer to [10]).

The growth of Belarusian exports of freight transport services is accompanied by an even faster growth in imports of freight transport services, mainly due to the imposition of a foreign partner on Belarusian importers of their cargo carrier and the lower competitiveness of small Belarusian firms of road carriers compared to global multinational companies of road carriers.

In the fig. 5 the coefficients of coverage in 2000 and 2019 of exports by imports of freight transport services are presented, which confirm the formulated trend.

Urgent measures must be taken to include Belarusian carriers in import contracts, otherwise the share of the positive trade balance of cargo transport services in the total cargo turnover will continue to decrease: in 2000 - 78.6 %, in 2010 - 40.7 %, in 2019 - 36.5 %. Despite the fact that in absolute terms, the trade balance of transport services as a whole is increasing: 2000 - 555.4 mln US dollars, 2010 - 1491.7 mln US dollars, 2019 - 2070.1 mln US dollars).

The author's model forecast up to 2030 (table 4) shows that by 2030 Belarusian exports of transport services may reach 6 bln US dollars, i. e. increase by 40 % over 10 years due to a sharp increase in road and rail freight traffic, growth in inbound tourism to the country and the transfer of tariffs for the transit of



Fig. 5. Export coverage ratio for imports

of freight transport services in Belarus in 2000 and 2019, coefficient

(authors' analysis based on the data of the balance of payments of the Republic of Belarus [8])

Russian oil and gas to the international level, including through the creation of OPEC transit companies in Belarus, Ukraine, Poland, etc. Prospects for the development of the export sector of transport services in Belarus in the world market of logistics services are formed under the influence of national factors and global trends described above. The ARIMA (2,0,0) trend model built in [1; 2], which takes into account trends in logistics development and historical data for the period from 2000 to 2019 by transport type, allows us to forecast the volume of exports of transport services of the Republic of Belarus until 2030 (table 4).

Due to the fact that 3 different models were used to obtain an average consensus forecast, the following hybrid approach is proposed:

$$\operatorname{EXP} G(t) = \sum_{i} \alpha_{i} \operatorname{EXP}_{i}(t), \ i = \overline{1, 3},$$

where *i* is the number of the forecast model and  $\alpha_i$  is its weight. The weights  $\alpha_i$  are set in proportion to the accuracy of the model.

Over the current five-year period, more than 1.3 bln US dollars has been invested in the development of Belarus' logistics infrastructure. As a result, 59 logistics centers are functioning in the country, including 13 state-owned, the rest are private and foreign. To achieve the goal of the concept of development of the logistics system of Belarus until 2030 (Resolution of Council of Ministers of 28 December 2017, No. 1024) to increase transit revenues by 2 times compared to 2016, it is necessary to increase the export of transport and cargo services to 6 bln US dollars, what table 4 shows is not so easy to implement.

Table 4

Service	Year								
	2018	2019	20	20	2025	2030			
			Old forecast	New forecast	2023				
Railway	916.6	926.8	1474	1190	1300	2000			
Automobile	1306.6	1374.4	1926	1400	1700	2000			
Pipe and transmission of electricity	620.7	600.7	560	750	1100	1320			
Air	45.9	42.6	45	45	48	50			
Sea	324.1	277.5	360	300	330	350			
Total	3214	3222	4365	3685	4478	5720			

#### Forecast of export of freight transport services, bln US dollars

Note. Authors' analysis based on the data of the Balance of Payments of the Republic of Belarus [8].

Only the advanced digitalization of transport and logistics services at all stages will allow us to meet the forecast and the goal of achieving the export of freight transport services of 6 bln US dollars. At the same time, it should be taken into account that Russia is reorienting the main cargo flows to its ports on the Baltic sea, and purchases of Russian coal in the EU are sharply reduced due to environmental problems, and Chinese cargo in the EU may also be reoriented to the southern and Ukrainian directions.

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