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Procedia Economics and Finance 16 (2014) 56 – 63

Procedia
Economics and Finance

www.elsevier.com/locate/procedia

21st International Economic Conference 2014, IECS 2014, 16-17 May 2014, Sibiu, Romania

Differentiation of Population Incomes in Innovative Regions of Russia

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Abstract

The differentiation of population incomes in Russian regions clustered based on the Russian regional innovation index is estimated in the paper. To estimate the existing inequality the Gini coefficients calculated in terms of population money incomes with regard to the purchasing power of the ruble in the regions are used. Some conclusions about changes in the differentiation of population incomes taking into account the innovation factor are made and some recommendations concerning the state policy are formulated.

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Selection and/or peer-review under responsibility of Scientific Committee of IECS 2014

Keywords: population incomes; purchasing power of the ruble; Russian regional innovation index; Gini coefficient; cluster; Russia; state policy.

1. Introduction

Uneven economic, social, scientific, technological and innovative development of regions remains an urgent problem for many countries and international associations at the present stage of social development including the Russian Federation (RF). In 2011, the strategy of the innovative development of the Russian Federation up to 2020 was adopted in Russia. In this context the role of human capital and qualified human resources is increasing. One of the conditions for their forming is population incomes providing opportunities for training, improving qualification and using external knowledge sources. However, the interregional differentiation of population incomes in Russia is great. According to the Russian Federation Statistics Service (Rosstat) data the Gini coefficient increased from 0.395 in 2000 to 0.42 in 2012 while the R/P 10% ratio (the fund coefficient) rose from 13.9 to 16.4. But the Rosstat data on differentiation does not take into account the regional difference which includes different purchasing powers of the ruble in Russian regions. The calculation of population money incomes with regard to the purchasing power parity of

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the ruble (PPPR) makes it possible firstly, to compare population incomes in terms of time and space, secondly, it corresponds to the world practice of co-measuring population incomes in different countries based on the purchasing power parity of national currencies and thirdly, it makes it possible to use such tools as the Lorenz curve and the Gini coefficient in the analysis of the interregional inequality of the population. The Russian government does not take measures to reduce the population income differentiation. The question arises: How does the income inequality differ in various regions of Russia that are at different levels of innovative development? Thus, the objective of the research was to assess the differentiation of population money incomes based on the method developed by the authors which takes into account the purchasing power parity of the ruble in Russian regions (Litvintseva, G.P., Voronkova, O.V., Stukalenko, E.A. 2007) as well as the analysis of the income inequality in Russian regions that differ in the degree of innovative activity, scientific and engineering potential and the quality of the state regional policy

2. Literature review

Problems of development unevenness, differentiation, globalization and other processes are in the focus of attention of scientists from different countries including Russia. Interesting results have been obtained based on the results of studying the inequality of economic and social development in various countries of the world (Combes, P.-P., Mayer, T., Thisse, J.-F. 2008, Horvath, D. 2009, Poverty and Development into the 21st Century, 2000). Problems of interregional inequality are actively discussed by Russian scientists.

Some conclusions in the context of convergence-divergence of the Russian regions have been made in papers published by Mikheeva, N. (1999), Lavrovsky, B.I., Goryushkina, E.A., Shil'tsyn, E.A. (2010) and others. The econometric analysis along with the economic and mathematical analysis are used in papers published by Demidova, O.A., Marelli, E., Signorelli, M. (2013), Kolomak, E. (2013 a,b) to estimate differences between western and eastern regions of Russia. Kolomak E. has come to a conclusion that a spatial concentration of economic activity is continuing and interregional differences will be increasing in Russia in the nearest future. Problems of inequality, risks and unevenness of development as well as the role of the regional and social policy in solving these problems are discussed in papers published by Zubarevich, N.V. (2010), Chereshev, V.A., Tatarin, A.I. (2010), Litvintseva, G.P., Stukalenko, E.A., Voronkova, O.V. (2012) and others.

Interregional differences in prices and price distortions affecting the standard of living in Russian regions are studied in papers published by Gluschenko, K. (2004), Litvintseva, G.P., Stukalenko, E.A., Voronkova, O.V. (2010).

Various authors see the causes of interregional difference in initial conditions, the entrepreneurial climate as well as in economic and political reforms. Currently regional economists consider that uneven territorial development results from technological progress and market functioning.

This determines the goal of the present research. Firstly, the authors are concerned with the inequality of population incomes and not with the production component of the regional development. Secondly, they analyze the effect of innovative development factors on the population income differentiation in Russian regions.

3. Basic definitions and characteristics of statistical data

Official Rosstat data are used in the research. The following variables are analyzed: money incomes of the population in quintile groups, average per capita incomes and the number of the population in Russian regions. The number of regions is 80 federal subjects and 3 autonomous territories. Calculations were made for all RF regions and for five 20% groups of the population in every of the regions for 2000–2012. Aggregated data was calculated for all eight Russian Federation territories.

The following basic concepts are used in the research.

Money incomes of the population include incomes of entrepreneurs, wages paid to employees, social payments, property incomes such as interests on deposits, securities, dividends and other incomes such as hidden incomes, incomes of foreign currency operations, money transfers as well as occasional incomes.

The purchasing power parity of the ruble in the region is calculated as the ratio of the Russian average cost of the fixed consumer goods basket to the cost of this basket in the given region (in average annual prices).

To estimate the innovative development of RF regions the Russian regional innovation index (RRII) was used. It consists of 4 sub-indices reflecting socio-economic conditions of innovative activities, scientific and technical

potential, innovation activity and the quality of the innovation policy. They in turn integrate 36 various initial indices (Rating in innovative development of Russian Federation subjects, 2012). All regions are divided into 4 groups in terms of the RRII value based on the single-factor cluster analysis. The RRII value of the leading region (Moscow) and the last in the rating region (the Republic of Kalmykia) differ by 3.51 times in 2010 and by 4.28 times in 2008. The authors of the index note that the rating of the innovative development of regions has shown great instability of their positions.

The analysis is based on the data of 2008 and 2010, which is caused by the availability of the Russian regional innovation index for these years.

4. Research methods

The research was done in several stages. At the first stage average per capita monthly money incomes for every quintile population group in average Russian prices in the base year were calculated for every RF subject and for every year under study. The base year in this method is the last year of the period under study. To do this, money incomes were first adjusted to the prices of the base year by using regional deflator indices and then they were multiplied by the purchasing power parity of the ruble for the given region. The cost of the fixed consumer goods basket has been calculated by Rosstat since the end of 2000 and is specially designed for the interregional comparison of the population purchasing power in the Russian Federation. In 2008, the PPPR levels in the RF regions varied from 0.598 in the Kamchatka region to 1.254 in the Republic of North Ossetia. Conceptually it means that the purchasing power of the average Russian ruble was 59.8 kopecks in Kamchatka, 1 ruble 25.4 kopecks in the Republic of North Ossetia.

Further, the population groups under study (83 x 5) were ranged in the order of increasing average per capita incomes and then Gini coefficients as well as other indices needed for the analysis of the RF regions were calculated.

At the second stage of the research the inequality of money incomes in RF regions which are at different levels of innovative development was estimated. As mentioned above 4 clusters of regions ranged in the order of RRII decreasing in 2008 and 2010 were studied.

To infer the relationship between differentiation of population incomes and level of innovative development of Russian regions used empirical analysis.

5. Analysis of calculation results

The analysis of money incomes of the population with regard to PPPR has shown that the closest PPPR to the all-Russian level was observed in 2008 in the Novosibirsk region (1.005) the republic of Karelia (1.007) and in the Leningrad region (0.999) and in 2010 in the Stavropol territory (1.003), the Sverdlovsk region (1.004), the Novosibirsk region (1.005), the Krasnodar territory (0.999), the Voronezh region (0.997) and in the Tomsk region (0.996).

The average per capita incomes of the population calculated with regard to PPPR in the regions belonging to the same cluster of innovative development greatly differ from each other. For example, in 2008, in the regions belonging to cluster 1 average per capita incomes of the population varied from 10356.1 rubles (the Chuvash republic) to 24145.1 rubles (Moscow city). Table 1 shows the boundaries of the regional innovation index (RRII) for four clusters and Figure 1 gives average per capita incomes of the population with regard to PPPR linked to this index in 2008 and 2010. The analysis of money incomes of the population with regard to PPPR has shown that the closest PPPR to the all-Russian level was observed in 2008 in the Novosibirsk region (1.005) the republic of Karelia (1.007) and in the Leningrad region (0.999) and in 2010 in the Stavropol territory (1.003), the Sverdlovsk region (1.004), the Novosibirsk region (1.005), the Krasnodar territory (0.999), the Voronezh region (0.997) and in the Tomsk region (0.996).

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Table 1. Boundaries of RRII values for four clusters in 2008 and in 2010

Cluster	1	2	3	4
RRII value in 2008	0,543–0,412	0,391–0,330	0,325–0,263	0,258–0,127
RRII value in 2010	0,569–0,439	0,433–0,359	0,358–0,299	0,289–0,162



Figure 1. Average per capita monetary incomes of the population with regard to PPPR in the Russian regions with different RRII in 2008 and 2010

The correlation coefficient of average per capita incomes of the population with RRII in 2008 was 0.293 and in 2010 it was 0.323, which shows that there is no dependence between these indicators. Gini coefficients (G_n) calculated based on the population monetary incomes with regard to PPPR have great dispersion within an innovation cluster, which is seen in Table 2, while the indicators characterizing Gini dispersion are given in Table 3.

Table 2. Gini coefficients for four innovation clusters

Gini coefficient		1	2	3	4
Gn in 2008		0,4924–0,3376	0,4060–0,3288	0,4308–0,3312	0,4344–0,3312
Gn in 2010		0,4656–0,3420	0,3972–0,3384	0,4148–0,3324	0,4132–0,3348

Table 3. Statistical characteristics of the Gini coefficient for four innovation clusters

Characteristic		1	2	3	4
		2008			
Dispersion		0,0013	0,0004	0,0006	0,0005
Variation coefficient		0,0923	0,0574	0,0647	0,0618
		2010			
Dispersion		0,0009	0,0003	0,0005	0,0004
Variation coefficient		0,0777	0,0467	0,0608	0,0539

Thus, calculations show that income differentiation within an innovation cluster differs. No evident correlation between the Gini coefficient values and the RRII values was revealed either in 2008 (the correlation coefficient was 0.459) or in 2010 (the correlation coefficient was 0.416).

However, based on the mean indicators, whose analysis is of course not quite correct, direct dependence of a mean average per capita income value and an average Gini coefficient on the innovation cluster rank was revealed in 2008 and 2010 (Figure 2). That is, the lower level of innovative development a cluster has (transition from rank 1 to rank 2, 3, 4), the lower mean average per capita income value in this cluster are and vice versa.

It is necessary to note that in 2010 18 regions changed their innovation cluster due to increasing (13 regions) or decreasing (5 regions) their regional innovation index value as compared to 2008. The results of changing the level of average per capita population incomes caused by such transitions in prices of 2010 with regard to PPPR and the Gini coefficient are shown in Table 4.

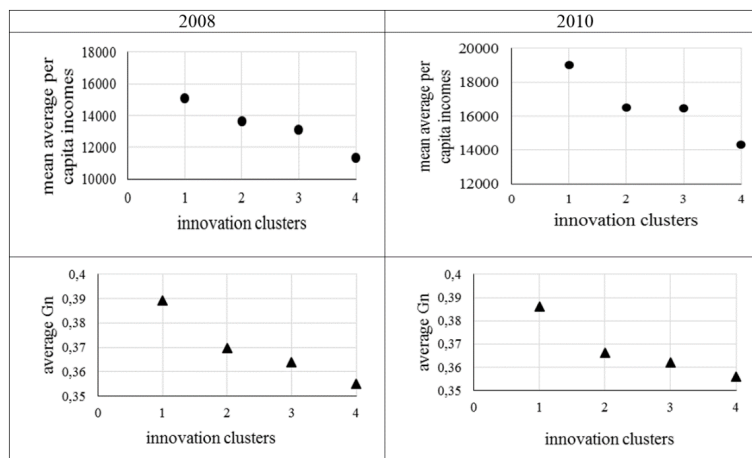


Figure 2. Correlation between the innovation cluster rank and average indicators of population incomes in 2008 and 2010

Table 4. Changes of the average per capita income and the Gini coefficient in transition from one cluster to another in 2010 as compared to 2008

Russian region	Transition from one cluster to another cluster (‘+’ – transition to a more innovative cluster, ‘-’ transition to a less innovative cluster)	Change of average per capita income (%)	Change of the Gini coefficient (%)
Tambov oblast	-2	-1,87	+0,64
Tver oblast	-1	+3,41	-1,56
Rostov oblast	-1	-1,70	+0,65
Kaliningrad oblast	-1	+7,60	-1,48
Republic of Dagestan	-1	+17,87	-1,63
Novosibirsk oblast	+1	+6,73	0,00
Magadan oblast	+1	+0,30	-1,37
Astrakhan oblast	+1	+13,17	-1,72
Orenburg oblast	+1	+8,45	0,00
Stavropol krai	+1	+7,79	+0,33
Kursk oblast	+1	-0,70	-0,45
Vologda oblast	+1	-3,40	+2,07
Penza oblast	+1	+7,21	0,00
Krasnodar krai	+1	+12,43	+0,73
Kirov oblast	+1	+3,43	+0,47
Republic of North Ossetia	+1	+5,30	+3,03
Kamchatka krai	+2	-0,06	-1,49
Republic of Mordovia	+2	+10,31	-0,58

In transition to a less innovative cluster in two regions out of five average per capita population incomes also decreased while in three regions they increased, this increase was especially essential in the Republic of Dagestan (+17,87 %). Out of 13 regions in which a transition to a more innovative cluster occurred average per capita population incomes increased in 10 regions and decreased in 3 regions, the greatest decrease was in the Vologda region (-3,40 %).

Based on the calculation results we can make a conclusion that there isn't any statistically significant dependence between the level of innovative development of regions, average per capita population incomes and their concentration coefficient (Gn). Such dependence becomes clearly apparent only when considering mean average per capita incomes by identifying innovative clusters. In our opinion, this fact can be explained by the peculiarities of the national economy and the state policy. The peculiarity of the Russian economy is its focus on exporting raw materials, imperfect

markets, a large transactional sector and region polarization. The state policy is characterized by the inconsistency of the methods used, a lack of any industry policy and any population incomes policy (Litvintseva, G.P., Stukalenko, E.A. 2010, Gilmundinov, V.M. 2011, Melnikov, V.V. 2012).

6. Implementation issue of state policy

The modern policy pursued in the field of income adjustment in Russia is directed at pulling the poorest strata of the population to the level of the poor and ignores the problem of differentiation of population incomes. In recent years the government has initiated various programs aimed at supporting lagging regions within a regional policy but so far they haven't resulted in any noticeable success.

With a growth of interregional differentiation being predicted in Russia, demands to the Federal government aimed at evening-out differences will increase. As Kolomak E. asserts, the policy of supporting the so-called 'points of increase' is improper because developing regions can improve their dynamics themselves. Besides, competition effects prevail over interregional cooperation effects. It is necessary to lower interregional communication barriers, which implies the improvement of the transport and communication infrastructure as well as to eliminate institutional barriers. A social policy aimed at supporting the population in lagging regions can intensify these measures by controlling interregional migration of the population and exerting stabilizing space influence .

Zubarevich N.V. notes that the role of the regional policy should not be overestimated. In Russia and Kazakhstan it has a dirigistic character, which reduces the efficiency of the decisions made. Measures of a social and institutional policy aimed at the human capital growth, targeted social support of the most vulnerable groups of the population and modernization of institutions can have a more significant effect. It is necessary to accelerate diffusion of innovations, to stimulate competition of regions and cities for investments and human capital as well as for the population mobility growth .

It is evident that even scientists' attitudes to some aspects of the economic policy are just opposite.

7. Conclusions

Out of the diversity of social institutions only the institution of minimum wages is actively used in the state policy of Russian population incomes. The state policy of regulating population incomes is carried out only in the field of reducing poverty. An active policy to decrease the differentiation of population incomes is not implemented and the instruments to achieve this goal are not made use of. This situation is aggravated by the transition to the innovative development strategy and by the appearance of new disproportions.

In general, a subsidiary but not a social model of the state characterizes the present state of the art in Russia. This model provides the redistribution of social expenditures in favor of the most vulnerable population groups and lagging regions. The self-withdrawal of the government from regulating the differentiation of population incomes results in negative consequences for society.

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