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ECONOMICS AND TOURISM

ALLOCATION THEORIES, NEW ECONOMIC GEOGRAPHY AND AGGLOMERATIONS IN THE CITIES AND REGIONS OF RUSSIA

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ABSTRACT

The aim of the study is to supplement the theses of the allocation theories and new economic geography of results the analysis of the agglomerative processes dynamics in the cities and regions of Russia. To achieve this goal the analysis of the studies on this issue was conducted, we presented theoretical back-ground, the analysis of the dynamics of agglomerative processes in Russian cities and regions was also held, and we made the appropriate conclusions. The reported study was supported by RFBR, research project No 15-36-20012

Keywords: allocation theories, new economic geography, agglomerations in the cities and regions, Russian regions

INTRODUCTION

Today the allocation theories proved their unfoundedness: factors of "first nature" ceased to explain the development efficiency a lot of economic activities and their concentration in certain regions. The actual problem, to be solved by up-to-date global researches in the field of regional economy, is the creation of the universal theory, which would explain the processes of territorial concentration and dispersion of social and economic activities. A number of studies aims at improving the allocation theories: owing to it there was the appearance of such ultramodern trends in science, as new economic geography and new theories of international trade, prerequisites for their integration into a unified doctrine are made. Every year theoretical principles are completed and corrected, they are approved on the basis of regions around the world to demonstration their viability.

The aim of the study is to supplement the theses of the allocation theories and new economic geography of results the analysis of the agglomerative processes dynamics in the cities and regions of Russia. To achieve this goal the analysis of the studies on this issue was conducted, we presented theoretical back-ground, the analysis of the dynamics of agglomerative processes in Russian cities and regions was also held, and we made the appropriate conclusions.

The results of the analysis of agglomerative processes in the cities and regions of Russia are presented in research. Agglomerative processes analyzed in Russian cities with a population of over 100 thousand people on the criterion of population density changes subject to the migration growth and changes in the city's share in total industrial production in the region (author modification of the method Strange, 2009). The article presents the results of analyzing the concentration of economic activity in Russia in general, and in the Federal District in particular by defining Herfindahl-Hirschman index and Gini index (with the construction of Lorenz curve) in terms of industrial production, the volume of investments in fixed assets, the number of employees in the economy from 1990 to 2013, P. Krugman concentration index for 2002-2013 years.,

CR3 and CR4 index on the type of economic activity in the 2002-2013. The analysis helps to identify areas with agglomerative processes, to determine key factors and patterns of economic efficiency concentration, actualize the allocation theories and new economic geography for the possibility of a subsequent formation of recommendations to conducting the economic policy in the regions.

1. Theoretical background and bibliography. In the modern world scientific economic literature the provisions of location theories are updated in two trends: from a perspective of developments in the field of the new economic geography (explanation of the concentration of economic activity in separate regions) and provisions of new trade theory (explanation of positions of boundary regions under definite conditions of trade). There are the studies in which attempts to unite two independent theories are made: Location theory and international trade theory. Separate empiric studies on the base of the Russian regions showed availability of a definite specificity and even some contradictions with the location theories provisions. This can serve not only as a subject of additional study but the basis for review and supplement of separate provisions of the productive power location theories.

The current task to solution of which the modern world studies in the sphere of the regional economy are aimed consists in creation of a general theory which would explain phenomena (processes) of agglomeration and spread of population, human resources, other factors of production and wealth (welfare) (Ottaviano, Thisse, 2003). A variety of research works is aimed to improvement of the productive power location theories: due to this such ultramodern trends in science as the new economic geography, new (and contemporary) theories of international trade appear, the prerequisites of their integration into a single doctrine are created.

In 2008 for the attempt to integrate the location theory and international trade theory an American economist Paul Krugman was awarded the Nobel Prize. At that the study actuality in this sphere grows.

It is necessary to highlight the position and role of the national (in our situation soviet) science in development of this branch of knowledge. It is known that the classics of the productive power location theory are A. Weber, J. Thünen, A. Lösch, W. Christaller, D. North, A. Marshall, W. Isard and other foreign scientists. However this trend was also very successfully developed among the Russian scientists during 1960-70s. Among them are V.S. Nemchinov, A.Ye. Probst, N.N. Nekrasov, A.G. Granberg, Yu.A. Shatalin, I.G. Shilin, A.G. Aganbegyan, A.T. Khrushchev, N.T. Agafonov, P.Ya. Baklanov, M.K. Bandman, etc. Difficulty of interpretation of the results of their studies in the current context is that they were developed for the planned economy. But it shall be noted that a range of groundwork of the soviet authors anticipated foreign studies and separate conclusions are still relevant to this day. Baklanov P.Ya. (Baklanov, 2012) in his critical article closely considers the cross points of the modern western works in the sphere of productive power location theory with the groundworks of the soviet scientists. Thus we can state contribution of the Russian scientists to this area of economic knowledge. Furthermore, the formed productive power location concept in the world science also requires significant corrections and updating (Ottaviano, Thisse, 2003).

Nowadays in the Russian science the studies in terms of the productive power location theory are carried out by Pilyasov A.N., Kutsenko Ye.S., Rastvortseva S.N. (in the context of the new economic geography provisions), Preobrazhensky Yu.V. (in regard to

the long wave theory of N.D. Kondratiev), Litovsky V.V. (for use in the theory of flow), Morozova N.I., Balakina L.P., Kazakov A.A. (historical perspectives of theory development, review articles), Pirozhenko O.Yu., Konovalova T.A. (in the context of city economy), Andreevskikh P.A., Polyanin A.V., Petrova T.V., Baklanov P.Ya., etc.

M. Amiti proves that the industries tending to concentration have 1) high level of scale effects, 2) high share of transitional resources in final output, 3) concentration in the countries which have access to large markets. D. Davis in his works tests and supplements the Heckscher-Ohlin-Vanek model, estimates influence of trade liberalization on labor market (2011).

2. Agglomerations in the cities. Against the background of general urbanization it can be noted that more active development of separate cities leads to agglomerative effects and concentration of resources. The location theories emphasize various factors of concentration of human, financial, technological, material resources within one territory. At that several cycles of interaction are triggered.

1. From the standpoint of region export orientation, location of a variety of exporting companies in a city leads to necessity and possibility of service companies support. This increases diversity of services to be rendered and improves the efficiency of manufacturers and exporters activity (scale effect, joint use of infrastructure facilities, common labor market, common intermediary agents, etc.). Such positive environment amplifies attractiveness of a city for new exporters.

2. From the standpoint of citizens (consumers), location of a great number of specialized and service companies in a city leads to expansion of range of consumer goods (diversity), which contributes to saving, and consequently raises real income level of population. This forms positive urban environment for new citizens (consumers), drives up demand and creates prerequisites for new companies.

3. From the standpoint of implicit knowledge accumulation, economic growth in a city triggers demand for white-collar workers, facilitates their concentration, improves performance in innovation sector. This makes a city attractive for new companies and triggers agglomeration process.

Due to initial natural scarcity it can be assumed that economic resources are concentrated in some cities and they are insufficient in other cities. Such uneven social and economic development, on the one hand, forms the regions-locomotives of growth, cities-points of accelerated development, territories of advanced development, etc., but, on the other hand, intensifies interregional inequality and reflects adversely on national economy at large.

2.1. Research methodology – agglomerations in cities. To a present day there is no generally recognized assessment procedure of agglomeration processes in the regional economy. One of the simplest approaches is the method of Strange W.C [**Error! Reference source not found.**], which was applied by him at consideration of occurrence of agglomeration processes in Canada. He used density of population of cities, namely its dynamic change. If density of definite cities increases at more rapid rates than in other cities, then one can speak about occurrence of an agglomeration process. This method has a range of disadvantages, from our point of view. Spatial area of a city changes hardly ever, and expansion of the territory can be indicative of an agglomeration process. The growth of the population density in the city can take place due to high birth

rate (for example, in some Islamic regions of Russia) and be outside the framework of the agglomeration process. Therefore to our opinion, the indicator of the growth of the city population shall be supplemented by consideration of migration gain.

Let us consider display of agglomeration process in the Russian cities using the population density indicator. The subject of the study in this case will be cities with population over 100 thous. Such selection is determined by availability of the statistical data across Russia. The study period is 2004-2014, the information source is the annual statistics digest "The Regions of Russia: Basic Social and Economic Indicators of Cities".

2.2. Results of the analysis of agglomeration processes in the cities. If in 2010 in Russia there were 169 cities with population over 100 thous., in 2014 such cities numbered 178. At that it shall be noted that not only occurring of new cities in the group, but also some cities leaving the group due to decrease of population. In 2010 such cities numbered 70 367.9, in 2014 – 101 442. Stable growth of the population for the last four years has been observed in 107 cities.

At this stage we cannot judge on the agglomeration process development in these cities because the growth of the population can be explained by high birth level. For example, the population of eight cities increases against the background of migration outflow: Makhachkala, Derbent, Khasavyurt (the Republic of Dagestan), Grozny (the Chechen Republic), Neftekamsk (the Republic of Bashkortostan), Naberezhnye Chelny, Nizhnekamsk (the Republic of Tatarstan) and Biysk (the Altai Territory). Thus, if for statement of the agglomeration process not only stable growth of the population but also the migration gain is required, then we can note it in 90 cities of Russia.

Most cities where agglomeration processes are observed are located in the Central Federal District – 29 (including Moscow). In 2014 their population numbered over 20 mln. Sixteen actively growing cities with total population over 10.5 mln. are located in the Volga Federal District, 14 – in the Northwestern Federal District (about 9 mln.), 11 – in the Siberian Federal District (about 7.2 mln.). By six rapidly growing cities are located in the Southern Federal District (about 1 mln.), Ural Federal District (about 4.2 mln.) and Far Eastern Federal District (about 3.9 mln.). Four cities, in the North Caucasian Federal District numbered about 2 mln. of the population. The cities where the agglomeration process is observed with growth of the population by more than 10 % are given below (from 2004) (Fig. 1).

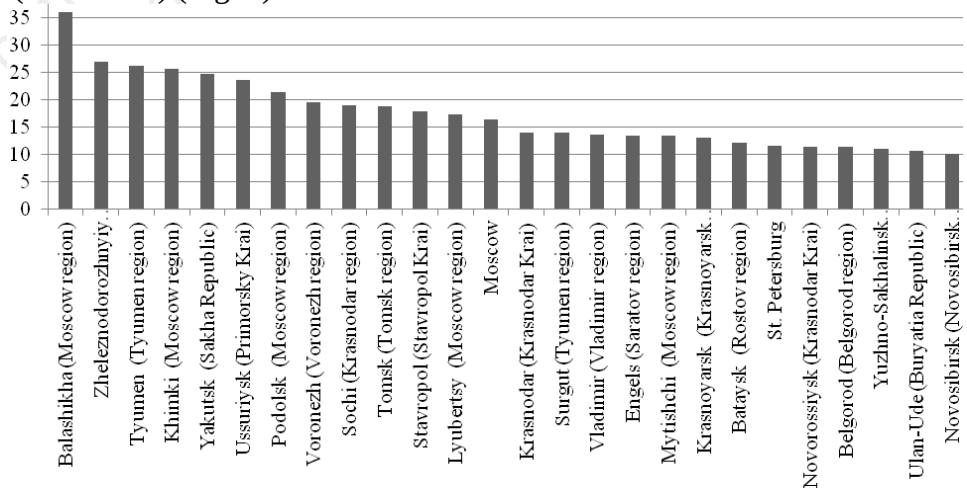

Fig 1. The rate of the growth of some cities of Russia for 2004-2014, %

The most rapid rates are observed in Balashikha, the Moscow Region. Its population has been increased by third for 10 years. This can be explained by close proximity to Moscow. In the Moscow Region the heightened rates of development are observed in Zheleznodorozhny, Khimki, Podolsk, Lyubertsy, Mytishchi. The population grows rapidly in the cities of the extractive industry – Tumen, Yakutsk, Surgut, Yuzhno-Sakhalinsk, large industrial centers – Saratov, Engels, Krasnoyarsk, Voronezh, etc.

Thus, we see that the agglomeration processes mainly take place in cities. Let us consider the concentration process of economic activity in the regions at large.

3. Agglomerations in regions. Under the conditions of fast-changing foreign trade business environment and political priorities the positive and adverse effects are unevenly distributed in the economy of the Russian regions [4]. The agricultural areas note high economic growth rates, determined by the imports phase-out policy and imposed retaliatory sanctions, export regions which have been successful before, vice versa, experience the problems during reorientation of the foreign trade activity. Those sectors which actively use innovative technologies most of all suffered the Russian confrontation with the West. We have noted earlier that the manifestations of crisis flatten out the interregional segregation by social and economic indicators, the degree of concentration of manufacturing and investments is decreased. It would be interesting to assess how the foreign policy of Russia has influenced on location of economic activity in the regions. However due to absence of the statistical data for 2014 we can analyze only the state of the Russian economy in which it reached to the period of the changes.

3.1. Research methodology – agglomerations in regions. For calculation of the Herfindahl–Hirschman Index (HHI) let us determine the factory output, volume of capital investments and the number of the employed in the economy as initial indicators using which the concentration will assessed:

$$HHI = \sum_{i=1}^{n} x_i^2, \quad (1)$$

where - share of region *i* in the total indicator.

One more indicator reflecting the degree of the economic activity concentration in the region is the Gini Index (*G*):

$$G = 1 - 2\sum_{i=1}^{k} dx_i dy_i^n + \sum_{i=1}^{k} dx_i dy_i, \quad (2)$$

where dx_i - share of group *i* in the total indicator; dy_i - share of group *i* in the total feature size; dy_i^n - accumulated share of group *i* in the total feature size.

The Gini Index can vary from 0 to 1. The Krugman Concentration Index assesses the concentration by separate types of manufacturing industry [3]. The concentration in separate sectors can be discussed when a significant part of products is manufactured in small number of the regions. The higher value of the index the higher the level of concentration of this industrial sector.

The concentration indices CR_3 and CR_4 show which share of the employed in the industrial sector is concentrated in three or four largest regions as per this indicator [2]:

$$CR_{3i} = \sum_{j=1}^{3} s_{ij}, \quad (3) \qquad CR_{3i} = \sum_{j=1}^{4} s_{ij}, \quad (4)$$

i – the industrial sector; j – region (one of three or four) with the highest share of employed in the sector i; s_{ij} – the share of employed in the region j in the total number of employed in the sector i.

3.2. Results of the analysis of agglomeration processes in regions. The dynamics of the Herfindahl-Hirschman Index calculated by the industrial output, capital investments and number of the employed in the economy across the Russian regions in 1990-2013 is given in the Figure 2.

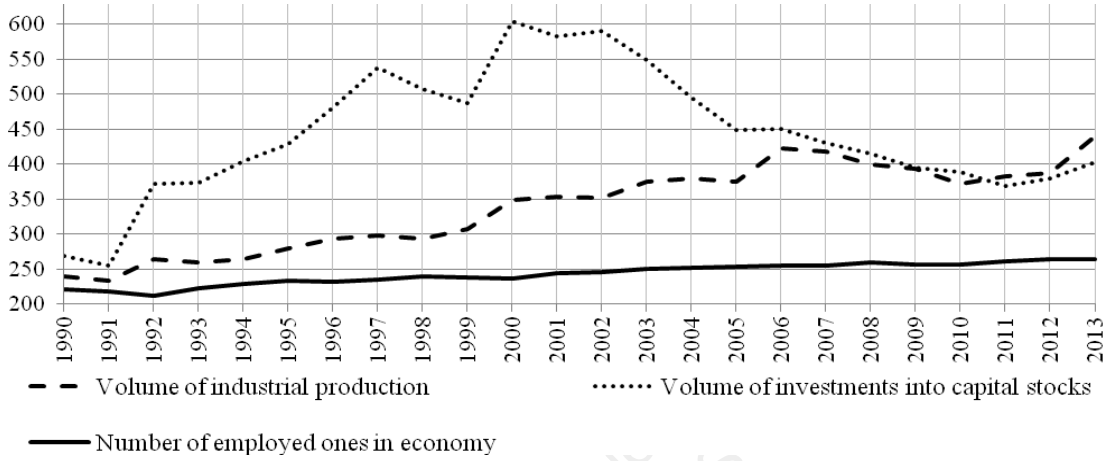

Fig.2. Dynamics of Herfindahl-Hirschman index calculated by volume of industrial production, amount of capital stock investments and number of employed ones in economy in 1990-2013

As shown in Figure, the concentration of industrial production by output volume and number of employed ones in the economy is stably increasing, while the investments into the capital stock were more diversified up to 2010.

Let us consider the dynamics of the Herfindahl-Hirschman Index in detail by the federal districts (Figure 2.5). The degree of the economic activity concentration in the Russian regions in 2005 was 374.85, in 2010 – 383.49, in 2013 – 439.91 by the indicator of the industrial output.

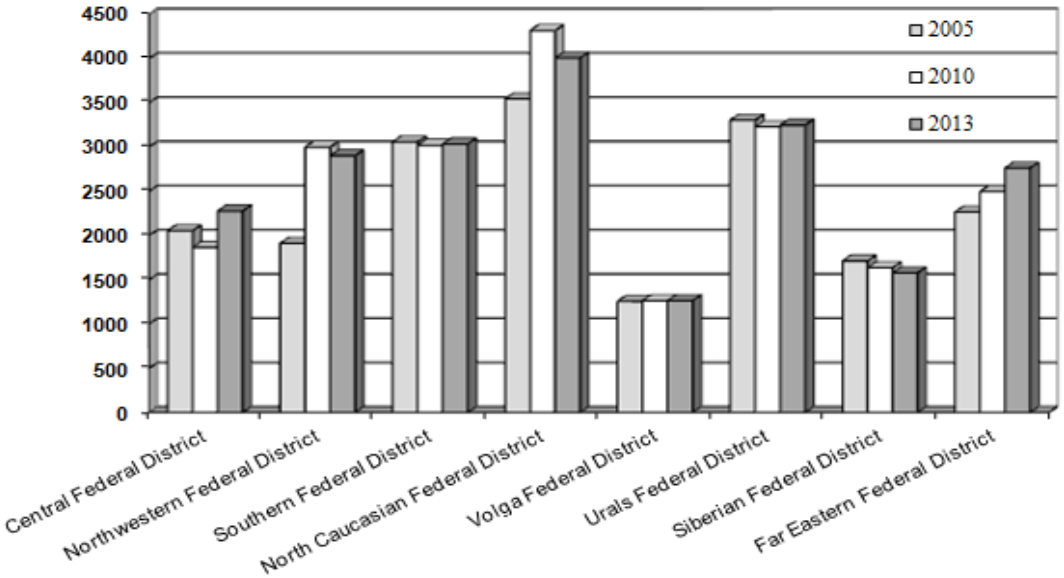

Fig. 3. The dynamics of the manufacturing industry concentration (Herfindahl-Hirschman Index) by the Russian Federal Districts in 2005, 2010, 2013, index

The maximum value of the Herfindahl-Hirschman Index is 10000. The minimum value depends on the number of the regions in each district. Thus, for the Central Federal District it is 1865.43; Northwestern Federal District – 1911.52; for the Southern Federal District – 3019.84; for the North Caucasian Federal District – 3544.52; for the Volga Federal District – 1256.89; for the Ural Federal District – 3228.82; for the Siberian Federal District – 1578.41; for the Far Eastern Federal District – 2265.68.

The post-event analysis of the degree of the manufacturing industry concentration in the Russian regions as per the Herfindahl-Hirschman Index showed the tendency both of increase and decrease in the country districts. It shall be noted that the uptrend has been observed in many regions from 2005 to 2010 and downtrend – from 2010 to 2013.

In the Central Federal District there was increase of the degree of the concentration by 10.8% mainly due to Moscow (the share of the region manufacturing industry in the federal district in 2005-2010 was in average 38.97 %), Moscow region (19.85%), Kaluga (4,09%) and Belgorod (4.66 %) Regions. In the Northwestern Federal District the most dynamic concentration of manufacturing industry is observed which is increased by 51.9 % due to Saint Petersburg (44.88 %) and the Kaliningrad (7.41 %) region. In the Southern Federal District the degree of the manufacturing industry concentration is decreased by 0.83 %. The Dynamic concentration of the economic activity is also observed in the North Caucasian Federal District – by 13.04 % due to the Stavropol Territory (59.43 %). In the Volga Federal District the increase of the Herfindahl-Hirschman Index is 0.26 % due to the Nizhni Novgorod Region (16.27 %), the Republic of Tatarstan (15.68 %), the Perm Territory (13.46 %). In the Ural Federal District the degree of the manufacturing industry concentration is decreased insignificantly – by 1.6 %. In the Siberian Federal District the indicator is decreased by 7.8 %. In the Far Eastern Federal District the increase of the economic activity concentration indicator for the analyzed period by 21.98 % is ensured due to the Kamchatka (9.2 %) and Primorye Territory (35.14 %).

The Herfindahl-Hirschman Index calculated (Fig. 4) at large across the Russian Federation in 2005 was 444.23, in 2010 – 373.47, in 2013 – 402.85 by the indicator of capital investments volume. We can see that the dynamics of the investments concentration degree in the Russian regions is controversial.

The highest concentration of capital investments is observed in the Central Federal District during the whole analyzed period. This occurs due to the Moscow Region and Moscow in particular: the share of Moscow in total volume 42.95%. The high Herfindahl-Hirschman Index is observed in the Volga (due to the Republic of Tatarstan – 23.35% in 2013) and Ural (due to the Tyumen Region – 71.75% in 2013) Federal Districts.

The growth of the capital investments concentration in the Russian regions is observed in the Northwestern Federal District, North Caucasian Federal District and Far Eastern Federal District. During the period of 2012-2013 39 regions of the Russian Federation have increased their shares in total volume of capital investments and 41 – have decreased.

The Krugman index provides evaluation of concentration by certain types of the processing industry. Concentration in certain sectors can be discussed, when the significant part of production is realized in a small number of regions. The higher is the index, the higher is the level of concentration in the given sector of industry [1].

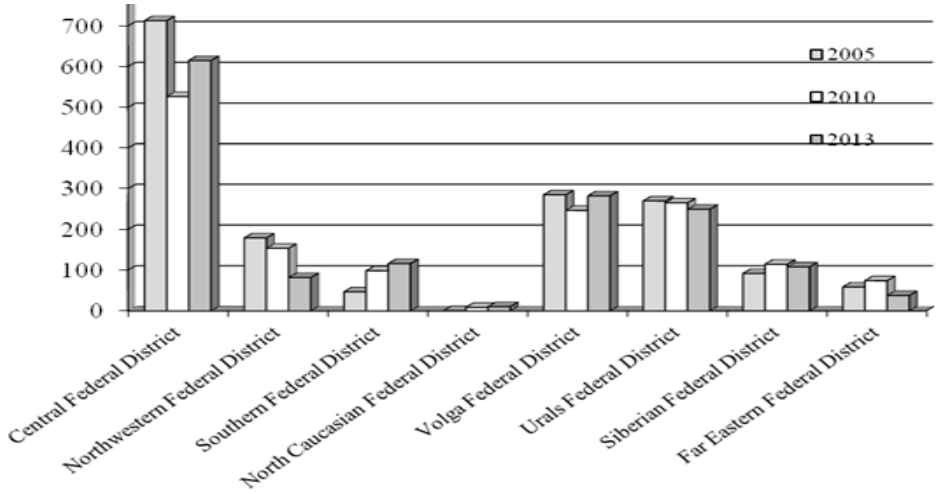

Fig. 4. The dynamics of concentration of capital investments (Herfindahl-Hirschman Index) by the federal districts of Russia in 2005, 2010, 2013, index

The lowest degree of concentration is in the food industry, as well as in production of nonmetallic mineral products. The high concentration is in the production of leather, leather products and footwear, in the wood processing industry and in production of the wooden articles. The significant reduction of concentration degree for the analyzed period is observed in the cellulose and paper production, publishing and printing activity, production of rubber and plastic articles, metallurgical production and production of the finished metal articles.

CR_3 and CR_4 indexes show, which share of workers in the production sector is concentrated in three or four largest regions of this indicator. The share of three largest regions by production volume in any of subsectors of industry does not exceed 35%. It is logical to suppose, that in those subsectors, where the production concentration is high, CR_3 index will also be high. I am not going to separately provide the dynamics of CR_4 index, I only indicate, that it slightly exceeds CR_3: averagely by 4.6 points (from 3.54 points in food industry to 6.2 points in chemical production).

CONCLUSION

In the paper we presented theoretical back-ground and analysed of the dynamics of agglomerative processes in Russian cities and regions. It helps to identify areas with agglomerative processes, to determine key factors and patterns of economic efficiency concentration, actualize the allocation theories and new economic geography for the possibility of a subsequent formation of recommendations to conducting the economic policy in the regions.

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