Drivers of economic growth and investment attractiveness of Russian regions

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Abstract. This paper deals with the identification and justification of the drivers of growth and regional development in Russia. Based on the regression analysis in this paper we consider the influence of the level of domestic demand and income inequality in the regions of Russia on the pace of their economic growth and their foreign investment attractiveness. The relationship of these indicators and their transformation in recent years are identified and analyzed.
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Introduction

Globalization processes remove the barriers of national and international economic systems. As a consequence, the world competitive space is changing. In modern conditions the country barriers of the international competitive environment are getting destroyed, and the international competition becomes more widely disseminated at the regional level. These processes are particularly noticeable for Russia, which entered the World Trade Organization in 2012.

Competitiveness of the country is now determined not only by its national advantage in the international division of labor, but also the combined level of competitiveness in all its regions. Moreover, increasing regional competitiveness has become one of the main sources of increasing competitiveness of the country as a whole. This trend is particularly relevant for the Russian Federation, in which there are significant fluctuations in the level of competitiveness for different regions, as well as a number of areas in which regional competitiveness can be significantly improved. The purpose of this paper is to define these areas and identify these reserves.

One of the main indicators of regional competitiveness is the investment attractiveness of the region. Factors of investment attractiveness of regions in Russia are changing: new factors appear, the impact of the existing factors changes. This paper deals with the identification and justification of factors and growth drivers of regional development in Russia.

The review of theoretical and empirical works

In recent years, domestic and foreign literature paid a lot of attention to the business climate in the Russian regions. The latter includes the investment climate in the region, which, in turn, is characterized by the investment attractiveness of the region. Its factors can be identified and classified by taking into account the structure of its objective component, which is determined by the investment potential and investment risk. The latter are also structured. In the paper we use the basic structure of investment potential provided in the World Development Report of the International Bank for Reconstruction and Development in 2005 [1] and developed in [2-4] (the "Expert" rating agency also uses the above procedure to rank Russian regions).

The results of studies by the World Economic Forum, based on surveys of the business community in Russia and dedicated to the identification of barriers to doing business in Russia, supplement the quotient field of the business climate of the Russian regions. In the presented ranking the acute problem of the development of public institutions in Russia, both formal and non-formal ones, is clearly apparent.

According to the survey, in 2012 in addition to traditional problems of the Russian economic system, such as corruption, bureaucracy, non-optimal level and structure of tax rates, limited access to financial resources, new issues in maintaining the international competitiveness of Russia, such as low-skill labor and low innovation potential, are forming.

Low level of development of the institutional environment and innovative potential of the Russian economy is confirmed by the formation

of the global competitiveness ranking (Global Competitiveness Index) for Russia presented in World Economic Report 2012-2013 [5].

Thus, the development of the institutional environment and increasing innovation activity are powerful drivers of international competitiveness and economic growth in Russia as a whole and in its regions in particular.

In a report on the competitiveness of Russia in 2012, presented by the Eurasia Competitiveness Institute (in partnership with Strategy Partners Group and Sberbank of Russia) the evaluation of the international competitiveness of Russian regions were first published. The presented technique allows them to compare the Russian regions not only with each other but also with more than a hundred of countries [6].

These facts allow us to consider the Russian regions as subjects of national and international capital markets, competing with each other and foreign subjects for investment resources. Taking into account the results of the set of studies on the factors of economic growth in the country context, the work examines the impact of the level of domestic demand and inequality of income in the region on the pace of economic growth and foreign investment attractiveness.

Econometric modeling

We implement the cross-sectional data modeling used annual values of a number of social and economic indicators in 80 regions of Russia, presented in handbooks and reports of Russian state statistic agency (Rosstat) for the period from 2000 to 2011 [7]. Regression model, supporting and evaluating the effects of some factors of regional economic growth, is presented in Table 1.

First, the model confirms the dependence of the rate of economic growth in the regions of Russia on their level of human development (according to the UN method), in particular, on the level of the gross regional product (GRP) per capita and literacy level of the previous year, as well as the growth of per capita GRP in the current year. GRP per capita is not only the element in assessing the level of human development, but also it reflects the level of income and expenditure in the region.

Thus, per capita GRP characterizes the level of domestic demand in the region. Therefore, the main result of the model is the identification the dependence of the economic growth rates in the region on the magnitude and dynamics of its domestic consumer demand. Literacy rate also contributes to economic growth.

Table 1. Factor analysis of the economic growth of regions of Russia in 2010. Method: Least Squares, Sample: 80

Dependent Variable: VGR10, GRP growth rate in 2010 in Russia				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C (constant term)	-3.962543	1.776578	-2.230436	0.0287
VC10M-VC9M	2.006535	0.182572	10.99035	0.0000
VC9M	-0.238089	0.036600	-6.505200	0.0000
EL	0.041143	0.017846	2.305440	0.0239
R-squared	0.639369	Prob(F-statistic)		0.000000

where VC9M and VC10M - GRP per capita in 2009 and 2010 respectively, in millions of Rubles, EL - the literacy rate in the region in 2010 (in %).

Table 2. Verification of stability and identify the dynamic characteristics of the model, which explains the differences in growth rates of the Russian regions

Variable	2005	2006	2007	2008	2009	2010
Dependent Variable	Annual growth rate GRP (gross regional product), %					
Constant term	1,228 (0,011)	1,237 (0,009)	1,253 (0,016)	1,214 (0,010)	1,016 (0,012)	1,133 (0,007)
Increase of the current GRP per capita,dVCM,	4,972 (0,485)	5,427 (0,607)	3,085 (0,416)	3,691 (0,331)	2,090 (0,169)	2,059 (0,186)
GRP per capita, VCM(-1)	-1,138 (0,202)	-1,165 (0,126)	-0,713 (0,121)	-0,741 (0,075)	-0,053* (0,049)	-0,233 (0,038)
R-squared	0,593	0,541	0,435	0,627	0,666	0,614
Prob(F-statistic)	0.000	0.000	0.000	0.000	0.000	0.000

where (-1) denotes the use of a lagged variable, with the lag in one year, the standard errors are presented in parentheses, dependent variables are presented in millions of Rubles.

According to the results of constructing the model, we can conclude that the differences in rates of economic growth in the regions directly determined by the magnitude of its growth in domestic demand. Moreover, the regions with higher per capita GRP grow on average slower than regions with lower per capita GRP, i.e. regions with lower per capita income grow faster, just as a number of developing countries grow faster than developed countries.

In order to verify the above model and assess the stability of the identified relationships a number of similar models for several years was built (see Table 2).

Modeling based on data for the period 2005-2010 leads to several conclusions :

1. Identified relationship and the overall model is dynamically stable. All of the new models are well specified.

2. All of the new models and estimates presented in Table 2 are statistically highly significant (except for the one obtained in the crisis year of 2009, it is marked by an asterisk), the probability of Null - hypothesis is less than 1% both for t-statistics and for F-statistics.

3. In the model, it should be noted steady trend of the values of coefficients at the independent variables. The coefficient of the dVCM reduced from

4.97 in 2005 to 2.06 in 2010. This result can be interpreted as a reduction of growth potential in consumer demand in the region in terms of its impact on the GRP growth rates for the period. The coefficient of the VCM (-1) changes from -1.14 to -0.23: thus, the differences in rates of economic growth in the regions eventually become less sensitive to differences in the levels of per capita income regions in the previous year. However, the qualitative nature of the specified relationship is not changed - the regions with a lower level of per capita income, with equal absolute increase of this variable and other conditions being equal, on average, grow faster.

Without establishing significant direct effect of income inequality on economic growth in the region, a number of models to identify statistically significant factors affecting income inequality in the regions of Russia were built. As the dependent variable regional Gini coefficient is taken (calculated by the method of the UN and Rosstat, see Table 3).

Table 3. Model explaining the differences Russian regions on income inequality. Method: Least Squares, Sample: 80

Dependent Variable: DK – regional Gini coefficient в 2010 г. (по методике ООН)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.370421	0.003542	104.5835	0.0000
VC9M	0.111531	0.015195	7.339820	0.0000
VC9M-VC8M	-0.226381	0.055361	-4.089174	0.0001
R-squared	0.421847		F-statistic	28.09138

where VC8M and VC9M - GDP per capita in 2008 and 2009, respectively, millions of Rubles.

The model presented in Table 3 is well specified. Its results can be interpreted as follows:

1. Income inequality is higher in regions with higher per capita GRP.

2. GRP per capita growth reduces income inequality Russian regions in 2010.

Table 4. Verification of stability and identify the dynamic characteristics of the model to explain the degree of income inequality in the Russian regions

Variable	2008	2009	2010
Dependent Variable	Regional Gini coefficient		
Constant term	0,369 (0,004)	0,367 (0,004)	0,370 (0,003)
GRP per capita, VCM(-1)	0,166 (0,030)	0,121 (0,032)	0,112 (0,015)
Increase of GRP per capita, dVCM (-1)	-0,068* (0,586)	0,029* (0,169)	-0,226 (0,006)
R-squared	0,418	0,400	0,422
Prob(F-statistic)	0.000	0.000	0.000

where (-1) denotes the use of a lagged variable by one period (year), standard errors are presented in parentheses; * denotes not statistically significant estimates, dependent variables are presented in millions of Rubles.

Like the process of verification of the model, which explains the differences in the pace of economic growth in the Russian regions, the model, the results of which are presented in Table 3, is also tested (see Table 4).

The data in Table 4 demonstrate the stability of previously identified relationships. Moreover, we see a steady trend of values of the coefficient at VCM (-1). It decreases with time, which means the diminution of the impact on the differentiation of regions per capita GRP on their differences in the level of income inequality.

It is also important to note the lack of a statistically significant effect of growth of per capita GRP, dVCM (-1), on the level of income inequality in the models 2008 and 2009.

The above facts partially support the S. Kuznets's hypothesis, according to which economic growth is first accompanied by increasing inequality in income distribution, and then it leads to its decrease (Kuznets 1955) [8, 9]. Many foreign researchers received confirmation of this hypothesis for samples of both developed and developing countries (Ahluwalia 1976a and 1976b) [10-11].

Furthermore, the results of the regression model explaining differences in the level of income inequality in the Russian regions are consistent with M. Partridge's results (Partridge, 1997) [12], who studied the relationship between economic growth and income inequality in the United States regions.

Table 5. Factor analysis of the level of foreign direct investment (FDI) in the regions of Russia in 2011. Method: Least Squares, Sample: 80

Dependent Variable: I11 - объем прямых иностранных инвестиций в российские регионы в 2011 г.				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-853071.3	252795.4	-3.374552	0.0012
I10	1.184201	0.154310	7.674174	0.0000
I10-I9	1.681622	0.399186	4.212632	0.0001
VC9	4.481476	1.214636	3.689563	0.0004
R-squared	0.991		Prob(F-statistic)	0.000000

where I9 and I10 - foreign direct investment per capita in 2009 and 2010 respectively, thous.of USD, VC9 - GRP per capita in 2009 and 2010 respectively, Rubles.

Finally investigate factors of investment activity of foreign investors in the Russian regions in 2011. As explanatory variables the foreign direct investment in the Russian regions in 2011 (I11) is used.

Table 6. Model explaining the growth of FDI in Russian regions in 2011

Dependent Variable: I11-I10				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-914179.5	248240.1	-3.682643	0.0004
I10-I9	2.153079	0.058147	37.02799	0.0000
VC9	5.178788	1.067878	4.849607	0.0000
R-squared	0.956350	Prob(F-statistic)		0.000000

The final results of the identification and analysis of these factors are presented in Tables 5 and 6. The model in Table 6 is obtained with reformatting the model in Table 5.

According to Tables 5 and 6 we can conclude the following: differences in the level and increase of foreign direct investment is largely determined by the differentiation in the level and dynamics of the previous activity of foreign investors, as well as the value of GRP per capita two years before the time of analysis. The variable VC9 explains 17% of the variation of the dependent variable. The crisis of 2008 led to the dynamic instability parameters of the models analogous ones constructed above in 2010 and 2009. This issue will be studied in subsequent studies in more detail.

Findings

As a result of the study of socio-economic indicators of the Russian Federation for 2000-2011 years the following relationships were established:

1. Economic growth of regions in Russia depends on the level and dynamics of GRP per capita and potential domestic demand. This dependence is stable over time, but its quantitative parameters change. In particular, economic growth becomes less sensitive to changes in domestic demand potential.

2. Direct relationship between economic growth and income inequality have not been identified. However, it is shown that there is a component that mediates this effect - GRP per capita, which in turn is an indicator of the level of human development in the region (according to the UN method), and the factor of the level of domestic demand in the region. Thus, another key area in explaining the impact of inequality on growth was justified, in addition to four others selected and emphasized by R.J. Barro (Barro 2000) [13, 14].

3. Level of income inequality in Russian regions is also determined by the level and dynamics of GRP per capita. This dependence is stable over time, but its quantitative parameters change. Thus, in explaining the differences in income inequality in the regions of Russia in 2010, unlike in 2008 and 2009, the increase in per capita GRP in the previous year accompanied by a reduction in income inequality in the region this year. This fact should be considered as an argument in favor of the Kuznets hypothesis (Kuznets 1955) [8] on the growth and subsequent smoothing levels of inequality in the process of the development of economic systems when considering the Russian regions as objects of spatial econometric analysis.

4. Taking into account the previous findings and comparing the results of the regression models built, it can be argued that during the study period higher growth of Russian regions accompanied by a higher income inequality in the regions of Russia.

5. Current investment activity of foreign investors in the Russian regions, as an indicator of their investment attractiveness and international competitiveness, is largely determined by the level and dynamics of investment activity of foreign investors in prior periods, as well as the value of per capita GRP in them for two years until analysis.

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