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INTERREGIONAL INEQUALITY IN RUSSIA: EMPIRICAL ANALYSIS

The author carries out a spatial and dynamic analysis of interregional inequalities in Russia during the period 1994–2012, measured by the Theil Index. Structural peculiarities and change trends in interregional disproportions in Russian regional space are identified.
Keywords: interregional inequality; interregional differentiation; region; Theil index, Russia.

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МІЖРЕГІОНАЛЬНА НЕРІВНІСТЬ В РОСІЇ: ЕМПІРИЧНИЙ АНАЛІЗ

У статті проведено просторово-динамічний аналіз міжрегіональної нерівності в Росії за 1994–2012 рр. на основі індексу Тейла. Виявлено структурні особливості та тенденції зміни міжрегіональних диспропорцій у російському регіональному просторі.
Ключові слова: міжрегіональне нерівність; міжрегіональна диференціація; регіон; індекс Тейла; Росія.
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МЕЖРЕГИОНАЛЬНОЕ НЕРАВЕНСТВО В РОССИИ: ЭМПИРИЧЕСКИЙ АНАЛИЗ

В статье проведен пространственно-динамический анализ межрегионального неравенства в России за 1994–2012 гг. на основе индекса Тейла. Выявлены структурные особенности и тенденции изменения межрегиональных диспропорций в российском региональном пространстве.
Ключевые слова: межрегиональное неравенство; межрегиональная дифференциация; регион; индекс Тейла; Россия.

Introduction. Interregional inequalities at the subnational level can be observed in many countries of the world. Developed countries usually have lower level of interregional inequality, unlike developing countries, where interregional inequality level is higher.

A certain level of differentiation may either speed up or restrain economic development. On the one hand, certain level of inequality is considered to be a necessary prerequisite for investment and economic growth (Barro, 2000; Forbes, 2000). On the other, according experts of the International Monetary Fund и The World Bank, high level of inequality may represent an obstacle for sustainable long-term economic development and destabilize the situation in many regions, also increasing social and political tensions (Bastagli, Coady and Gupta, 2012; Berg, 2011; The World Bank, 2006). This contradiction gave rise to numerous research attempts in this direction.

Recent research and publications analysis. Contemporary theories of cumulative growth and new economic geography define interregional differentiation as the expected result of the regions economic development. Among the theories of cumulative growth it is worth mentioning the concept of "circular cumulative causation" developed by G. Myrdal (1972), "poles of growth" by J.R. Boudeville (1966), F. Perroux (1961), the theory of urban agglomerations by H. Richardson (1973), the

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"center − periphery" theory by J. Friedman (1966), the "diffusion of innovation" model by T. Hagerstrand (1968). The main assumption of the cumulative growth theory is that economic development of various areas is uneven. In compliance with the guidelines of the new economic geography of P. Krugman (1998) the development of spatial socioeconomic systems is defined by such factors as geographical location, natural resources availability, agglomerative effect, human capital, well-developed transport infrastructure and institutional environment.

Empirical research has proved that the process of economic differentiation of regions is adherent to all countries. However, there is no unanimous opinion on the direction of differentiation processes. J.G. Williamson (1965) suggested using an inverted U-curve to describe interregional inequalities. As it is estimated by the International Monetary Fund (Bastagli et al., 2012) and The World Bank experts (The World Bank, 2006), inequalities are characterized by the growing tendency in most regions of the world. The research group "University of Texas Inequality Project" (UTIP) supervised by J.K. Galbraith (2009; 2011) came to the conclusion that inequalities depend on the level of economic development and change according to the inverted S-curve. Therefore, different countries show different trends of interregional inequality.

In Russian Federation the research in this field started in the 1990s. In Russia the issues of spatial development and effective regional policy aimed at smoothing interregional differentiation are being extensively discussed by A.G. Granberg et al. (2004; 2007), M.V. Melnichuk (2010), R.M. Melnikov (2006), A.S. Tatarkin et al. (2010), T.V. Yalyalieva (2011). The issues of interregional inequality are being developed by A.Y. Shevyakov and A.Y. Kiruta (2009), O.I. Shkaratan (2009), N.V. Zubarevich (2010) and other Russian researchers.

The purpose of this paper is to carry out spatial and dynamic analyses of interregional inequality in Russia for the period 1994−2012. The research includes the analysis of dynamics, trends and structure of interregional inequalities.

Methodology and data. In Russia interregional inequality between at the subnational level is usually estimated by inequalities on the level of regional development of Russian Federation subjects. In this respect, the gross regional product (GRP) is the generalized indicator of economic development at the regional level and gross domestic product (GDP) − at the national level. Measurement of regional disparities will be performed using the Theil index (Theil, 1967):

$$I_T = \sum_{i=1}^{N} \frac{y_i}{y} \ln\left(\frac{y_i/p_i}{y/p} \right),$$

(1)

where I_T is the Theil index; N is the number of regions; y is GDP; y_i is GRP of the i-th region; p is the total population of the country; p_i is the population of the i-th region.

The research is grounded on the statistical data provided by the Federal State Statistics Service of Russian Federation (Rosstat) for the period 1994−2012 and also on the World Bank data. The research includes 80 subjects of the Russian Federation

(before 2005 no data was obtained on Chechen Republic) and 8 Federal districts.

Key research findings. In Russia the gap between the minimum and the maximum GRP per capita was in 1994 − 14 times, in 2005 − 38 times, in 2012 − 16.8 times. To in compare, developed European countries this value doesn't exceed 6 times. Therefore, regional disproportions in Russia can be evaluated as extremely high.

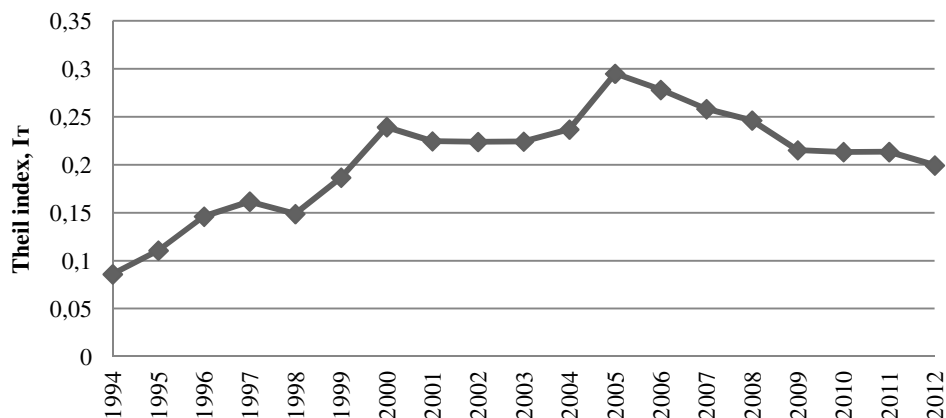Figure 1 shows the dynamics of interregional inequality using the Theil index.

Figure 1. **Dynamics of interregional inequality in Russia,**
compiled and calculated by the author

Divergence processes observed in the period between 1994 and 2000 with the slight drop in the inequality level in 1998 (the year of economic crisis) and between 2002−2005. Convergence processes occur between 2000 and 2002 and between 2005 and 2012. The maximum value of regional inequality falls in 2005 which is quite understandable. Before 2005 there was no data collected on the Chechen Republic. Beginning from 2005 Rosstat included the data on Chechen Republic, one of the poorest and the most densely populated regions with very low GRP per capita which predetermines the abrupt change in the inequality values. We can assume that should we have complete the statistical data on Chechen Republic within the whole period under study, we would have had slightly higher inequality values between 1994 and 2004 too. The author's calculations can be supplemented with the research results obtained by J.K. Galbraith, L. Krytynskaia and Q. Wang (2003) who also calculated interregional inequality using the Theil index. According to the results of their studies in the period between 1990 and 2000 interregional disproportions increased.

In The World Bank report for 2009 it can be seen that the slow process of decrease of spatial inequality between subnational areas in the countries launches as soon as the GDP per capita reaches 10,000 USD (The World Bank, 2009: 85). In Russia reductions in the level of inequality began when GDP per capita (as purchasing power parity) approached 12,500 USD.

There are 8 federal districts in Russia, i.e. Central, North-West, Volga, Ural, Far East, Siberian, North Caucasus and South Federal Districts. Each federal district

represents a macroregion which includes a number of adjacent regions. Using the Theil index the overall interregional inequality is decomposed into the following components (Bourguignon, 1979): inequality between the Federal districts and inequality within them. This allows identifying the structure of inequality:

$$I_T = T_B + T_W = \left[\sum_{k=1}^{K} \frac{y_k}{y} \ln\left(\frac{y_k/p_k}{y/p} \right) \right] + \left[\sum_{k=1}^{K} \left(\frac{y_{kj}}{y_k} \right) T_k \right]; \qquad (2)$$

$$T_k = \sum_{j=1}^{L_k} \frac{y_{kj}}{y_k} \ln\left(\frac{y_{kj}/p_{kj}}{y_k/p_k} \right), \qquad (3)$$

where I_T is the Theil index; T_B is the index of intergroup inequality (between the federal districts); T_w is the weighted average of intragroup inequality index (within the federal districts); K is the number of federal districts; y is GDP; y_k is gross product of k-th federal district; y_{kj} is GRP of j-th region included into the k-th federal district; p is the total population of the country; p_k is the population of the k-th federal district; p_{kj} is the population of the j-th region included into the k-th federal district; T_k is the intragroup Theil index for k-th federal district (within the k-th federal district); L_k is the number of regions in k-th federal district.

Inequality within federal districts is on average 2.2 times higher than the similar value between the federal districts (Figure 2). The share of inequality within federal districts is increasing from 69% to 75% in the period between 1994 and 2000 and then a decrease up to 68% occurred in 2012.
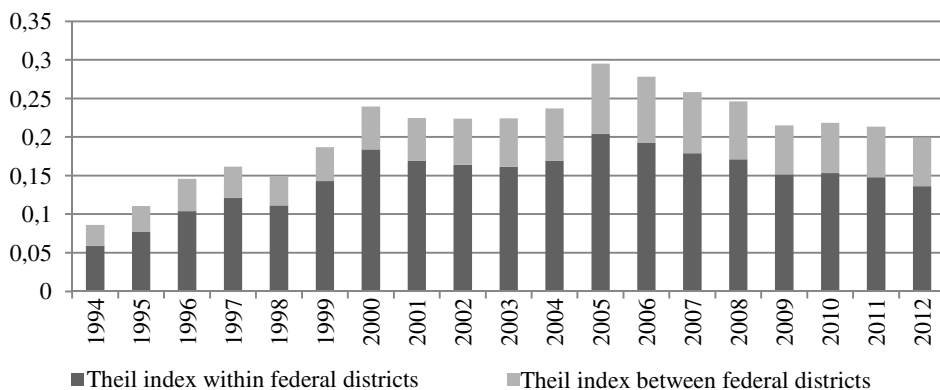

Figure 2. **Dynamics of inequality between and within federal districts of Russia,** *compiled and calculated by the author*

Russian regional space is severely polarized. The distribution of GRP per capita is skewed to the right, since the impact of a few regions with the high value of GRP

per capita in relation to other regions is rather strong. Should we exclude 4 better developed regions (Moscow, Tyumen and Sakhalin Regions, Chukotka Autonomous Area), the value of the overall inequality is 2—3 times lower and demonstrates relatively stable level of interregional disparity. Over a half of interregional inequality is formed due to these 4 richest regions: there is a continuous increase tendency in the share of these regions. Their contribution to the overall inequality increased from 55% up to 69% by 2012 reaching the maximum value of 75% in 2006. The major factors causing polarization are agglomeration economies in the Moscow case and the availability of oil and gas resources for other 3 regions. Super profits of the regions in the first half of the 2000s obtained as a result of hydrocarbons trade have accelerated the economic growth of better developed regions making Russian economic space even more heterogeneous.

Conclusion. Russia repeats the global trend: sustainable economic growth of the countries is achieved due to the significant contribution of a few better developed regions and accompanied by increased inter-regional disparities. The effect of spatial polarization arises due to the high growth rate in 4 Russian regions: Moscow, Tyumen Region, Sakhalin Region and Chukotka Autonomous Area. Inequality calculated excluding these 4 richest regions is significantly lower and characterized by low stable level.

Inequality between the territory units is formed mainly within Russian Federal Regions (macroregions). Decomposition of interregional inequality into components showed that the inequality within federal districts (macroregions) exceeds the disparities between districts.

Against rapid economic development of Russia in the 2000s there was a rapid growth in interregional inequality. This sort of situation was typical for the country until 2005 when regional divergence changed into slow convergence. The convergence process of Russian regions can be explained, on the one hand, by active state regional policy, on the other — by a slowdown in economic growth rates.

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