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Tendencies and Regularities of Russian Regional Transport Systems' Development

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ABSTRACT

The article describes the methodological approach to the analysis of trends and regularities of development of regional transport systems (RTS), the estimation of the degree of influence of the spatial socio-economic system (SSES) of the state of the RTS was conducted, using the authorial complex models of correlation and regression analyzes, allowing to identify the determinants of their functioning within the context of the Federation groups of factors, determining the functioning and formation of RTS as a structural part and economic space in the region, and industry sector. The author emphasizes the specific features of the RTS as a subsystem of SSES. As a part of the methodological foundations of RTS research, author highlights the main elements of the analysis, justified the use of the integral characteristics of the RTS (risk and efficiency) as the key ones for a strategic planning and the basis for their calculation is discussed in details - methods of analysis of the spatial development of the RTS.

Keywords: Regional Transportation Systems, Comparative Analysis, Correlation and Regression Analysis, Spatial Socio-economic System, Regional Socio-economic System

JEL Classifications: H54, R41, R42, Z13

1. INTRODUCTION

Studies of the regional industrial subsystems, their methodology, tools, approaches, despite some similarities, differ substantially depending on a specific industry sector and the existing information base. A number of studies focus on individual local markets (Berezhnoy et al., 2014), on the subsystems of the RF subjects (Fetisova et al., 2014), on the technical features of the functioning of the regional branch systems and subsystems (Meskon et al. 1992, Raimbekov et al. 2014, Roshin and Golskaya 2011).

However, in a fast-changing environment and the use of probabilistic and adaptive approach within management systems (Shalbolova et al. 2014; Kochiev et al. 2003; Prudskiy and Elohov, 2011) there is a need to develop a methodical approach

and its validation for specific industrial subsystems of the economy in the context of federal subjects.

Regional transport system (hereinafter - regional transport systems [RTS]) is a functionally-structural subsystem of the spatial socio-economic system (SSES) and the subsystem of the regional SES (RSES) for the following reasons (Berezhnaya and Kiselyeva 2012; Berezhnaya 2012):

- Transport - a material frame of RSES, in nodes of which major transportation hubs are located, urban agglomerations;
- The organization and functioning of the RTS is closely related not only to economic conditions, social aspects, but also with relief features of the territory;
- As a part of the economy of the region (i.e., an element of RSES), RTS is not limited to the physical and material terms

only by boundaries of subjects. It serves as a link that connects the different regions with each other;

- d. RTS cannot be viewed in isolation from the interregional relations, but at the same time the development of certain infrastructure objects and local carriers influences the level of development of a particular region.

The complexity and contradictions of the role and functions of the RTS at space, territorial and regional SES determines the difficulty of collecting and processing of information about their functioning. In a number of sources (Regions of Russia, 2011, 2012, 2013; Transport and communications in Russia, 2012) the data are sketchy, the methodology of calculation over the years varies considerably, the context of representation of the object is subjected to transformations in accordance with the transformation of the administrative boundaries (e.g., the formation of the North Caucasus Federal District [NCFD] in 2010) or modernization of classifiers (ARCTA until 2004, and RNCEA, which has replaced it and is regularly modified). Specificity of the registration of a number of transport indicators is so that in total for the Russian Federation data are included, which is not distributed by region, that is in some cases more than 10% of the total volume of origin of goods, transport of goods by road and rail, etc.

The above mentioned determines the need for an in-depth analysis of the functioning of certain sectors of the economy, including the study of the methodological foundations of the formation of the original data and their correct use in the modeling industry functioning SES, which include RTS.

2. METHODOLOGY

Analysis of the level of the spatial development of the Russian RTS made it possible to identify groups of factors determining the functioning and formation of the RTS as a structural part and economic space in the region, and industrial sector:

2.1. Groups of Factors that Govern the RTS Functioning and its Development as a Structural Part of the Economic Space and the Industry (Bures, 2003; Deruzhinsky et al. 2014)

In our opinion, within the formation of the RTS development strategies the following groups of factors that determine its operation and development as part of the structural and economic space and the industry should be considered:

1. Status and trends of development, spatial development strategy of SES, on the territory of which the RTS operate. In this group, the earlier discussed provisions on RTS as part of SSES of factors are reflected, which by its geographical, spatial features can affect the territory of not only one but several subjects of the Russian Federation. Level of development, regional strategic plans require the development of new and modernization of old highways and components, i.e., define the main targets of the transport;
2. The spatial structure of the economy of the region(s), namely: The presence and/or the formation of regional clusters, hubs, transport corridors passing through the territory, the

presence of large agglomerations, special economic zones, the position of the region on the international borders, the presence/absence of outputs to the sea, rivers, relief et al. (Berezhnaya, 2012). The spatial structure determines the main directions of development and modification of transport routes (for example, the formation of clusters necessitates the development of access roads and transport links within the cluster, the largest metropolitan area determine the need for development of passenger transport, etc.) creates space, interdependent with the level of development of transport (transport hubs, centers around the production and trade, transport corridors - the "axis of development," etc.). Border regions require the development of areas of ITC passing through them, improving road and railway lines passing into foreign transport routes. Improvement of transport will allow the best use of the transit potential of the subject.

However, transport systems (in particular rail, road, pipeline) are different from other regional and industrial systems by the level of connections and dependence of transport development level in the neighboring federal subjects, and therefore the development of the RTS strategy should be formed, taking into account the spatial features of at least one federal district and as maximum - in cooperation with the federal district and neighboring states;

3. A risk level of functioning and development of the RTS. Risks of the RTS are determined by a number of factors: Economic, political, legal, technological and others. A stochastic nature of the functioning of the RTS, which was discussed earlier, is a consequence of not only the development of the RTS, but also the impact on its environment (industry, region, peace, etc.). Risks presuppose random fluctuations operational of the RTS operational environment as for the worse as for the better, so their registration is necessary in the formation of development strategies. It is necessary to take into account both positive and negative effects of risks;
4. Presence of risks and their evaluation presupposes the assessment and the results of the operation of the RTS in the framework of the implementation of a development strategy. In our opinion, under the conditions of high inflation, instability of the economic environment special attention should be paid to not absolute targets (as it is usually done in the traffic and regional strategies under formation), but to relative ones, which will evaluate the efficiency of the implementation of these or those technologies, investments, development of certain sections of the transport network of regions, clusters, and so on. Evaluation of such effectiveness of this RTS is reasonable as a part of a comparison with the closest transport systems - close both geographically and in terms of the development level. Indeed, setting targets at the RTS level, which is much more developed and focused on other economic benefits of the neighboring RTS (e.g., when comparing the RTS of Kalmykia and the Krasnodar territory) will lead to the inadequacy of the goals of their meaninglessness for the RTS and inaccessibility due to available resources. Therefore, before you conduct an assessment of the expected efficiency, the RTS development typology is needed, as well as mesic environment (region, neighboring regions), the level of risk, and other factors.

Thus, based on the earlier analysis of the essential characteristics of the RTS as spatial stochastic subsystem of the economy, as well as the analysis of the current approaches to development strategies' formation, including spatial, there were identified the key factors that must be considered when developing strategies for the RTS.

2.2. Methodological Bases of the RTS Research

Methodological bases of the RTS research include the following elements:

1. Identifying trends and patterns of development of transport systems in regions, assessment of the impact of SSES on the state of the RTS
2. Identification of the territorial factors of economic risk operation RTS and implementation of their integrated assessment
3. Evaluation of the efficiency of the RTS functioning.

The results of the research in this aspect are the basis of the formation of the strategies of the RTS spatial development.

It should be noted the main reasons for use as integral indicators of the analysis of the functioning of the RTS and evaluation of the factors of economic risk and efficiency:

1. Risk and functional efficiency of the RTS reflects two main interrelated and opposite characteristics of any system: Loss probability and level of performance. These characteristics are of strategic importance for the functioning of the RTS, as well as for other systems;
2. Indexes are expressed in relative values, which ensures comparability of objects that differ in scale of absolute values;
3. Indexes accumulate the influence of many local factors and are integral.

The technique of analysis of the spatial development of the RTS includes the following elements (Berezhnaya, 2012):

1. Analysis of inter-regional transport and economic relations of the regions as a basis for spatial integration
2. Comparative analysis of the level of development of the RTS in the socio-economic space of the Russian Federation
3. Analysis of the degree of influence of the main characteristics of the SSES on the state of the RTS
4. Forecasting trends in the development of the RTS and its external environment.

3. RESULTS

The results obtained using the above presented analysis techniques of the level of spatial development of the RTS are shown below.

3.1. The First Element of the RTS Research - Analysis of Inter-Regional Transport and Economic Relations of the Regions as a Basis for Spatial Integration - Includes the following Items

3.1.1. Analysis and evaluation of the functioning quality of the international and interregional relations of the Russian Federation

The analysis of inter-regional, transport and economic relations of the regions as a basis for spatial integration include:

- a. Determination of the boundaries of the macro-, meso- and micro- functioning of the RTS;
- b. Identification and assessment of the level of development of transport nodes, corridors and areas adjacent to them, "growth points" in the economy SSES, local economic clusters.

For the most complete and adequate registration of the traffic transport volume in the region, in our opinion, it is necessary to conduct an analysis of the relationship of a number of regions and include export and import flows into this analysis. On the one hand, the statistical methodology of traffic registration does not allow a double counting in the observations and shows the volume of traffic, associated with the shipment of goods of regional production; on the other hand, this approach takes into account the strong economic and transport connection of the regions with each other.

To carry out this analysis, it is first necessary to determine the spatial boundaries of interconnected RTS. Most logical is conduction of the analysis in the context of a specific economic region, and not within the official boundaries of federal districts, which allows taking into account the established inter-regional relations. For example, it is inappropriate to analyze transport links of only the North Caucasus Federal District in isolation from the regions of Krasnodar Region, Rostov region, etc., as North Caucasus Federal District and Southern Federal District have a long and strong transport and export and import connections.

3.1.2. Analysis of international transport corridors crossing the territory of the subject

These aspects of the analysis are closely interrelated. Below is an example of research of international transport corridors, crossing the territory of the subject at the federal level. For the analysis of the spatial structure of the RTS it is appropriate to use the visual analysis in addition to the study of digital material. Graphic (visual) interpretation of results is optimal for the evaluation analysis.

The territory of the Russian Federation crosses two large ITC: North-South, covering the European part of the territory, and the East-West, crossing the European and Asian parts of Russia. Major domestic transport nodes are located on main ways ITC: Kaliningrad, St. Petersburg, Moscow, Rostov-on-Don, Nizhny Novgorod, Samara, Yekaterinburg, Novosibirsk, Vladivostok. These points are not only the largest centers of transport development, but also the economy of "its" and the neighboring regions.

Study of investment ratings of the regions confirms the theoretical position that the areas, which are between the poles of growth and which provide transport links, receive additional growth impulses due to the increase in traffic, diffusion of innovations, and development of infrastructure. Regions, located away from the main land transport routes, which do not have access to long-term sea river basins, have the lowest investment ratings (Konik and Ostanin, 2008).

However, it is clear that, despite the correlation between the density of the main traffic arteries and the level of development of the

subjects of the Russian Federation, a number of regions falls out of this pattern due to the nature of the economy as a whole: Resource-extraction subjects of the Russian Federation are investment attractive, but climatic, geographic, socio-demographic factors lead to low level of major highways, except inland waterways (subjected by seasonal fluctuations) and pipelines (closely related to the resource potential of the region).

3.1.3. *The study of the work of the major transportation nodes in the region*

A large number of transport units represented in the previous figure, their variegation and specificity, depending on the subject suppose the conduction of the analysis in the context of specific areas and SSES. Let us consider as an example of such an analysis the study of transport space of the regions of the South of Russia (SFD and NCFD). In our opinion, despite the official separation of these two federal districts, they have close economic and social ties.

It is obvious that in the area a shift is observed:

- a. Of the transport nodes in the direction of the Black Sea and the Volga river, which is natural, since in these areas is access to international markets and access to the key waterway of the European territory, which is part of ITC "North-South";
- b. Of the density of railway tracks at the same direction;
- c. Of the density of roads in the direction of the North Caucasian republics, due to their small territory and problematic development in mountain areas of vehicles other than the automobile.

Apart from the regarded aspects of this analysis, there may be considered parameters of the transport mobility of the population, exports and imports. Such an analysis is appropriate to be carried out on materials of migration services, with pointing out the specific areas and economic activities of the economically active population.

The main problem of the analysis is poor amount of statistical information on foreign trade of the Russian Federation in the federal districts and often an unnecessary detailed elaboration on the level of the subjects, which may vary from region to region.

3.2. Comparative Analysis

Comparative analysis of the level of development of the RTS in the socio-economic space of the Russian Federation subjects (Berezhnaya, 2012) presupposes the analysis of their relative characteristics. In our earlier studies (Berezhnaya, 2012) there were examined the functioning of the RTS, the extent of transport in the region per capita, rates of investment in fixed assets and depreciation of fixed assets RTS in comparison with the similar indexes in the regions in the whole and others.

The statistical analysis was conducted for the period of 2000-2014. The interval choice is associated primarily with the main general economic trends: In the period from 2000 to 2008. Russian economy has developed relatively stable since the 1998 crisis, and after the next international financial crisis of 2008 there was a sharp decline of a number of indexes in 2009, followed by their sustained growth from 2010 to the present.

It should be noted that the functioning of the RTS is closely associated with the development and operation of the regional economy as a whole. Therefore, the index system should include two subsystems:

- a. A subsystem of indexes to measure the external (macro- and meso-) the RTS operating environment;
- b. A sub-system of indexes for the analysis of internal (meso- and micro-) the RTS environment functioning.

The first subsystem includes absolute and relative indexes characterizing:

1. Macro level:
 - Development trends in the world economy (GDP, global markets' data, etc.);
 - General level of economic development of the country; federal district (the country's GDP, the total GRP of a federal district and its structure, the dynamics of incomes and living standards, etc.);
 - Trends of functioning of the transport industrial sector (traffic volumes, number of passengers, the quality of highways in the country, etc.);
2. Meso level:
 - General economic development trends of an analyzed region (s) of neighboring subjects (GRP, the dynamics of income and living standards, etc.);
 - A level of development of industries that interact with the transport industry (production volume, a level of technological development and financial condition of agriculture, engineering, industrial production, trade, etc.).

The second subsystem includes absolute and relative indexes characterizing:

1. Meso level
 - Traffic volumes, turnover, number of passengers, passenger turnover and other components of the transport system in a region;
 - Level of development of transport infrastructure in a region;
 - Financial condition of the transport companies in a region;
2. Micro level
 - Financial condition of the transport organizations in a region;
 - State of the material base of transport companies in a region;
 - Labor resources of transportation companies in a region.

The analysis of these indexes is conducted:

- a. In the context of the absolute values (traffic volumes, production, etc.) that allows comparing the scale of development of transport systems of different regions;
- b. In the context of the average values (the average wage, the average level of depreciation of fixed assets, etc.), allowing comparing the performance of the transport system in the region not only with neighboring subjects, but also with other industry systems;
- c. In the context of the relative values of the dynamics, structure, making it possible to track changes in indexes over time and

structural shifts, as well as to determine the location of the RTS in the regional economy.

Sectorial structure of the RTS in the subjects of the Russian Federation greatly is differentiated. For most subjects the predominance of number of enterprises of other land transport (in particular automotive) and organizations is typical. These organizations are involved in the transportation management, cargo handling, storage, supporting and auxiliary transport activities. So, in the Volga Federal District (VFD) and Ural Federal District (UFD) on other land transport accounts for more than 50% of organizations.

However, the financial results differ significantly by industry: For Central Federal District (CFD) revenue of activity results of the rail transport (48.44%) is typical, for Far Eastern Federal District (FEFD) and the Northwestern Federal District (NWFd) - enterprises, specializing in auxiliary activities and the organization of transport; for VFD, NCFD, Siberian Federal District (SibFD) and UFD - pipeline transportation. Obviously, such an industrial structure is primarily concerned with resource specialization of the economy, and if in FEFO and the NWFd transport organization is an integral part of international traffic, but for other regions such actuality is missing, which determines a large share of pipeline transport in the index. A small number of organizations of pointed industrial sectors reflect a monopolistic nature of the commodity sector, particularly in a field of transport.

In the majority of subjects of the Russian Federation the main kind of transport is rail and road considering a significant extent of the land territory of the country, transit location on the route of ITC "West-East," the absence of waterways and air transport infrastructure underdevelopment. If water transport is present in less than half of the subjects (in NCFD is completely absent), sea - <15% of the subjects, and the air in most cases is represented by local airports, the rail transport operates in all regions, with the exception of ChAR, the Kamchatka Region, Tyva Republic and Altai. Similarly, the road transport sub-sector operates in all regions. This differentiation depends primarily on a geographical location of subjects, but in no way does not reflect the impact of the operation of transport and the level of risk.

Differentiation of the other kinds of transport is determined by a geographical specificity of subjects. For far located federal districts - SibFD, FEFD - as well as for one of the most developed - NWFd - a high level of performance of air transport is typical, whereas in the SFD, VFD, CFD and UFD other land transport prevails.

Comparative analysis of the level of development of the RTS in the socio-economic space of Russia requires consideration of the relative characteristics of transport systems of the regions (subjects of the Federation and the federal district).

In the calculation the dynamics of the volume indexes of the RTS activity is included, the extent of transport distribution in the region in per capita. The results characterize the degree of development of the RTS by federal districts and subjects, may detect the lagging

and leading RTS, the subjects, for which transport is one of the key industrial sectors, and subjects, in which transport in connection with a minor role in the region in the inter-territorial exchange has not received a significant development.

Obviously, the leaders in the field of transport are CFD, VFD, SibFD. The share in the administration of goods by the rail transport of SibFD is due to a significant specific weight of the Kemerovo region in this index (more than 16% of Russia's cargo volume). The largest share in total freight transport of the same district provides Krasnoyarsk region, Irkutsk and Kemerovo region. It should be noted that within the federal districts can be identified the leading regions for cargo volume indexes, both by road and rail transport. So, in the CFD it is Moscow and Moscow region, in the NWFd - Leningrad region, St. Petersburg and Murmansk region, in the Southern Federal District - Krasnodar Territory, in the North Caucasus Federal District - Stavropol Territory, in the VFD - Republic of Tatarstan, UFO - Tyumen region, in FEFO - Primorsky Krai and the Amur region.

For subjects of the European part a high density of lines of communication is typical, while the vast territory of Siberia and the Far East is not enough mastered, which determines the lowest level of these indexes.

Apart from the standard analysis of the dynamics and structure of the traffic on the main kinds of transport (FSSS provides thoroughly information only on road and rail transport), it is advisable to carry out a study by the estimate indicators on the basis of a complex analysis of data from various sources about the location of the RTS in the Russian Federation subjects; about sectorial indexes of transport in comparison with general economic for a particular region; on the financial performance of organizations.

Table 1 shows the results of the complex analysis of related indicators of the RTS functioning: Investments and fixed assets.

3.3. The Analysis of the Degree of Influence of the Main Characteristics of the SSES

The analysis of the degree of influence of the main characteristics of the SSES in the state of the RTS, we carried out using complex models of correlation and regression analysis, which reflect the closeness of the relationships between the characteristics of the functioning of the RTS (traffic volume and turnover) and indicators, characterizing the activity of industrial sectors, served by the RTS; populations, income and transport mobility of the population.

The analysis was carried out in the context of each Federal District and the subjects of Russian Federation for the period of 2000-2012 by the quarter. In a number of subjects some individual modes of transport are not functioning. In all the regions only road transport is functioning. Based on the parameters of its operation, it was decided to build a regression model, reflecting the impact on the turnover and the volume of transportation of those sectors of the economy, which are most often used in its road transport activities (agriculture, construction and trade).

Table 1: The characteristics of fixed assets and investments into RTS basic capital (fragment, South Russia) (composed on a basis of [Regions of Russia, 2011, 2012, 2013; transport and communication in Russia, 2012; UISS])

Region	Weight of the RTS in cost of the basic funds of a region %, 2011	An average investments' growth rate in the RTS, %, 2011/2006	Investments' share in the RTS in the total investments' value in a region, %, 2011	Extend of wear of basic funds in RTS, 2011	
				Region	RTS
Russian Federation	28.4	125.3	24.8	46.3	37.9
SFD	31.1	134.8	29.1	43	40.8
Republic of Adygeya	13.7	129.8	17.9	46.5	67.6
Republic of Kalmykia	56.1	160.3	46.2	44.9	40
Krasnodar krai	34.0	151.9	32.6	40	38.6
Astrakhan region	29.5	157.2	36.6	47.5	41.7
Volgograd region	32.4	129.3	23.8	51.1	47.3
Rostov region	26.1	93.36	13.9	38.4	39.4
NCFD	27.6	109.0	11.9	46.2	54.1
Republic of Dagestan	28.4	84.1	6.7	36.9	44.3
Republic of Ingushetia	2.42	162.1	18.0	61.4	42
Republic of Kabardino - Balkaria	17.1	102.8	3.30	34.3	39.9
Republic of Karachaevo - Cherkessia	11.5	132.4	20.0	33.5	36.9
Republic of Northern Osetia - Alania	26.5	142.0	37.8	40.6	62.1
Republic of Chechnya	13.4	126.3	5.47	56.2	31.2
Stavropolsk region	36.7	103.8	11.5	49.8	59.3

RTS: Regional transport systems, NCFD: North Caucasus Federal District, SFD: South of Russia

Evaluation of closeness of the connection between the activity indicators of different kinds of transport and the overall economic growth for the period 2000-2012 gave the following results: Correlation coefficients of volume indicators of rail and road transport sectors with agriculture industry sectors, retailers, as well as the gross regional product are in the range of 0.7-0.99.

A similar analysis was carried out in relation to passenger services and led to the conclusion that with the increasing incomes of the population the road transportation of general use is reduced. The study of transport mobility of the population would be actual, but the statistics on this type of transport in terms of regions is lacking.

It is obvious that the relationship between the results of the activity of the industry sectors of the national economy and transport is not always equally tracked. However, as in the case of the Federal District, in some regions of the coefficients of determination of the constructed models are below 0.7. This is typical for the regions, where the transport is not important or it is not so closely with the tested industries.

3.4. Forecasting of the RTS Trends

Forecasting of the RTS trends development and its external environment is based on quantitative and qualitative analysis of the RTS functioning indexes. This simulation was performed, depending on the availability and quality of the original information. This phase of the study is one of the points of application of the principle of adaptation of methodological tools to the information support. In the case, if retrospective period and the trend line allow us to construct the model, providing a high level of predictive accuracy further research is not required (Table 2). Otherwise, quality forecast is accompanied by the quantitative one, based on the expert opinion.

The results of the analysis in the context of the federal districts provide a sufficiently high level of reliability of the forecast. At

Table 2: Forecast models of truck freight transportation by federal district (million tons, 2000-2013, on materials of UISS)

District	Forecast model	Determination coefficient
FEFD	$y=4.4143x^2-29.186x+89.32$	0.71
SibFD	$y=16.748x^2-139.64x+732.5$	0.86
UFD	$y=1.8699x^2-45.773x+58.31$	0.91
VFD	$y=15.707x^2-165.91x+30.36$	0.95
NCFD	$y=1.3x^2-14.28x+114.8$	0.85
SFD	$y=8.4786x^2-63.261x+10.28$	0.96
NWFD	$y=3.9643x^2-33.056x+76.72$	0.76
CFD	$y=14.064x^2-87.256x+40.78$	0.79

x: Time, y: The volume of cargo transportation by road, FEFD: Far Eastern Federal District, SibFD: Siberian Federal District, UFD: Ural Federal District, VFD: Volga Federal District

the same time, similar construction of models in the context of the subjects of the Russian Federation is problematic because of the low determination coefficient due to the instability of the functioning of the number of the RTS.

4. DISCUSSION

The proposed method was tested on the statistical materials on the functioning of the RTS of Russia for 2000-2012. Dynamic changes, which have taken place in the economy over the last 2 years, consequences of the crisis, economic sanctions, reorientation of many industry sectors into the domestic market significantly affect the requirements for the transport infrastructure and the development of the transport industry sector as a whole. The available regional statistics data do not allow conducting full investigations of the RTS functioning timely (e.g. the publication of collections of regional statistics comes a year after the balance sheet date). Information, presented in various statistical bulletins is fragmented in most cases and does not provide a complete picture about regional differentiation of economic processes in the industry. The mentioned above defines a key problem for studies

using the developed technique. However, in our opinion using this technique it is possible to isolate the stable types of RTS, on the basis of which the formation of strategic alternatives of their activities is possible. Furthermore, to neutralize the lack of information at the regional and federal level during the research and strategy development in our opinion it is reasonable to form a system of monitoring, which will serve as the basis for real-time data services and statistical analyzes of rating agencies.

It is worth noting that non-strict definition of specific models in the study, but only setting of the key aspects and analysis trends allows realizing the adaptation principle on the stage of the strategy and monitoring period. In the first case - within a choice of methodological tools to develop the RTS spatial development strategy depending on available statistical data in predicting the major indicators of the RTS functioning in the SSES. In the second - an adaptation is manifested through the ability to change target and local tasks, depending on changes in the operational environment of the RTS.

5. CONCLUSION

The RTA researches carried out by the proposed instruments can serve as a basis for the formation of strategic decisions within planning at the federal and regional level, taking into consideration the peculiarities of the transport interaction of subjects. The results of the study, conducted on the basis of the proposed method can serve as a basis for long-term plans in the separate sub-sectors of transport in the regions and identify the strong and weak sides of RTS. A complex comparative evaluation suggests that the developed method can also be used for other regional industrial sectors provided for the development of an adequate system of indicators. Furthermore, comparative analysis of the proposed methodical scheme can be carried out in the context of transport sub-sectors in a certain area or federal district that serves as a basis for the development of regional development programs.

In our opinion, the proposed method fully covers the key aspects of the RTS and due to this fact can be widely used in application and theoretical research. Its modifications will permit similarly structured analysis of other industry sectors. Application under a monitoring system will provide the possibility of obtaining the whole dataset, which can be easily analyzed in the dynamics in the implementation of development strategies of the RTS.

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