

Transport Logistics as a Tool of Interaction Between Transport Streams

Z. M. Ilaeva^{1,*}, D. Sh. Alikhadzhieva² and M. Ya. Pashaev²

¹Kadyrov Chechen State University, Sheripova Street, 32, 364024, Grozny, Russia

²Grozny State Oil Technical University, Kh. Isaev Ave., 100, 364061, Grozny, Russia

Abstract. State policy should be aimed at subsidizing the modernization of traffic flows, which will increase volumes and added value, should also be aimed at encouraging, reducing barriers for logistics companies that not only increase the export of goods, but also the export of services. Thus, this allows increasing GDP per capita and will lead to an increase in the instruments of interaction between transport flows. The article considers the countries that have significant potential to learn from the policies that perform best around the world. From the point of view of traffic supply, i.e. the market for logistics services, countries should be able to attract important interaction activities between traffic flows, which can contribute to further goals of transport logistics optimization. In general, it can be said that global value chains have a positive effect on the number of companies, because the more a country imports and exports a finished product, the more personnel it needs, if we are talking about services, then companies also need highly qualified personnel and thus there will be a higher level of service.

1 Introduction

In modern conditions, the economic activity of the market, as well as its integral component of trade, is gaining momentum, acquiring more and more complex forms of commercial interaction between different parties, using the services of third parties: intermediaries, agents and representatives.

The environmental aspect, which currently needs to be taken into account, takes into account the impact of the activities of companies on the environment.

During the pandemic, road transportation from China began to develop, their routes generally coincide with the railway - through Zabaikalsk and the Kazakhstan-Russia border crossings. With the introduction of a ban for Belarusian and Russian carriers to operate on the European market, road transport from China began to develop more actively, more carriers appeared in this direction, most of them previously traveled to Europe.

Due to the growth in traffic during this period, the delivery time also increases, as there is an additional burden on the entire logistics infrastructure. This trend is especially intensified in December.

*Corresponding author: zarema-ilaeva@rambler.ru

Rail transport - for recently completed and arriving railway orders, we now maintain 30-35 days from the moment of picking up the cargo until the moment of arrival at the destination station. For new ready orders, the next exits at the end of December - beginning of January + transit 30 days, the total estimated period from the moment the cargo is ready to arrive at the station will be 45-50 days, taking into account the expectation of the exit. The average freight cost for a 40 container today on the China - Moscow region route is about \$11,000.

One way or another, today it is the most reliable, safe and predictable way of delivery from China.

Multimodal transportation through the ports of the Far East - the total delivery time is 50 days or more. The cost is about the same as on the railway.

The final delivery time depends on many factors:

1. Which line is lucky on the route China-Far East. The term of acceptance of the vessel for processing at the terminal of the port of destination (waiting on the roads), the term of container processing depends on the line.

2. Which terminal the container arrives at (VMKT and Sollers terminal processing times are longer than at VSK).

3. The quality of the work of the forwarder who organizes the export of the container by rail from the terminal in the port.

Sea transportation - there are places from China at the end of December, someone has 2 days of raids, someone has 15, the average time of a raid is 10 days, the waiting time for a train to leave the same terminal is really increased and averages 20 days or more, in Vostochny 10 days, if taken out from third-party stations - about a week of waiting. That is, the average time for the sea, if the cargo is ready now, will be an average of 70 days, taking into account the waiting time for the ship to leave until it arrives at the station in Moscow.

Road transportation - the delivery time is difficult to predict, because it depends on the speed of border crossings. Border crossings have a capacity that does not meet modern needs (the Zabaikalsk checkpoint, for example, can pass up to 120 cars a day), their work is also most dependent on lockdowns in China. Today, it takes from one to two weeks to pass automobile border crossings, the total delivery time varies between 35-40 days. The cost of 82m3 on the route China-Moscow region is about \$21,000.

In January 2023, after the New Year holidays in Russia, the period of holidays almost immediately begins in China - on January 22, the year of the Black Water Rabbit is celebrated in the Celestial Empire according to the eastern calendar. Such a high density of holidays will certainly have an impact on logistics - those who do not have time to take out their goods by the beginning of January, most likely will not be able to do it until the first days of February. Suppliers to China will begin to let their employees go on New Year's holidays from January 15, shipments will be delayed.

In this regard, we do not expect a critical shortage of any goods; most importers take into account holiday schedules in their loading plans. Yes, and Chinese suppliers will rush them, because they are not interested in the accumulation of goods in their warehouses.

2 Research Methodology

There are different ways to analyze the world economy. One is to view it through the lens of growth and structural change in individual economies, developed and developing. The second is to use the prism of global value chains, the complex network structure of the flow of goods, services, capital and technology across national borders. Both are useful and complement each other. In this study, we will explore precisely through the prism of global value chains.

Later in the article, we will look at some of the factors that are supposed to influence the participation of companies in traffic flows, and check if this is really the case. In terms of research methodology, we will explore our data using econometric panel data techniques.

Panel data is a spatial sample of objects traceable in time [1]. Their use provides a number of advantages in estimating the parameters of regression dependencies, since they combine both the analysis of time series and the analysis of spatial observations. Panel data are more difficult to collect than spatial or time series data because a study requires a set of variables that need to be collected over the entire period. Using such data, it is possible to compile a high-quality balanced panel for building models, so the study was conducted on panel data and has balanced data.

Also, panel data have significant advantages over individual temporal or spatial data. First, it is obtaining the most reliable estimates of the parameters in the model due to the fact that the panel data has more degrees of freedom and more sample variation. Secondly, they allow you to analyze many economic issues. Thirdly, this type of data is able to take into account the “individual component” of the object, which includes all the factors omitted in the model, by tracking changes both by objects and over time. This helps to avoid the problem of endogeneity associated with the omission of variables [2].

More than two thirds of world trade is carried out through global value chains, in which production crosses at least one border, and usually many borders, before final assembly. of the world, which was facilitated by the reduction of transport and communication costs and the reduction of trade barriers. In order to assess the impact of changes in the structure of transport logistics in different countries and to see the involvement of countries in transport logistics, there are indicators such as direct and inverse indicators of participation in the interaction between transport flows.

Thus, at present there are very few scientific studies related to the study of various effects from the participation of countries in transport logistics. But let’s try to consider the effect now, because both the effects and the factors (a - fixed costs necessary to carry out a certain volume of transportation; b - transportation distance; c - traffic volume) play an important role. (Table 1).

Table 1. Identification of economic damage in transport logistics

Kind of transport	Cargo	Railway
Directions	Short	Long
Length	1785	1234
Transport costs, %	37.6	49.5
Economic damage, rub.	7,002.35	5,509.81

Based on the revealed effect, we can conclude that access to new technologies, competition, productivity growth, economic growth, diversity of goods, creation of new jobs, increase in gross domestic product and many others are considered as the effect of traffic flow optimization.

This phenomenon has led to the reorganization of the system of international economic relations and the transition to new statistical databases that allow estimating trade flows not as the cost of goods exported or imported by the industry, but on the basis of value added. This makes it possible to create a fundamentally new analysis that allows you to evaluate the participation in transport logistics for various countries. In this regard, the study of both factors and effects takes on a particularly important character. Today, there are a number of methods of statistical analysis that, when used correctly, give highly accurate quantitative results.

3 Results and Discussions

GDP growth rates have a weaker, but also significant and positive impact. The level of development of traffic flows, investments have a significant impact. As well as a positive impact on the interaction between traffic flows, which improves financial conditions and is

in line with the development of international business and, therefore, an increase in participation in logistics operations.

In EU countries, GDP growth rates, investment in R&D, investment inflows, investment intensity, the share of high-tech products in exports and property rights have a positive impact on participation in logistics.

Based on the above, it can be concluded that the index of participation in transport logistics differs between EU Member States, where the group of main other EU Member States has higher scores than the southern members. The most important factors for participation in transport logistics include the growth of GDP, investment, the development of the financial sector, the share of services in GDP and the share of high-tech products in exports, as well as the level of wages.

Different countries contribute differently to the global value chain. The most developed countries have approximately equal ratios between foreign and national value added. The United States, China and Germany generate the largest absolute volume of national value added. Moreover, the values for these three countries are approximately equal and significantly higher than for the rest.

Dynamics of global value added for the period 2005-2015 was positive (except for 2008-2009 and 2015).

The emergence of traffic flows in the field of logistics has significantly changed the nature and structure of the world economy (Fig. 1).

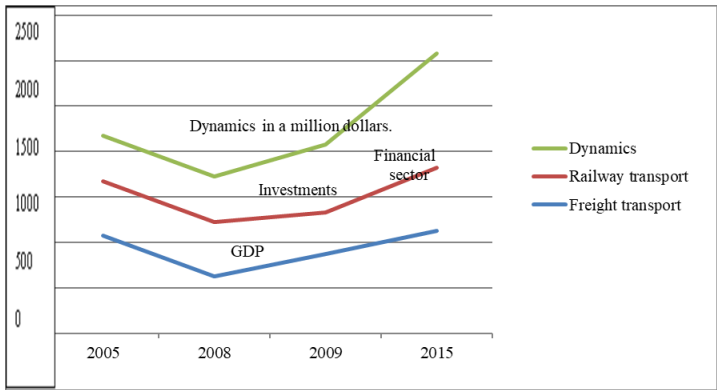


Fig. 1. Distribution curve of traffic flows in the structure of macroeconomics.

The y-axis shows the level of value added that a country or firm receives from participation in one or another link of internationally fragmented production (in one or another link in the value chain). The x-axis represents the various stages of the manufacturing process, from R&D and product development to its sale to the end user.

There are many graphic options for the “smiling curve”, but their essence boils down to the fact that different stages correspond to different added value: the largest share of the added value can be obtained at the stages of product development and distribution (“upper corners of the smile”), and the smallest share in the lower segment of the “smiling curve”, in the production stages, as the highest competition.

The result has been a surge of publications on the subject of logical traffic flows since the 2000s, which indicates the high importance of this phenomenon in the global economy and the need to study it. Among the most significant works of foreign researchers are such authors as Sturgeon [3], Elms [4], Hummels [5], Kaplinsky [6], Koopman [7], Taglioni and Winkler [8]. In the domestic literature, it is worth noting the publications of N.A. Volgina [9, 10], V.B. Kondratiev [11], T. Meshkova and E. Moiseicheva [12].

The value of distribution companies in the field of traffic flows lies in its network of outlets. The manufacturer develops contract prices for bulk purchases with the distributor, and the distributor sells the products to its retail customers. This allows the manufacturer to deliver its products to a wide

network of retail outlets without the cost of maintaining this very network. Sales organization involves customer service and support.

To assess the impact of changes in the structure of trade deliveries in different countries and to see the involvement of countries in the logistics of transport deliveries, there are indicators such as direct and reverse indicators of participation in logistics, the share of the cost of foreign components (foreign value added) used in the production of export products of a given country [13].

Speaking in detail about the introduction of the latest tools in logistics, now at the stage of data analysis it is possible to integrate almost step by step. The vast majority of goods that are transported through logistics networks are in protective packaging. The industry uses a large number of disposable packages in specialized or universal reusable containers. The design, monitoring and management of packaging and containers pose a number of challenges to the industry. For example, the development of trade stimulates demand, seasonality, volatility and variety of packaging types. This leads to the accumulation of waste due to inefficient use of volume (Fig. 2).

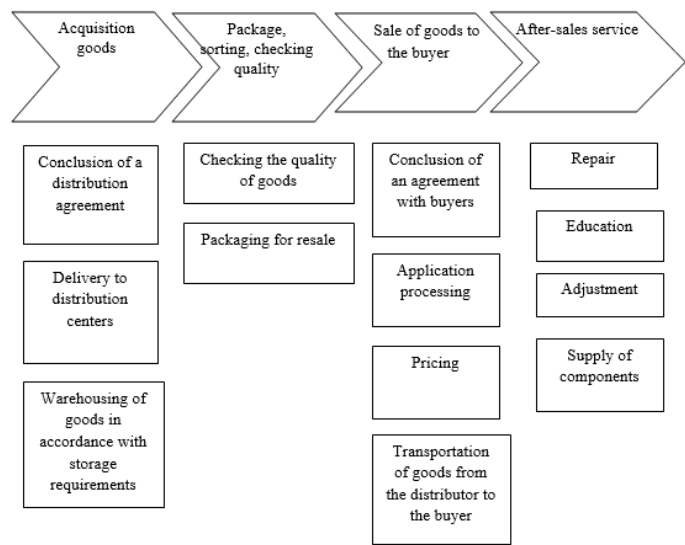


Fig. 2. A chain of tools for interaction between transport streams

Let’s consider another of the tools for interaction between traffic flows, these are specialized portals - they are the most effective for sales. SEO or search string - is a separate and independent touch point like advertising or E-Mail, the weakest in terms of audience size, but the most effective among interested people, because only an interested person will come from the search.

Social networks - in terms of efficiency, comparable to exhibitions, conferences and webinars, because there is already an interested client, as well as a visual demonstration of the product.

4 Conclusions

The application of transport logistics can help develop products that are stronger, lighter and more sustainable. Companies are currently exploring a number of new tools, including compostable plastics and highly recyclable materials after consumption.

If the product transport flow chain has already been created, then the data can be easily obtained through the description of its data. Otherwise, item data may be generated during labor preparation using 3D scanning. The combination of product and warehousing data will help companies improve efficiency, for example by automating packaging selection and container packaging strategy.

New products can have a significant impact on the design, operation and optimization of logistics infrastructure such as warehouses, distribution centers and transfer facilities. They

can combine a 3D object model with IoT data collected from connected storage platforms, as well as inventory and operational data, including characteristics such as size, quantity, location, and demand for each object.

Logistics infrastructure, warehouses and distribution centers are only a small part of the entire logistics infrastructure. The flow of goods to their destination depends on the organization of many elements of the supply chain, including ships, trucks and aircraft, ordering and information systems, and, above all, people. This complex, multilateral system is most visible in the world's major logistics centers such as airports and container ports. Today, the problem of efficient operation is acute at these sites, complicated by the imperfection of information exchange systems, which can be prone to errors and delays.

In the global logistics network, the application of new tools will model the entire network, including not only logistics assets, but also oceans, rail lines, highways, streets, and customers in homes and workplaces. The idea of such an all-encompassing movement, at present, is largely the pursuit of optimizing the logistics industry.

Acknowledgments

The article was prepared with the support of the RFBR grant, project 20-010-00383-A "Development of methods for managing environmental and economic costs in the system of a warehouse complex based on the use of information technologies"

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