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GEORGIY BORSHCHEVSKIY

THE APPLICATION OF QUANTITATIVE METHODS FOR STUDY OF THE CIVIL SERVICE REFORM

The civil service of the Russian Federation is now entering a new stage of reformation. The implementation of the Federal Program for 2009-2013 was accomplished and now a similar program for 2015-2018 is being prepared.

Analysis of the results of the reforming the state apparatus in recent decades suggests that many of the goals were not achieved. The experience of civil service reforms in Russia shows that it may be difficult to evaluate the effectiveness of these activities due to the lack of clear quantitative indicators and objectives of the reforms.

Foreign studies show that it is possible and necessary to apply quantitative methods in public administration. American authors, judging by their publications, on average, resort to the use of quantitative methods more often than their European counterparts [Repucci, 2014]. This is probably due to the availability of various quantitative databases in the United States [Seong, Lewis, 2013].

In our country such methods are not trendy due to the limited data available and the lack of socio-political demand for the reformation of the state apparatus [Bartsits, 2010; Barabashev, Kindras, 2014]. For this reason, in many cases, we had to collect data by ourselves during our research study.

This paper is based on the study entitled «Development of guidelines for the formation of indicators for evaluating the effectiveness of the civil service reform, given the dynamics of the socio-economic development of the Russian Federation.» The study is being carried out on our own initiative. Some of its findings have already been published. It is not possible to show each stage of the study in this brief article, so let us just touch on the methodology, specific conclusions and the prospects for future research.

The research hypothesis can be formulated as follows: *there are historical patterns of the civil service reforms that can be quantitatively described.*

The hypothesis sets the following limitations to this study.

First, specific features of the civil service system (its closeness and isolation) determine the limitations of original data available.

Second, a set of indicators which are used in the official statistical monitoring of civil service is very limited.

Third, a comparative analysis of the process of civil service reformation in a historical perspective is limited by the necessity to use homogeneous original data.

The consequence of these restrictions is that it is possible to use only the most generalized and available quantitative data characterizing the development of the civil service system. Such data include the following:

- the total number of government bodies,
- the total number of government functions,
- the number of civil servants of the central state administration and regional departments of federal government bodies;
- the average monthly salary of federal civil servants, which is different in the central state administration and in regional departments of government bodies.

These data were collected by the author himself as well as obtained via calculations.

In order to understand the relation between the input pulses of administrative reforms and the effect of them, it is required that a study be carried out over a large period of time, namely several decades and more. Thus this study was conducted within the time frame from 1991 to 2014. It covers the entire period of the latest development of the national civil service, from the time of the Soviet Union up to the present day.

The subjects of the study were the quantitative characteristics of the federal executive bodies, further referred to as government bodies.

In every year of the research, the study determined the number of government bodies and the number of functions they had. Legal acts were the source of data about functions. Counting the total number of functions was carried out using a special methodology. We did not

ПРИМЕНЕНИЕ КОЛИЧЕСТВЕННЫХ МЕТОДОВ ДЛЯ ИЗУЧЕНИЯ РЕФОРМИРОВАНИЯ ГОСУДАРСТВЕННОЙ СЛУЖБЫ

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Аннотация: Автор, анализируя данные исследований, представляет тенденции развития государственной службы. Дается интерпретация сопоставимых данных на нескольких уровнях и результатов анализа, проведенного в течение длительного периода. В статье объясняется, какое влияние на результаты исследования они оказывают.

Ключевые слова: эффективность, реформа государственной службы, социально-экономическое развитие, органы государственной власти, государственные функции.

seek to detect duplicate and redundant functions; we only counted their total number using syntactic methods.

Also, the number of civil servants was determined. Previously, we developed a classification of civil service positions which allowed us to identify comparable groups of ministry employees according to their functions over the period from the Soviet era to the present day [Borshchevskiy, 2015].

The average size of civil servants' salaries was included in the study. For the period from 2004 to 2014, the information was taken from the published statistics. For the earlier period, the author had to make calculations of payments by himself. In order to make salaries comparable, all figures have been adjusted for inflation according to the GDP deflator. The monetary reform of 1992-1993 and the devaluation of the ruble in 1998 were also taken into account as they are related to the changes in the value of money.

Applying the described methodology allowed us to obtain comparable data (see **Table 1**), which may be interpreted on several levels.

The following figures show summarized data in different units of measurement. This allows visualizing processes that are various in scope. It should be noted that it is important not to compare the concrete figures of each

Figure 1. Dynamics of quantitative indicators by the total number of government bodies, 1991-2014

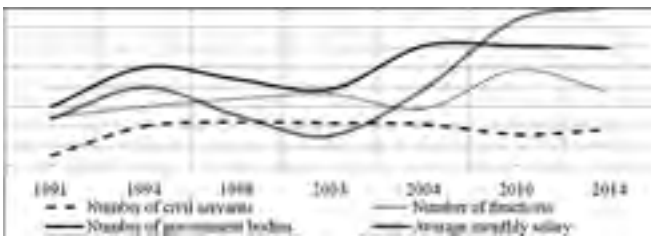


Figure 2. Dynamics of some derived indicators, 1991-2014

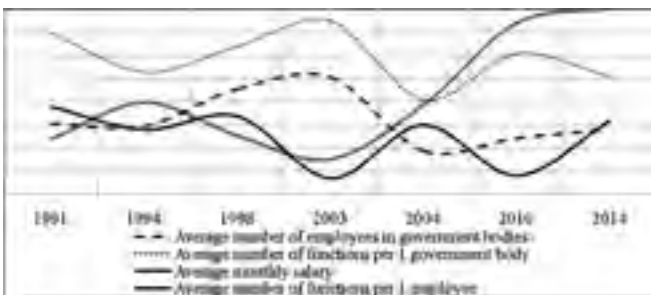


Table 1. Indexes for quantitative analysis

Years	Number of gov bodies	Number of functions	Number of civil servants		Average salary (thousand of rubles per month)	
			in headquarters	in regions	in headquarters	in regions
1991	52	4505	25317	47750	0,370	0,350
1994	70	5010	39978	132016	228,1	228,1
1998	64	5482	25691	270900	2,9	1,6
2003	59	5634	26900	343700	8,5	6,9
2004	82	4961	24978	401789	16,1	7,5
2010	81	6876	29650	470500	58,5	26,4
2014	78	5786	30283	420943	100,9	36,6

variable, but to observe the overall trends of changes in each of the indicators.

Figure 1 below shows that there is a relationship between the total number of public bodies and the number of functions they perform: these curves are inversely related to each other. This non-trivial relationship has an empirical nature. The study of the causes and nature of the relationship between these parameters must become the subject of an independent analysis.

We can see that in the last decade, there was a tendency to reduce the total number of civil servants and government bodies along with increasing the number of public functions performed by them. The increase in salaries was going relatively faster than the increase in the number of functions.

Figure 2 shows the results of analyzing the average number of employees in government bodies, the average salary and the average number of functions per government body as well as the average number of public functions per employee. The latter does not refer to personal responsibilities of each civil servant, but to the average number of functions of the government body per one employee in it.

A visible relationship exists between the number of civil servants in a government body and the number of functions performed by them. In the period of 1991-2004, this relation was directly proportional, but in the last decade there was an increase in the number of functions accompanied by the reduction in the number of employees on average in each government body. Predictably, the number of state functions per employee is increasing. There is a positive relation between the number of functions per employee and their average salary.

Figure 3 shows the relation between dynamics of the average salary of civil servants and different indicators of corruption, which include cases of bribery, the place of Russia in the ranking of countries in terms of corruption and the Corruption Perception Index determined by Transparency International.

Figure 3. Dynamics of salaries of civil servants and corruption in Russia, 1991-2014

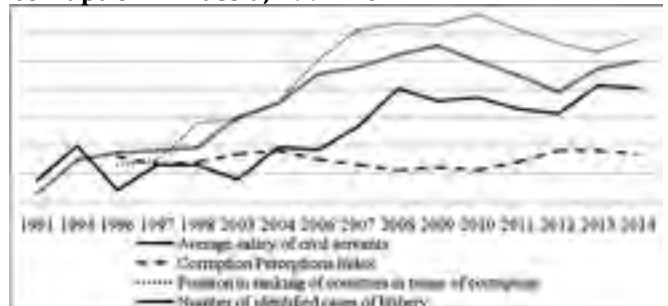
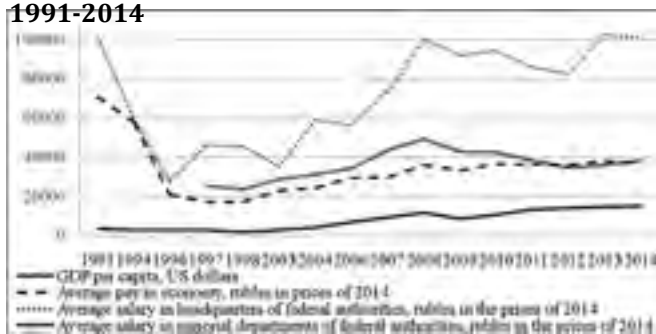


Figure 4. Dynamics of GDP per capita, average pay in the economy and average salary of civil servants, 1991-2014



The working hypothesis was based on the assumption that an increase of the average salary of civil servants will be accompanied by a reduction of corruption. However, the empirical data presents a different picture. A direct correlation between the growth of the average salary of civil servants and the growth of corruption was revealed. It should be noted that we are not saying there is a causal relation, but only that these processes coincide in time. This is an interesting material for further research and planning of government decisions.

In **Figure 4**, you can see the changes of such indicators as the size of GDP per capita and the average level of salaries in the national economy compared to average salaries of civil servants in the central offices and regional departments of government bodies. To make it clearer, all monetary values are expressed in the prices of 2014.

It is seen that during the last two decades there was a clear relationship between the dynamics of GDP and the average salary of employees. Thus, it is clear that the decline in GDP in 2008-2009 led to a proportional change in the level of payment. It can also be seen that the level of payment of civil servants at the territorial level is close to the average salary in the economy. The payment growth in central offices of government bodies is going at a faster pace.

A correlation analysis reveals relations between random variables. Application of this method is justified in cases where the number of observations substantially exceeds the number of analyzed factors. We fulfilled this condition as the number of analyzed government bodies each year was more than 60; the total number of observations at all "checkpoints" is more than 200.

Besides, the correlations are determined only for a qualitatively homogeneous set of baseline data; satisfying this requirement in the study is due to the methodology for collecting data at all "checkpoints".

Table 2. Correlation matrix of quantitative indicators, 1991-2014

Variables	Nf	Ne	S	T	Nfe	Nft	Net	St
Nf	1.000							
Ne	0.343***	1.000						
S	-0.048	0.029	1.000					
T	0.250***	0.185***	-0.339***	1.000				
Nfe	0.045	-0.332***	-0.120*	-0.014	1.000			
Nft	1.000	0.343***	-0.048	0.250***	0.045	1.000		
Net	0.094	0.232**	0.142	.	-0.134	0.094	1.000	
St	-0.028	0.016	0.923***	.	-0.095	-0.028	0.150*	1.000

In order to carry out the analysis eight factors were identified; they can be considered as random variables. They were assigned the following designations:

Nf – the number of government functions;

Ne – the number of employees in headquarters of government bodies;

S – average monthly salaries of civil servants in the central office of government bodies (in prices of 2014);

T – the existence of regional divisions of a federal government body;

Nfe – the number of government functions per one employee of the central office;

Nft – the number of functions of regional divisions of government bodies;

Net – the number of employees in regional divisions of government bodies;

St – average monthly salaries in regional divisions of government bodies (in prices of 2014).

The results of the correlation analysis of these indicators are presented in **Table 2**.

The strongest correlation (over 90 per cent) was observed between the size of salaries in the central office and regional subdivisions of government bodies. This means that in those bodies in which employees of the central office receive higher salaries the civil servants in the regional divisions have higher salaries compared to the employees of regional divisions of other authorities.

There is a "weak - average" correlation (about 30 per cent) between three pairs of indicators. The relationship between the number of functions of government bodies and its number of employees in the central office is positive. There is a negative correlation between the indicators of the average number of functions per employee and the number of employees of a government body. Finally, there is a negative relation between the size of the salary in the central office of a government body and the existence of its regional divisions. This is an unusual relation which should be further explored by constructing a regression with more data.

In addition, there are statistically significant positive relationships with a relatively weak correlation (18 to 25 per cent) between the number of functions of a government body and the existence of its regional divisions, between the number of employees in the central office and employees in regional divisions; a similar relationship is found between the number of employees in the central office and existence of regional divisions.

All these relationships have a practical value with respect to rationing the number of civil servants and introducing mechanisms of payments based on performance.

To develop the idea of a quantitative analysis, it may be worth establishing a causal link - a non-trivial relationship between the workload of civil servants and their salaries. To this end, the general hypothesis of this study, given in the beginning, was further refined and added with a technical hypothesis formulated as follows: *there is a positive relationship between the*

level of remuneration of public servants (*S*) and effectiveness of their work, which can be approximated by the number of government functions per one employee of the central office of government bodies (*Nfe*).

This hypothesis is economically viable because the compensation of employees should respond to the products they produce. This technical hypothesis is tested on a panel regression, built on “checkpoints” of the study. It managed to eliminate the fixed effects inherent in different bodies, which in turn makes it possible to assess the relationship between variables with greater certainty.

The result of the regression analysis was the opposite

Table 4. Panel regression

Variables	S
Nfe	-0.144*
Const	11.07**
Number of observations	206
R	0.014

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

of the expected relationship between the number of government functions per one employee and the level of the average remuneration in government bodies. This dependence can be interpreted as follows: increasing the number of functions per employee by 1 percent leads to a decrease in the average salary in the central office of the government body by 0.14 percent. Although the statistical coefficient has only a marginal significance (0.08), it is clear from the data that the expected strong positive relation between these variables does not exist.

The above result is different from what was obtained during the primary analysis (see Figure 2) where a positive relation between the number of functions per employee and the average salary was observed. This difference can be explained by the aggregation of data in the regression analysis which compares not the total values but the individual characteristics of each analyzed government body. Using micro-data about individual bodies gives a more accurate picture.

Upon consideration of these results, it can be concluded that the salaries of civil servants in the analyzed

period were only slightly related to the amount of functions performed by a government body. This is valuable information for a further study.

To sum up, it can be stated that our findings are consistent with the results obtained by other authors and with the current reality; therefore, they may be regarded as reliable. We understand the existing limitations and risks of the quantitative analysis; however, today these methods are the most accurate tool for the solution of the existing research problems.

The findings can be used in the foreseeable future for the preparation of legal acts and the civil service reform programmes. The theoretical significance of the study lies in the testing of a number of methodological assumptions and developing a coherent programme for further research, which can go in the following directions.

Firstly, the time frame of the study should be extended. Holding across-cutting analysis with a horizon of 30 years or more will help to formulate global development trends of the civil service system.

Secondly, it is necessary to collect more data and to extend its spectrum as well as to introduce more “checkpoints”. This will allow the use of finer methods of the quantitative analysis and will give more detailed and accurate results.

Thirdly, it is reasonable to shift from the study of the overall set of government bodies to the study of sectoral groups which perform similar functions. Consideration of the development parameters of these groups in the context of changes in macroeconomic indicators in economy sectors will allow us to see the relations between the development parameters of government bodies and the context of changes in the national economy.

Finding solutions to these problems is extremely important in keeping the ongoing modernization of public administration in Russia. On this basis, a methodological framework may be developed that will help to link indicators of the civil service reform with the processes of social and economic development of the country.

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Summary: The paper provides interpretation of comparable data on several levels and of the results of an analysis carried out in the course of a long period. The author, analyzing the data from studies, presents trends in the development of public service. The article explains what influence the findings of the research carry.

Keywords: efficiency, civil service reform, socio-economic development, indicator, assessment, government bodies, government functions.

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