Investigation of the market potential of transport and logistics services in the 1520 space

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Abstract. The article considers possible and relevant instruments of strengthening the market potential of transport and logistics services with a view to its integrated development in order to fully and effectively meet business needs. The basis of this article is the use of the following research methods: 1) statistical analysis of the time series, which is based on the study of the analyzed indicator, presented in the form of a specific time series, and its quantitative change over a long period of time; 2) comparative analysis based on statistical data; 3) the calculation of specific economic indicators (transport capacity, quality indicators, etc.). According to the research results, it was proposed to take into account the need to reduce the transport capacity of GDP in terms of cargo turnover for the countries with predominant international traffic in order to reduce the transport burden on the economies of countries and manufacturers. It was concluded that the potential of the market of transport and logistics services is provided by the structure of rail transportation by type of cargo, business relationships with partners, the location of productive forces, the development of customer-oriented approach of 1520 countries transport systems and the desire to improve logistics efficiency and quality of transport services for cargo owners.

1. Introduction

The most important direction in the development of the transport industry of the modern economy is the elimination of constraints and the activation of drivers for the development of integrated transport and logistics services to fully and effectively meet business needs.

The potential of transport and logistics services is the cumulative need of branches of national economies to move certain goods from manufacturer to consumer, characterized by qualitative and quantitative parameters for a specific time period.

In most countries of the 1520 space, the potential for the development of transport and logistics services is substantial. In order to actualize this potential, the following are needed: arrangement of conditions for the formation of business needs in the implementation of effective supply chains of value creation, synchronization of production and sales planning, inventory optimization and reduction of physical distribution costs of enterprises.

In the study, the potential of transport and logistics services in the 1520 space is analyzed from the standpoint of economic trends and the rail transport requirements of economic of the countries of the Euro-Asian space.
2. Research methods

Forecasting the market potential of transport and logistics services, taking into account the dynamics of the region’s development and the growth rates of countries’ GDP, is based on the concept of transport intensity and includes the following steps:

- determine the countries included in the investigated region;
- determine the development trends of the main cargo-forming enterprises and organizations (by industry) under the influence of the internal state and external environment of the region;
- calculation of the share of GDP, which determines the volume of transport and logistics services;
- determining the growth rate of GDP, adjusted for the ratio of the impact of growth in business activity in the region on traffic volumes in the planning horizon using the formula:

\[
\text{average annual growth} = \frac{2030^{\frac{1}{1980}} \cdot \frac{GDP2030}{GDP_{1980}} - 100}{\%}
\]  

- calculation of forecast values of GDP for the planning period;
- calculation of transport capacity of the GDP for the base period;
- (transport capacity — a macroeconomic indicator of the level of transport work and transport and logistics services per 1 ruble of gross domestic product of the country for the same year);
- the forecast of the potential of transport and logistics services, in relation to the GDP growth of countries with 1520 railway gauge.

3. Research results

The transport systems of 1520 countries are the driver of economic growth in the Euro-Asian space, the total GDP of which is half of the global GDP [1]. Global production and consumption centers form the transit potential of 1520 countries in the East-West and North-South directions and the need to develop transport and logistics services in order to move goods in these directions.

The growth potential of cargo traffic and transport and logistics services with a high share of added value significantly depends on the volume of traffic in countries with 1520 gauge, and on the need for rail transportation of the countries that do not have this gauge but are adjacent to 1520 space, and of the countries using this space for cargo delivery. Clusters of transport systems of 1520 countries for analyzing the impact of macroeconomic indicators are formed according to the principle of:

- organizational consolidating in Unions, Councils and Associations;
- political and geographical affiliation;
- transport corridors.

Political turbulence and expediency influence the railway administrations of 1520 countries in matters of joining councils, communities and associations, defining various forms of interaction (associative members, participation in work on individual contracts, observer status, etc.). Organizational clustering of countries (belonging to the communities, unions and associations) determines tactical decisions in the transport and logistics services market, the principles of integration of the information space, the harmonization of shipping documents and transport laws.

The influence of the dynamics of macroeconomic indicators on the potential of transport and logistics services in the 1520 space is considered from the standpoint of economic trends and the structured need for rail transportation of Euro-Asian space economies.

The transport systems of 1520 countries are the drivers of economic growth in the Euro-Asian space, uniting 90 states with a population of over 5 billion people (70 % of the world’s population), whose total GDP is half of the global GDP. Transport flows between global production and consumption centers on the continent form the transit potential of 1520 countries, in which the East-West and North-South transport systems play a leading role [2].

Global trends are associated with the concentration of transport flows, the growth of container traffic through intermodal transport corridors, which become the basis of a unified transport network.
of the 21st century, an increase in the speed of movement of goods along logistics chains and the level of costs affecting the competitiveness of products of the Asia-Pacific countries.

The geographical position of Russia as a land-water artery of cargo flows between the main macroeconomic poles — the countries of the EEC and the APR, and in the longer term between the countries of America and Eurasia has a huge transit potential. The transit route from the Asia-Pacific Region to Europe via the Trans-Siberian Railway is twice as cheap and shorter than the sea route (delivery time for containers via the Trans-Siberian Railway is 8–12 days, via sea transport is 1–2 months).

For now, in most 1520 countries, logistics planning is poorly linked to production planning, sales planning, and inventory planning. Logistics in them is a simple transportation, bound by several contracts, and forwarding is more a service of “pushing cargo” than a logistics service. With this approach, the strategic potential of logistics remains undeveloped.

In a strategic perspective, the potential of transport and logistics services is determined by the business relations of partners, the location of productive forces and trends in the economic development of the Euro-Asian continent, as well as by structural changes in the cargo flows of the 1520 countries.

The development of the transport and logistics services market takes place under the conditions of awareness by manufacturing companies of the inefficiency of internal logistics and the need to optimize logistics costs to maintain the competitiveness of goods and services. For the countries of 1520 space and the leading participants in the transport services market (in terms of the development of transport infrastructure and the state of the economy) it is typical:

- the nonoptimal location of production facilities, the remoteness of the raw materials mining points and centers of their consumption, a large proportion of the raw goods transported for export by countries with large territories;
- the predominance of transportation of commodity groups of goods in the structure of cargo traffic;
- in the implementation of transcontinental cargo transportation
- remoteness of the main places and regions of production of export goods from the ports;
- poor development of the integration of logistic schemes for the delivery of certain goods and external logistics;
- insufficient development of warehouse and logistics infrastructure.

Based on surveys of international and national logistics companies, the World Bank generates a five-point scale logistics efficiency rating based on the main characteristics of the logistics system: customs clearance, the quality of the logistics infrastructure, the ease and prices of delivery scheme, competence and quality of service, the ability to track and control cargo and delivery frequency. The rating is calculated every two years and covers 160 states.

The top ten rankings are mainly European countries. The first place since 2007 has been confidently held by Germany, which also succeeds in every year increasing the overall level of LPI. The growth of this indicator is observed in Latvia, Kazakhstan and Estonia; in Russia, Finland and Uzbekistan, the estimates are stable (deviations are not significant); in other countries, there is a decrease in the scoring estimate of the effectiveness of logistics.

In the overall structure of the transport and logistics services market, the largest share (over 70 %) is occupied by the cargo transportation segment and a smaller part is occupied by transport and logistics services, the volume of which is not measured in tons. The study of the interrelation of the volume of the transport and logistics services market with the cargo turnover shows their significant interdependence (correlation coefficient is 0.99), the interrelation with the country’s GDP has a correlation coefficient of 0.93 [3].

When formulating long-term development programs, we consider it expedient to take into account the need to reduce the transport capacity of GDP in terms of cargo turnover for the countries with predominant international traffic in order to reduce the transport burden on the economies of countries and producers. At the same time, the development of customer-oriented approach of 1520 countries transport systems and the desire to improve the quality and efficiency of logistics will lead to an
increase in the volume of not measured in tons transport-logistics services as a part of the GDP of all countries.

The structure of rail transportation by type of cargo has a significant impact on the potential of the transport and logistics services market. The growth potential of transport and logistics services is associated not only with the growth of traffic, but also with the possibility of “return” of goods to the railway [4, 5].

Losses in transport potential are defined as the difference between the possible traffic volume, taking into account the growth rate of mining/production, and the actual traffic volume (Figure 1).

![Figure 1. Losses in cargo shipments by railway transport in Russia, million tons.](image)

The normalized graph is used to display the relative contribution to the total losses by type of cargo.

It is also proposed to consider the promotion of measures to improve the quality of transport services for cargo owners as an element of customer-oriented approach of transport business as a tool for developing the market potential of transport and logistics services.

The quality of transport service is a set of characteristics and parameters of the transportation process that are provided by all participants in the transportation process as represented by the rolling stock operator, carrier and infrastructure owner from the moment the cargo is received for shipment (signing the transportation agreement) until the cargo is delivered to the destination, implementation of which represents the main interest of cargo owners with the purpose of their full satisfaction from the transportation work done.

In general, the economic theory of the transport services quality is based on the following main provisions:

1. The relative nature of quality indicators, that are determined by the ratio of actual and regulatory values of the indicator. This allows to ensure the comparability of the results of calculations performed for different types of transport, transport companies, transportation options, etc.

2. The need for a combination of natural and monetary estimations of quality, i.e. determining the level of quality, and costs and results associated with its achievement. It is unacceptable to include the price of transportation among quality indicators, since price and quality are equivalent factors of competitiveness of transport products.

3. The orientation of the transport services quality management system to the interests of the consumer, subject to compliance with transportation process technology.

4. Quality management system commitment to the final, rather than intermediate, result.

5. The need to assess the effectiveness of quality management, taking into account the costs and benefits that arise outside transport [6].
Based on the works of a number of domestic scientists [7, 8, 9, 10, 11], as well as our studies [12, 13, 14, 15, 16, 17], we consider it appropriate to evaluate the quality of transport services by the relative values of the following indicators:
- the speed or time of cargo delivery;
- safety of the transported goods;
- full satisfaction of the demand for transportation;
- regularity or rhythm of cargo delivery;
- complexity of transport service;
- transport availability of the territory;
- transport accessibility of users;
- transportation safety;
- environmental friendliness of transport.

For specific goals and objectives, this scorecard can be appropriately transformed. Assessment of the level of transport service quality can be carried out at different levels of management, depending on the goals, subjects and objects of analysis.

In connection with the growing importance of improving the customer service quality under the conditions of increased competition in the rail transportation market, a group of Russian scientists with the support of the transport sector media has now developed an all-Russian project called Quality Index. Since 2012, surveys of a representative sample of cargo owners are carried out monthly (from 2016 — quarterly) in order to determine cargo owners’ satisfaction with the quality of transport services for a number of indicators. Based on the results of the survey and their analysis, monthly reports are prepared; experts from the scientific group periodically prepare papers for the press with an analysis of the obtained data [18].

In the course of the process investigation, consumers evaluate the quality of products and services, pricing policy, additional services and special offers in the cargo main railway transportation market. The results obtained are compared for different periods, their dynamics is evaluated, incl. by year and month. Technically, the gathering of respondents’ opinions is carried out by exercising questioning and interviewing procedures. In the study of the business process, top and middle managers of companies that are users of services in the cargo main railway transportation market take part.

As part of the survey, respondents are invited to provide an expert assessment of the current state of the business process according to individual criteria on a 100-point scale with appropriate levels of assessment: 0–25 points — “unsatisfactory”, 25–50 — “low”, 50–75 — “average”, 75–100 — “high” (the participants in the study were informed that their score corresponds to one or another level of assessment).

Dynamics of values of the overall Quality Index for the period from 2011 to 2018 is presented in Figure 2.
The figure 2 based on the analysis of expert estimates, an index of general satisfaction with the quality of services (or quality index) is calculated, which is an integrated indicator that summarizes all the estimates and is calculated as arithmetic mean (without taking into account the significance of individual indicators).

4. The discussion of the results
According to forecasts of the World Trade Organization, the decline in world trade growth regarding the GDP growth continues. Significant role in slowing the development of trade is played by the processes taking place in the Chinese economy, in particular the reduction in growth rates and the transition from the investment growth model to growth due to consumption. The investment model provided an outperforming growth rate of imports of raw materials, primarily coal, oil, ore and metals, that stimulated the growth of trade.

Another factor that determined the slowdown in trade growth was the reduction in the growth rate of global investment demand. According to the World Bank, low oil prices (for oil-exporting countries), a fall in foreign direct investments (for importers of commodities) and political risks are the reasons for such a reduction.

The impact of the above factors is exacerbated by the fact that trading countries continue to introduce new restrictive measures. The number of such measures introduced by WTO members since 2009 exceeded 2.5 thousand, and the number of restrictions lifted during the same period was only about 1.4 thousand. Most of the imposed restrictions are anti-dumping measures, with the most of it falling on the metallurgy and chemical industries. The G20 countries are also introducing protectionist measures in the form of state support for individual sectors, primarily infrastructure and agriculture.

The development of integration and business activity as prerequisites for the growth of the volume of transport and logistics services in the 1520 space are significantly affected by the indices of business confidence.

The index shows that in most countries, managers are quite cautious in assessing the short-term prospects for building up positive processes and do not expect a significant improvement in the business and investment climate. The current situation with macroeconomic dynamics does not allow us to rely on the development of the transport and logistics services potential of 1520 space countries without implementing measures to improve efficiency in the following areas:

- development of logistics as an integrated supply chain and development of outsourcing in logistics;
- investments in transport and logistics infrastructure;
- development of container transportation;
creation of a barrier-free environment and the development of digital technologies in logistics;
improving and harmonizing the tariff policy of countries;
the formation of new logistics products and solutions [19].
Significant opportunities lie in the development of high-speed rail transport, supplemented by a system of highways, inland waterways and multimodal logistics chains.
One of the key elements in the organization of cross-border document management is a single platform that allows you to generate, process and store a set of information about the transportation process and legally relevant transportation and accompanying documents, ensuring interaction with all participants in the transportation process, either through providing access to the system or through organization of integration with the information systems of the participants in the workflow.
As a pilot for the Electronic Container Transportation project, PJSC TransContainer together with DB Schenker, DB Schenker Rail Polska S.A., Belarusian Railways and JSC Russian Railways organizes processing of electronic shipping documents (simultaneously with paper documents) when sending a container train from Germany to Russia using CIM/SMGS.
The use of information technologies creates new horizons for improving the efficiency of transport and logistics services.
According to the results of evaluating the performance of transport service quality indicators, it can be seen that over the course of 7 years, the value of the Quality Index, which summarizes consumers’ assessments of the services quality level in the cargo main railway transportation market, has changed ambiguously: since the beginning of the study, there has been a significant increase in the overall quality level (from 50 points in 2011 to 68.8 points in 2015), which is due to the “low base” effect (liquidation of the inventory fleet of wagons of JSC Russian Railways and the transfer of services for the provision of wagons for transportation to carrier operators, whether independent or affiliated to the Russian Railways holding), as well as due to the efforts undertaken by government regulators and JSC Russian Railways to develop market mechanisms and improve the customer focus of the industry. Then, in the period from 2016 to the present, there is a negative dynamics of changes in the overall Quality Index (decrease to 60.5 points), which is caused by the fact of instability of tariffs for transport services, which are taken into account as a part of the composite Index, as well as by the shortage of railway rolling stock.
The main factors that will determine the quality level in the medium and long terms are the following:
- the balance of the wagon fleet, determined both by the economic situation and by regulatory decisions of public authorities;
- the dynamics of the railway infrastructure development (the length of the railway network has remained almost unchanged since 1991, while the structure of the economy, the geography of production and consumption, the volume and structure of foreign trade have changed dramatically over this period);
- the pace and level of implementation of strategic documents on the development of the transport complex of the Russian Federation.

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