
Efficiency of Public Administration and Economic Growth in Russia: Empirical Analysis

Alla Kalinina¹, Elena Petrova, Marina Buyanova

Abstract:

This article presents the results of multivariate correlations between regional governance system performance indicators and key indicators of socio-economic territorial development based on modern economic and mathematical tools. The representation of the socio-economic system of the region as a space of key variables of socio-economic territorial development and regional authorities' performance indicators allows the use of canonical correlation analysis tools. The analysis is performed on the indicators calculated for the regions of the Russian Federation for the period of 2008-2010. As a result, weak correlation was found between subject-object variables of meso-level economic systems. A visible correlation in two sets is observed between economic territory development and indicators of executive authorities' performance such as the average monthly wage of civil servants of executive authorities of the Russian Federation constituent entities, tax and non-tax share of municipalities budget income in total municipalities budget income and the number of employees in the executive branch of the constituent entities of the Russian Federation. The lack of correlation between performance indicators of regional governance systems and socio-economic territorial development requires a revision of the existing formal approach to this evaluation.

Key Words: *Regional Executive Authorities, Governance System Performance Indicators, Evaluation of Socio-Economic Development, Canonical Correlations.*

JEL Classification :

¹Volgograd State University, Doctors of Economics, Associate professors

Correspondence: Alla Kalinina, Volgograd State University, 400062, Volgograd, Universitetsky av., 100, Russia. E-mail: nrprorector@volsu.ru

1. Introduction

Under current conditions of Russian economy modernization, executive authorities of the Russian Federation faced the need to revise traditional models of public governance that proved to be inadequate to new requirements of regional governance. Population demand for various types of public services is a key factor in creating the system of territorial governance. Participation of population in all stages of the process will specifically allow to take into account the needs and, depending on them, to adjust the funding of various spheres of public life [7].

In recent years the regions have implemented some measures aimed at improvement of tasks performance of government executive authorities and the quality of services provided to the population. Standards of social services for senior citizens and people with disabilities, Nomenclature and Provisions on the work of public institutions of social services, Lists of guaranteed social services and additional services with tariffs approved by resolutions of Regional Tariff Service were developed and endorsed by the Heads of local governments of various constituent entities of the Russian Federation. In addition, a variety of software systems to form a database of social services consumers were developed and implemented. However, the above-listed measures are not sufficient for a systematic approach to formation of regional governance mechanisms and provision of high-quality public services [6]. Moreover, experience of territorial governance in the last decades shows a clear trend of strengthening regional differences within national federal system. All this imposes requirements for the development of theses of modern theory of regional efficiency and coordination of obtained evaluations with the level of socio-economic territory development.

Modern theory and practice of regional governance offers various perspectives on problems of efficiency and development dynamics of meso-level economic systems. Thus, the method developed by the Government of the Russian Federation [15] defines a unified procedure for evaluating the performance of executive authorities of constituent entities of the Russian Federation in the accounting period in order to prepare an annual report to the President of the Russian Federation. It is worth mentioning that within the framework of the aforesaid methodology there were developed some algorithms allowing calculating the proportion of inefficient expenditure in total budget expenditures in various spheres of life of constituent entities of the Russian Federation. In this case quantitative evaluations are formed. The disadvantage of these algorithms, and, therefore, evaluations obtained on their basis, is the fact that the data from different constituent entities are used in the calculations, and, thus, the evaluation of inefficient spending of one constituent entity is put in dependence on the indicators of the other constituent entities.

The Federal State Statistics Service (Rosstat) in the last statistics digests "Regions of Russia. Socio-economic indicators" [16, 32-35] indicates the rank of the region along with the evaluation. The main indicators most commonly used for evaluation of regional development are unemployment rate and GDP per capita [9, 190]. Another method of analyzing the development of regions is an adaptive method of regional indicators space structuring. The centerpiece of proposed approach is a concept of a zone of acceptable (average) states which is defined as a certain neighborhood of average indicator values for the group of regions under consideration. Thus, the resulting structure of the space of indicators is determined not only by the size of the zone, but position in this space of the "center of mass" - the point defined by the average values of the indicators for the given set of regions [19, 172-181].

Questions of territorial administration performance evaluation are widely discussed in both foreign and Russian studies. There are two directions of this research in foreign practice. The first of them involves the inclusion of quality indicators into the evaluation system: the quality indicators of the efficiency of resource use and objective achievement are widely used in addition to the traditional control over the execution of planned budget. This line is represented in following terms: Good Governance [1], Performance audit [2].

The second direction is focused on improving the system of accounting and reporting. It is represented in the analysis of budget planning and controlling expenditure on a resource basis [10], performance measurements [12]. Between approaches and basic techniques, calculated by international organizations should be mentioned evaluation system WGI (The Worldwide Governance Indicators) [8] that is calculated by the World Bank.

In world practice are also used the seven most relevant indicators of governance performance: Corruption Perceptions Index (Transparency International), Global Integrity Indicator, Institutional Assessment Index (the World Bank's Country Policy), Indicators of the business environment and enterprise performance (the World Bank and EBRD); World Competitiveness Ranking (the International Institute for Management Development); Civil and political rights (Freedom House); Worldwide Governance Indicators (the World Bank) [4]. These indicators cover almost all aspects of general government activities, from health care (immunization rates, infant mortality), education (share of students, ratio between the number of teachers and students, results in international tests in mathematics), to research and development (applications for patents, expenditure on research and development). At the same time, these studies don't cover the modeling of correlation between the performance indicators of regional governance and level of socio-economic

development. It is important to create an adequate system of statistical indicators that allow such measurements.

2. Research Methodology

The aim of the present study is creating a representative statistical base for research on the performance of regional governance system through analysis of correlation between the indicators of performance of executive authorities and social and economic development of meso-level economic systems based on modern economic and mathematical tools. The analysis tool used in this paper is methodology of canonical correlation analysis which operates canonical correlations - correlations between related factor and resulting factor sets rather than individual indicators, as well as correlation and regression analysis tools [14].

Application of canonical correlations analysis is widespread in foreign empirical studies that reveal the problems of sustainable economic growth. From the perspective of the used modeling technique and considered dependencies describing the results, a number of foreign studies should be mentioned. In a study [20] canonical correlation analysis technique is applied to evaluate the relation between institutions, governance system and economic development of 123 countries. The work on data on 93 variables installed hidden relationship that allowed the authors to determine the properties of the institutional environment and governance system for countries with different economic development. In another study [11] the category of Good Governance reveals through the canonical correlations analysis of institution development indicators and economic growth. The canonical correlation analysis is also used for the formation of an indicator system of synthetic economic indices. In paper [21] the canonical correlations analysis is used to make a selection and to set relative weights of variables to evaluate the international competitiveness of countries.

In order to achieve the aims of the study the municipalities as a socio-economic systems are defined in two characteristic spaces:

1. Indicators of socio-economic territory development (SEi);
2. Performance indicators of the executive authorities of constituent entities of the Russian Federation (GMi).

This paper [13] presents a comparative analysis of methodological approaches to the analysis and evaluation of socio-economic development of the region and interregional comparisons of Russian and foreign researchers. On the basis of the results of these studies, the following indicators have been selected as main indicators of socio-economic development of the regions of the Russian Federation: SE₁- gross regional product per capita; SE₂ - volume of investment in fixed capital

(excluding the budgetary funds) per person; SE₃ - unemployment rate (ILO methodology), annual average; SE₄ - infant mortality rate, the number of deaths under 1 year per 1 thousand live births; SE₅ - number of students in educational institutions of higher professional education to 10,000 population; SE₆ - income per capita (in rubles a month.); SE₇ - population change (annual population growth, in percent). All indicators are yearly published by the Federal State Statistics Service (Rosstat) in the digest "Regions of Russia. Socio-economic indicators." This reliable statistical material has become a source of research data for the Volgograd region on all above-listed indicators for the period from 2008 to 2010.

The following indicators from the list of indicators recommended by the federal government have been selected as governance performance indicators: GM₁ - Expenditures of consolidated budget of a constituent entity the Russian Federation on health care: total; GM₂ - Expenditures of consolidated budget of a constituent entity the Russian Federation on general education: total; GM₃ - Overdue accounts payable from the state (municipal) institutions; GM₄ - Share of tax and non-tax revenue budgets of municipalities of total revenue budgets of municipalities (excluding subventions); GM₅ - Number of state-owned and unitary enterprises and in the constituent entity of the Russian Federation: total; GM₆ - Number of primary state (municipal) services provided in electronic form by the executive authorities of the constituent entity of the Russian Federation (the local authorities), by institutions of the constituent entity of the Russian Federation (municipal authorities); GM₇ - Average monthly wage of civil servants of executive authorities of the constituent entity of the Russian Federation; GM₈ - Number of employees in the executive branch of the constituent entity of the Russian Federation, one per 10 000 of the population; GM₉ - Expenditures of consolidated budget of the constituent entity of the Russian Federation on the wages of employees of state and local authorities. The data published on the official website of the Ministry of Regional Development of the Russian Federation has been used for the analysis [3]. The sample consisted of 219 values of the region for 2008-2013.

3. Research Methods

In this paper we use a method of canonical correlation which allows simultaneous analysis of correlation between multiple output variables and a large number of determining factors [5, 270]. In this case the lack of correlation both in the groups of result and factor variables is not required. Calculation algorithm of canonical correlation method is done in such a manner that original variables are replaced by their linear combinations, which are linearly independent. At the same time, there is a high degree of correlation between combinations of factors and linear combinations of the test output indicators:

$$U = V$$

$$a_1y_1 + a_2y_2 + \dots + a_5y_5 = b_1x_1 + b_2x_2 + \dots + b_6x_6 \quad (1)$$

U - canonical variable of result indicators.

V - canonical variable of factor indicators.

a_{pp} , b_{qq} - coefficients extracted from maximum condition of the pair correlation coefficient between the new indicators - the canonical variables.

It must be found out whether there is a correlation between groups of attributes in a sample, and if this correlation exists, if the change in one variable group goes on with the change in another.

The main objective of this method in economic analysis is, above all, to find out maximal correlations between the groups of original variables: indicators - factor and result qualitative variables. This method allows for better interpretation of results than other methods of multivariate data analysis.

4. Main Results

The results of the canonical analysis are presented in Table 1. The obtained canonical value of R is large enough (0,85) and highly significant ($p < 0,001$). Total redundancy shows that with the data of the values of all canonical roots and the value in the right set (efficiency of executive authorities) we can explain 34.6% of the variance extended in the left set of variables (socio-economic development). These results indicate a weak correlation between the variables of the two sets.

Table 1. Results of canonical analysis

N=219		Canonical Analysis Summ	
		Canonical R: 0,85486	
		Chi (63)=508,75 p=0,0000	
		Left Set	Right Set
No. of variables		7	9
Variance extracted		100,000%	81,713%
Total redundancy		34,68%	27,766
Variables:	1	SE ₁	GM ₁
	2	SE ₂	GM ₂
	3	SE ₃	GM ₃
	4	SE ₄	GM ₄
	5	SE ₅	GM ₅
	6	SE ₆	GM ₆

7	SE ₇	GM ₇
8		GM ₈
9		GM ₉

To test the significance of canonical roots we obtained chi-square statistics (see Table 2). The highest number of roots, which can be extracted, is equal to the minimum number of variables in the subsets, in this case -7. At the level of $p < 0,05$ the first five canonical roots are statistically significant .

Table 2. Chi-square for canonical roots

Root Removed	Chi-Square Tests with Successive Roots Removed (3. sta					
	Canonical R	Canonical R-sqr.	Chi-sqr.	df	p	Lambda Prime
0	0,854859	0,730784	508,7493	63	0,000000	0,088178
1	0,660502	0,436263	233,8346	48	0,000000	0,327537
2	0,467650	0,218696	113,7561	35	0,000000	0,581009
3	0,389220	0,151492	62,0533	24	0,000033	0,743641
4	0,285842	0,081706	27,6375	15	0,023995	0,876410
5	0,170010	0,028904	9,7803	8	0,280827	0,954389
6	0,131167	0,017205	3,6358	3	0,303591	0,982795

However, the final decision on the number of roots should be taken by the values of the extracted variance. In the left set the first root extracts 15% of the variance of the variables of socio-economic territory development, the other do less than 10%. In the right set only the fourth root has 20% variance, the variance of the remaining roots is less than 15%. To interpret the canonical roots we use the structure of factor loadings. The analysis of them allows for selection of the most significant variables from the GM_i influencing on socio-economic development of regions of the Russian Federation. These variables include: GM₇ - average monthly wage of civil servants of executive authorities of the constituent entity of the Russian Federation; GM₄ - share of tax and non-tax revenue budgets of municipalities of the total revenue budgets of municipalities (excluding subventions); GM₈ - number of employees in the executive branch of the constituent entity of the Russian Federation, one per 10 000 of the population (the second root). The variables with statistically significant loads are absent in the third, fourth and fifth roots. Thus, only three of the nine selected indicators of state and municipal governance have the most significant impact on socio-economic development of regions of the Russian Federation (see Figure 1).

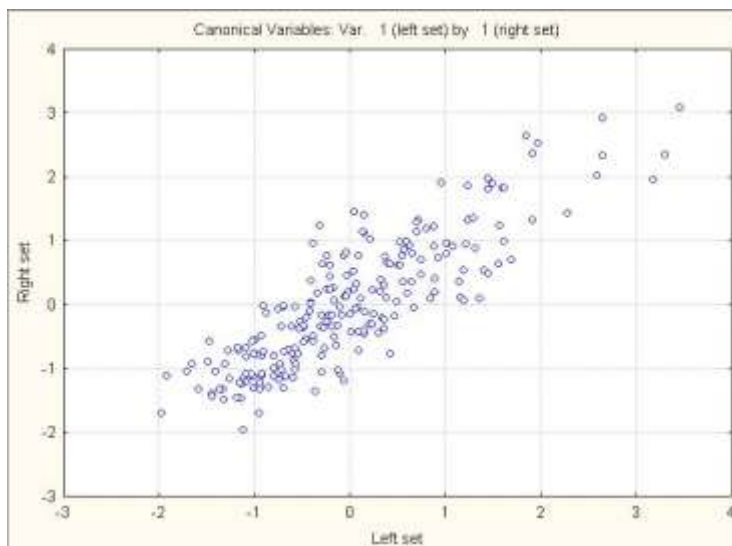


Fig. 1. The most significant correlation in the found canonical roots

Obtained evaluations from the extracted variance show that, in this context, it is advisable to consider economic development as a factor, and not as a result of high administrative budget expenditures. In order to identify the reliability of the results of canonical analysis, we construct a multiple regression equation. Thus, we normalize (using the "maximum - minimum" method) indicators of socio-economic development of regions of the Russian Federation CEi and construct integral index using epy indicator integration according to the additive scheme.

The use of "maximum - minimum" method allows balancing the outlying data, and shows the position of the region regarding to other regions. To solve this problem, we develop multivariate regression model, in accordance with the functional dependence of the type: $Y = f(X_i)$

In the regression model the linear form of function is used as a factor variables set of indicators GMi.

Multiple regression analysis summaries is presented in Table 3.

Table 3. Multiple regression summaries

Regression Summary for Dependent Variable: Y (Spreadsheet1)						
R= ,71247339 R ² = ,50761834 Adjusted R ² = ,48641530						
F(9,209)=23,941 p<0,0000 Std. Error of estimate: ,43274						
N=219	Beta	Std. Err. of Beta	B	Std. Err. of B	t(209)	p-level
Intercept			2,369708	0,179729	13,18486	0,000000
X1	-0,159524	0,126281	-0,000000	0,000000	-1,26324	0,207910
X2	0,726224	0,160801	0,000000	0,000000	4,51629	0,000011
X3	0,051198	0,053905	0,000000	0,000000	0,94977	0,343324
X4	0,230336	0,053369	0,010500	0,002433	4,31595	0,000025
X5	-0,308324	0,087352	-0,000648	0,000184	-3,52967	0,000512
X6	-0,034792	0,049579	-0,000134	0,000192	-0,70175	0,483614
X7	0,396662	0,057552	0,000025	0,000004	6,89224	0,000000
X8	-0,154352	0,056141	-0,011018	0,004007	-2,74936	0,006494
X9	-0,088331	0,146880	-0,000000	0,000000	-0,60138	0,548237

As a result, we have received the following multiple regression equation of the form:
 $Y = 2,4 + 0,0000 X2 + 0,01 X4 - 0,001 X5 + 0,00003 X7 - 0,01 X8$ (2)

Analysis of the model adequacy has shown that the coefficients of the regression model and statistical evaluation of the model and its parameters are significant: the multiple correlation coefficient is equal to 71% that indicates the result variable can be adequately explained by independent variables included in the model. In the calculations the original set error probability level is equal to 5% ($p=0,05$). In the resulting model the expected values of the standard errors for the coefficients of the regression model were less than a set level.

The regression analysis confirmed the results of canonical analysis and identified the influence of the same indicators. But the values of the parameters of the regression model are so low that they have no significant impact on the process under study.

5. Discussion

Conducted by the authors research of correlation between regional governance system performance indicators and socio-economic development indicators demonstrates a weak statistical correlation of those indicators both on regional and municipal levels. Obtained results establish that higher maintenance expenses of local executive authorities could be explained by the better socio-economic conditions of the region rather than vice versa. The researchers developed a system of performance evaluation indicators for territorial administration taking as a basis

the list of official methodology developed by the Government of the Russian Federation.

The research showed that the main methodological problem is the development of a system of government bodies' performance indicators, which should reflect the achievement of the objectives of executive authorities and, furthermore, should have a high correlation with the main indicators of socio-economic development of the area.

The authors suggest that the system of such indicators should be formed on the basis of the process approach, taking as a basis the strategic development indicators of the area and the processes of government work that provide the achievement of settled objectives. Currently all subjects of Russian Federation have almost completed development and approval of strategic development plans for the period up to 2020. Building the indicators chain "Strategic guidelines" ↔ "Results of executive authorities' process activities" will reveal how the functioning of government bodies affects the achievement of goals.

Furthermore, the quality of public services should be measured as the population (customer) satisfaction score and taken as a separate unit of such a system of indicators; that can be obtained by carrying out quantitative sociological research. It is appropriate to include in the evaluation of the quality of regional government chiefs performance an indicator of the objectivity of the regional elections, since the institution of elections in recent years has lost the trust of citizens. An important component of the evaluation is, in our opinion, the response of the executive authorities to requests of citizens. All such complaints contain the information on specific violations or problems. By systematizing those complaints we can clearly see the interrelation of causes and effects, events and processes, taking place on different levels of functioning of economic systems. Active use of citizens' complaints in the evaluation can help to identify the shortcomings of executive authorities and contribute to taking measures to eliminate them; it would lead to a constructive dialogue with civil society.

Another important issue that should be noted is the shortcomings of the official state statistic, its collection and quality, more specifically: the lack of essential indicators (e.g., indicators that show the state of the market economy in the regions and detailed business statistics, industrial production statistics, etc. .) [9, 65]; lack of information on external relations of the regions; lack of open access to the data (some details are still not available for public use, for example, information on natural resource stocks, private companies data; in some regions statistical reports are not being published at all, e.g., in the Chechen Republic); a significant delay in the publication of statistical information in the open access; shortcomings of some of

indicators (e.g., infrastructure indicators are criticized for inadequate reflection of actual situation, because the available data usually do not take into account the deterioration, loading of various elements of the infrastructure, potential usage of the infrastructure); most of the indicators does not reveal the causes of the difference between the regions in the parameters of their socio-economic development.

Thus, currently used methods of the executive authorities' performance evaluation at various levels of governance allow evaluating their activities only on basis of generalized statistical indicators that do not reflect the specific objectives, conditions and characteristics of the different regions. This requires further development of existing approaches of executive authorities' performance evaluation in the direction of taking into account strategic guidelines of the area, development of an appropriate system of indicators, as well as development of methodological tools for the measurements.

6. Conclusion

Thus, the results of canonical analysis of indicators of the formed system showed the presence of a weak statistical correlation between the executive authorities' performance and the indicators of socio-economic territory development. It was found out that higher expenses on local authorities can be explained by better socio-economic conditions in the region. This fact indicates that the used system of statistical indicators of local governance performance evaluation is an arbitrary list of indicators and does not meet the basic principles and methodological approaches of performance evaluation.

References

- Andersen, J.L.(2000). Governance as part of performance audit examination. *EuroSAI*, 7, 37-40.
- Andersen, J.L.(2004). New guideline for performance audit from the National Audit Office of Denmark. *EuroSAI*, 10, 33-36.
- Arkhiv. Otsenka deyatelnosti organov ispolnitelnoy vlasti subyektov Rossiyskoy Federatsii v 2007-2011 gg [Archives. Performance evaluation of executive authorities of constituent entities of the Russian Federation in 2007-2011]. Regional Development Ministry of the Russian Federation. http://www.minregion.ru/activities/monitor/exec_evaluation. Accessed 17 April 2014
- Buduru B., Pal, L.A. (2010). The globalized state: Measuring and monitoring governance. *European Journal of Cultural Studies*,13, 511. <http://ecs.sagepub.com/content/13/4/511>. Accessed 19 January 2014
- Dubrov, A.M., Mkhitaryan, V.S., Troshin, L.I. (2003). *Mnogomernnye statisticheskie metody* [Multivariate statistical methods], Moscow: Finances and statistics.

- Kalinina, A., Borisova, A. (2013) The monitoring of the e-government projects realization in the South of Russia. NETNOMICS: Economic Research and Electronic Networking, November, Volume 14, Issue 3, 119-127.
- Kalinina, A., Sokolov, A. (2013) Jeftektivnost' upravlenija regionom v uslovijah modernizacionnyh preobrazovanij rossijskoj jekonomiki i razvitija informatizacii. Jekonomika regiona,3, 112-121
- Kaufmann, D., Kraay, A., Mastruzzi, M. (2010). The Worldwide Governance Indicators: Methodology and Analytical Issues. World Bank Policy Research Working Paper No. 5430, Washington, D.C. [http:// http://ideas.repec.org/p/wbk/wbrwps/5430.html](http://ideas.repec.org/p/wbk/wbrwps/5430.html). Accessed 26 May 2014
- Kuznetsova, O.V., Kuztsov, A.V. (2012) Sistemnaya diagnostika regiona [Regional system diagnostics], Moscow: Publishing group URSS.
- Likierman, A. (2003) Planning and controlling Public UK expenditure on a Resource Basis. Public Money & Management, January, 45-51
- Meisel, N. (2008). Is "Good Governance" a Good Development Strategy? AFD Working Paper No. 58 <http://www.afd.fr/webdav/site/afd/shared/publications/recherche/Scientifiques/Documents-de-travail/058-document-travail-VA.pdf>. Accessed 17 April 2014
- Outcome data measurement Unfinished business Evaluation of data for outcome measurement for selected Indigenous service delivery programs (2002). http://www.anao.gov.au/uploads/documents/Outcome_data_measurement_Unfinished_business_report.pdf. Accessed 10 December 2013
- Petrova, E.A. (2013). Teoretiko-metodicheskie podkhody k analizu sotsialno-ekonomicheskogo razvitiya regiona I mezhregionalnye sopostavleniya [Methodic-theoretic approaches to socio-economic development analysis and interregional comparison], Vestnik Volgogradskogo gosudarstvennogo universiteta (Science Journal of Volgograd State University. Global Economic System), Series 3. Economics. Ecology, 1 (22), 46-55.
- Petrova, E.A., Shevandrin, A.V., Trukhlyaeva, A.A. (2013). Intellektualnyy analiz dannykh: statisticheskie metody [Database mining: statistical methods], Volgograd: Konsalt, ISBN № 978-5-906440-01-3.
- Postanovleniya Pravitelstva Rossiyskoy Federatsii ot 3 noyabray 2012 goda № 1142 „O merakh realizatsii Ukaza Prezidenta Rossiyskoy Federatsii ot 21 avgusta 2012 g. № 1199 “Ob otsenke jeftektivnosti deaytelnosti organov ispolnitelnoy vlasti subyektov Rossiyskoy Federatsii” [Decree of the Government of the Russian Federation dd. 03.11.2012 No. 1142 “On measures for fulfillment of the Russian Federation Presidential Decree dd. 21.08.2012 No. 1199 “On performance evaluation of executive authorities of constituent entities of the Russian Federation”], Regional Development Ministry of the Russian Federation. http://www.minregion.ru/upload/documents/2012/11/081112/post_1142.pdf. Accessed 17 April 2014
- Regiony Rossii. Sotsialno-ekonomicheskie pokazateli 2011 [Regions of Russia. Socio-economic indicators 2011]. Moscow: Rosstat.
- Reyting sotsialno-ekonomicheskogo polozheniya regionov – 2012. Uroven sotsialno-ekonomicheskogo razvitiya regionov. (2012). [Rating of socio-economic position of regions -2012. Socio-economic level of development of regions – 2012.

-
- http://riarating.ru/regions_rankings/20120702/610227349.html. Accessed 17 April 2014
- Suspitsyn, S.A. (2004). Baromenry sotsialno-ekonomicheskogo razvitiya regionov Rossii [Barometers of socio-economic position of regions of Russia], Novosibirsk: IEOPP SO RAN.
- Suspitsyn, S.A.(2002). Proyekt SIRENA: metody izmereniya I otsenki regionalnoy acimmetrii [Project SIRENA: calculation and evaluation methods of regional asymmetry], Novosibirsk: IEOPP SO RAN.
- Verspagen, B. (2012). Stylized facts of governance, institutions and economic development. Exploring the institutional profiles database. Working Paper Series on Institutions and Economic Growth: IPD WP05. 36. <http://www.merit.unu.edu/publications/wppdf/2012/wp2012-036.pdf>. Accessed 19 January 2014
- Wenzel L., Wolf, A. (2013). Towards a new measure of a country's competitiveness: applying canonical correlation. HWWI Research Paper. Nr. 144. http://www.hwwi.org/uploads/tx_wilpubdb/HWWI_Research_Paper_144.pdf. Accessed 19 January 2014

