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Impact of Qualification and Working Conditions on Civil Servant Pay Levels in Russia

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Abstract

The article is devoted to the assessment of qualification and working conditions which influence civil servant pay levels. The paper analyses two groups of measures: qualification and professionalism measures (e.g., level of education, work experience, etc.) and working conditions measures (e.g., work location, working hours, etc.). The empirical base of the research is the survey conducted by the Russian Public Opinion Research Center (VTsIOM) in 2017. The results of the regression analysis show that there are distinctions in measures determining civil servants' pay differentiation in comparison with the average pay in the economy and with the civil servants' expected pay. Civil servant pay levels should be more explained by qualification and professionalism than it is now. The research results would be useful for the optimisation of the civil servant pay system in Russia.

Keywords:

allowances, bonuses, civil servants' pay, civil service, measures of civil servants' pay, professionalism, qualification, remuneration, working conditions

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1. Research problem statement

In Russia the civil servant pay levels and structure differ a lot from the pay system in the Russian commercial sector and foreign countries. The civil servant pay structure consists of many components not common in the labour market. One part of these components links to qualification and professionalism, the other one – to working conditions. There are 2 main questions to improve the civil servant pay system: what components mostly stimulate civil servants, and what measures significantly determine the civil servant pay levels: job positions, knowledge, etc.

According to the Federal Law from July 27, 2004 No. 79-FZ "On the State Civil Service of the Russian Federation", the civil servants' pay consists of an official salary, a salary for a class rank, and additional payments, including allowances for work experience in the civil service, special conditions of the civil service, work with information constituting a state secret, as well as bonuses for completing difficult tasks and cash incentives.

At present, there is a non-competitive civil servant pay levels and the absence of a systematic approach to the organisation of the civil servants' salaries in Russia. In 2017, the Russian Public Opinion Research Center (VTsIOM) conducted a survey of civil servants on their satisfaction, motivation, pay, qualification, project work, key performance indicators, and applied technologies in public administration.

According to the results of the survey by VTsIOM in 2017, a high level of dissatisfaction of civil servants with their pay levels, compared to salaries in commercial companies, was revealed. Answering the question "In your opinion, are the civil servant pay levels in your government body attractive in comparison with the pay level in commercial companies in your region?", most of the respondents (77%) believed that their salaries in government bodies were inferior to those in the commercial sector in their region (Figure 1).

Figure 1:

Share of responses to the survey question "In your opinion, are the civil servant pay levels in your government body attractive in comparison with the pay level in commercial companies in your region?", %



Source: Author's own compilation based on the survey of civil servants conducted by VTsIOM in 2017.

The results of the VTsIOM survey indicate that the majority of civil servants (59%) consider low salaries as the first and main reason for leaving public service. According to 67% of the surveyed respondents, the increase in pay is one of the main factors stimulating the effectiveness of work. A comparative analysis of the civil servants' average pay expectations shows that the current level of their pay is 64% lower than expected to perform official duties well.

The civil servant pay structure is formed from a fixed part (official salary) and a variable part (various additional payments and bonuses). The most common practice, according to the results of the VTsIOM survey, is the ratio in which the fixed share in the civil servants' pay is 30-50%, and the variable part is 50-70%. The share of guaranteed payments to civil servants is very low and, therefore, allowances and bonuses are compensatory but not incentive at all. According to the survey results, the surveyed civil servants consider that the most optimal size of the fixed part of their pay should be 70-90%.

Thus, the non-competitive level of the civil servants' pay and its unbalanced structure lead to a lack of motivation. In this regard, the following questions become pertinent: "What measures have the greatest influence on the civil servant pay levels? What is the relationship between civil servant pay levels and their qualifications? What determines civil servants' pay differentiation?."

The study tests the following interrelated research hypothesis:

Hypothesis 1. Civil servants' pay differentiation, in comparison with the average pay in the economy, is mostly determined by qualification and professionalism measures.

Hypothesis 2. Civil servants' pay differentiation, in comparison with the civil servants' expected pay, is mostly determined by working conditions measures.

The main idea of the research is to determine what affects civil servants' pay differentiation more: qualification and professionalism (based on the theory of human capital) or working conditions (based on the theory of compensating differences).

The paper is structured as follows. The literature review presents studies revealing the relationship between civil servants' pay and various measures. The following parts of the article describe the research methodology and regression models. The final part presents the results of a regression analysis of qualification and professionalism measures and working conditions measures affecting the civil servant pay levels in Russia.

2. Literature review

Workers' remuneration and measures interrelated with it are the subject of research by many scientists. However, issues related to measures affecting salaries in the public sector have received little attention in the literature, which is confirmed by the low number of articles on this topic, both in Russia and abroad.

2.1. Influence of qualification and professionalism measures on the civil servants' pay

Many researchers study the relationship of pay with the level of education, work experience, skills, knowledge, competencies, and professional qualities. In order to substantiate the part of the hypothesis revealing the relationship between qualification and pay, most researchers use a regression analysis.

Becker and Mincer found that the pay rate is related to the level of education. Individuals make decisions about obtaining and continuing education, weighing their benefits and costs, balancing the expected economic return on learning with the time and financial costs that it will require (Mincer, 1962; Becker and Chiswick, 1966). Moreover, Mincer noted that women receive lower salaries, since they accumulate less human capital than men (Mincer and Polachek, 1974). Later, Becker established the relationship not only between education and salary, but also between work experience, professional skills and salary. He investigated the economic consequences of investing in education and skills acquisition and the impact of human capital investment on individuals' salaries (Becker, 1993).

Based on the results of the panel data analysis, the significance of the Mincer-type equation was confirmed. The main measures affecting salaries in Russia are the level of education, work experience, employee qualification, gender, and place of residence of an employee (a city or a village) (Dekina, 2016). Different types of higher education graduates' competencies (discipline-specific competencies, general academic competencies, and managerial competencies) play different roles in the labour market. For example, the specialised/disciplinary competencies acquired at university (specific theoretical knowledge) give graduates a comparative advantage when working within their own subject areas and, therefore, pay off for those graduates who can find employment in their own subject areas (Heijke et al., 2003).

In contrast, Heckman et al. (2003) concluded that the level of education and work experience do not contribute to an increase in salaries. Mincer's model no longer provides reliable estimates of educational gains and is not a valid guide for evaluating educational policy. A more general dynamic analysis of the earnings function is required, which takes into account tuition fees, taxes, nonlinearity in learning, inseparability of experience from learning, and uncertainty (Heckman et al., 2003). Sobolev, Soboleva and Chekmarev also believe that qualification, experience,

education, and competencies are not related to the employees' pay level in the Russian economy, which reduces the motivation for productive work (Sobolev and Soboleva, 2014; Sobolev, 2017; Chekmarev, 2015).

Rutkowski (1996) and Disney and Gosling (1998) studied the relationship between the theory of human capital and salaries in the public and private sectors. According to the analysis of data from a sample survey of employers in Poland, income inequality and allowances for education and skills are higher in the private sector than in the public sector (Rutkowski, 1996). In the public sector, middle-skilled workers are best employed, while those with no qualifications or with academic degrees should work in the private sector as their salaries will be higher there (Disney and Gosling, 1998). Filmer and Lindauer, who studied the civil service in Indonesia, reached the same conclusion. Their results showed that Indonesian civil servants with secondary or less education earn more than their counterparts in the private sector, and civil servants with higher secondary education earn less than in the private sector (Filmer and Lindauer, 2001). Later, Lucifora and Meurs determined that in all countries the public sector pays low-skilled workers more than the private sector, while the opposite is true for high-skilled workers. In countries where the formation of salaries is well regulated (for example, in France and Italy), the gap in salaries in the public sector is smaller (Lucifora and Meurs, 2004).

As for civil servants, the civil servants' pay in Russian federal executive bodies depends on work experience in the civil service (Parfentieva, 2014). Alonso and Lewis performed multiple regression and logit analyses of responses from 35,000 public servants and found that public servants who value the distinctive nature of their civil service activities prefer to be rewarded according to their ability, knowledge and skills and based on the performance efficiency (Alonso and Lewis, 2001). Huyen and Phan, researching Vietnamese public service, argue that paying civil servants appropriately is an investment in human resource development, motivating them to work harder, and contributing to political system building and anti-corruption activities (Huyen and Phan, 2019).

In order to substantiate the part of the hypothesis revealing the relationship between qualification and pay, some researchers use a system-logical analysis. Mincer established the dependence of the pay level on investment in human capital (level of education and work experience) (Mincer, 1958; Mincer, 1974). Becker concluded that employees with a higher level of professionalism and qualifications receive more income; however, some investments in human capital do not affect income (Becker, 1962; Becker, 1964; Becker, 2003).

Skill-based pay motivates employees to acquire the necessary skills (Shareef, 1994). Milanowski researched the teachers' pay based on their knowledge and skills and noted that their payment system contributes to the achievement of educational goals and increases students' performance (Milanowski, 2002). However, employees' pay, based on their knowledge, skills and competencies, presents many difficulties,

although it is gaining popularity (Ledford, 1995). Pay depending on professional qualities is effective only if it is consistent with the organisation's personnel management system (Heneman and Ledford, 1998).

With regard to civil servants in Russia, according to the results of an expert survey of specialists from the Civil Service Personnel Department of the Federation Council, the civil servants' pay, according to the respondents, depends primarily on the subjective attitude of the head (70%), then on the level of qualifications (50%), volume of work performed (40%), and compliance with disciplinary requirements (20%) (Rogozhkin, 2012). At the same time Panova believes that the civil servants' pay in Russia depends on the civil service position and work experience, and not on the civil servants' qualification and professionalism (Panova, 2015).

As for civil servants in other countries, in Estonia, for example, the civil servants' pay doesn't depend on their work experience. According to the 2012 civil service reform in Estonia, seniority pay was completely abolished (Pesti and Randma-Liiv, 2018). The civil servants' pay in Slovakia, on the contrary, depends on work experience according to the 2009 Civil Service act. The pay is calculated by multiplying the salary class level by the coefficient for the length of service (Nemec, 2018). The salary for service in office is 1% cumulative for each year of service (Staroňová, 2017). Also, Kozjek and Franca argue that in Slovenia, for instance, highly skilled and well-educated civil servants don't receive high salaries. The authors think that one of the legal limitations in the field of civil servant talent management in this country is related to limited reward opportunities, and consequently, the promotion of civil servants. The applicable system is more obstructive than encouraging to the options of retaining talented employees (Kozjek and Franca, 2020).

2.2. Relationship of working conditions measures with the civil servants' pay

Many researchers study the relationship of pay with work location, living conditions, climate, environmental conditions, working hours, risks at work and some benefits. Most researchers use regression analysis to substantiate the part of the hypothesis revealing the relationship between working conditions and pay.

Rosen and Thaler concluded that employees need to be offered higher salaries to compensate for risky working conditions (Thaler and Rosen, 1976). Berger researched compensation for differences in the development of Russian cities in the labour and housing markets. The results of the construction of the regression model revealed compensating differences in salaries. Workers are compensated for differences in climate, environmental conditions, and crime rates. These compensating differences exist even after taking into account the "regional coefficients" in salaries set by the Russian government to compensate public sector workers for living in regions with unfavourable climatic and environmental conditions (Berger et al., 2008). Jäkel's findings suggest that employees' wages depend on regions and on federal or municipal

employment as well. For example, wages are higher in industrialized regions, and a municipal employee in the Stavropol region earns less than a regionally employed federal official (Jäkel, 2019).

Oshchepkov also investigated the interregional differentiation of salaries, namely the influence of the economic structure and differences in living conditions on employees' salaries in Russia. According to the results of his analysis, workers receive higher salaries in regions with high prices and unfavourable living conditions (for example, a cold climate, a high degree of environmental pollution) (Gimpelson and Kapelyushnikov, 2008; Oshchepkov, 2020).

Assessing the impact of harmful conditions on salaries in Russia, Abanokova also found that there are bonuses for harmful conditions, but that there are no compensations for risks at work for men. High salaries in organisations with harmful working conditions attract workers to workplaces associated with health risks. Also, the results of the regression analysis confirmed the existence of bonuses for unfavourable living conditions, for example, in the northern regions, and sectoral rents for workers employed in traumatic industries, such as construction and metallurgy (Abanokova, 2011).

To substantiate the hypothesis that reveals the relationship between working conditions and salaries, some researchers used a system-logical analysis. Rosen noted the need to equalise differences in the characteristics of work with the help of prices. Differences in workers' salaries arise from work characteristics, such as unfavourable working conditions (for example, work with a risk to life and health), differences in climate, crime, and pollution levels, special working hours (for example, shift work or inflexible work schedule), and components of salaries (vacation, pensions, benefits). According to Rosen, the employer 'buys' employee's characteristics, and the employee 'buys' job characteristics. Bonuses at workplaces with unfavourable working conditions compensate for risky conditions and retain workers (Rosen 1987).

Roshchin and Razumova determined that the hedonistic theory of wages (the theory of compensating differences) is based on the assumption that a worker seeks to maximize their utility by choosing a job. At the same salary level, the employee will prefer to work for an employer where working conditions and other characteristics of the work will be better from the employee's point of view. An employer whose job characteristics (working conditions, location of work, social benefits) are worse is forced to compensate by introducing additional payments to salaries (Roshchin and Razumova, 2000). Pesti and Randma-Liiv also think that the less job security there is, the more it should be compensated by other rewards. It is claimed that substantially diminished rewards may contribute to temporary civil servants, including problems with recruiting new officials and a further increase in their turnover (Pesti and Randma-Liiv, 2018).

Thus, different researchers investigate various qualification and professionalism measures and working conditions measures affecting and not affecting the pay level

(Table 1). The influence of these factors can be both positive and negative on the pay level. The theory of human capital establishes the dependence of salaries on education, work experience, knowledge, skills, and competencies, and the theory of compensating differences on the region of work, climate, environment, and associated risks.

Table 1:

Qualification and professionalism measures and working conditions measures affecting and not affecting the pay level investigated by the researchers

Measures affecting and not affecting the pay level	Researchers
Qualification and professionalism measures	
Work experience	Becker (1993), Becker (2003), Chekmarev (2015), Dekina (2016), Heckman et al. (2003), Huyen and Phan (2019), Mincer (1974), Mincer and Polachek (1974), Nemec (2018), Panova (2015), Parfentieva (2014), Pesti and Randma-Liiv (2018), Randma-Liiv, Rogozhkin (2012), Sobolev (2017), Sobolev and Soboleva (2014), Staroňová (2017)
Level of education	Becker (1962), Becker (1964), Becker (1993), Becker (2003), Becker and Chiswick (1966), Chekmarev (2015), Dekina (2016), Disney and Gosling (1998), Filmer and Lindauer (2001), Heckman et al. (2003), Huyen and Phan (2019), Kozjek and Franca (2020), Mincer (1958), Mincer (1962), Mincer (1974), Panova (2015), Rogozhkin (2012), Rutkowski (1996), Sobolev (2017), Sobolev and Soboleva (2014)
Skills, knowledge, competencies, professional qualities	Alonso and Lewis (2001); Becker (1962), Becker (1964), Becker (1993), Becker (2003), Becker and Chiswick (1966), Chekmarev (2015), Dekina (2016), Disney and Gosling (1998), Heijke et al. (2003), Heneman and Ledford (1998), Huyen and Phan (2019), Kozjek and Franca (2020), Ledford (1995), Lucifora and Meurs (2004), Milanowski (2002), Mincer (1958), Mincer (1962), Mincer (1974), Mincer and Polachek (1974), Panova (2015), Rogozhkin (2012), Rutkowski (1996), Shareef (1994), Sobolev (2017), Sobolev and Soboleva (2014)
Working conditions measures	
Work location, living conditions, climate, environmental conditions	Abanokova (2011); Berger et al. (2008); Gimpelson and Kapelyushnikov (2008); Jäkel (2019); Oshchepkov (2020); Rosen (1987); Roshchin and Razumova (2000)
Working hours	Rosen (1987)
Risks at work	Abanokova (2011); Rosen (1987); Thaler and Rosen (1976)
Benefits, job security	Pesti and Randma-Liiv (2018); Rosen (1986); Roshchin and Razumova (2000)

Source: Author's own compilation based on the analysed literature.

According to most researchers, there is a stable relationship between the pay level and qualification, as well as between salaries and working conditions. The higher the professionalism and the more difficult the working conditions, the higher the salary. Most authors analyse pay measures in the labour market, research of factors in the field of civil service is not enough. This paper is distinguished from other articles by the number of pay measures studied.

3. Research methodology

A review of sources on the research topic shows that the authors mainly use quantitative methods, especially regression analysis, to substantiate the relationship between salaries and different measures. In this regard, in order to test hypotheses empirically and to identify measures affecting the civil servant pay levels the author uses regression analysis which is performed in the STATA statistical software program.

The article analyses statistical data from a sociological survey of civil servants conducted by the Russian Public Opinion Research Center (VTsIOM) in 2017. 2,479 civil servants were surveyed in various federal and regional authorities located in 77 regions of Russia. In Russia there is a difference in an assessment of civil servants' pay differentiation. Measures of the civil servant pay levels are different in comparison with the average pay in the economy and with the civil servants' expected pay.

For an assessment of civil servants' pay differentiation in comparison with the average pay in the economy, the variable from the VTsIOM survey «the civil servant average monthly pay level (pay including all allowances, bonuses, and additional payments) for the last year (in thousands of rubles per month)» is compared with the average monthly nominal accrued salary of employees for a full range of organisations in the Russian economy as a whole. The average monthly salary of employees in the Russian economy in 2016 was 36,709 rubles. If the average monthly salary of a surveyed civil servant is higher than the average monthly salary of employees in the Russian economy, the value of the dependent variable «pay level differentiation 1» (in comparison with the average pay in the economy) (y1) is 1, if it is lower - 0.

For an assessment of civil servants' pay differentiation in comparison with the civil servants' expected pay, the variable from the VTsIOM survey «the civil servant average monthly pay level (pay including all allowances, bonuses and additional payments) for the last year (in thousands of rubles per month)» is compared with another variable from the survey – «a fair pay level for the civil servant who replaces you». The average monthly pay level of civil servants is 75% (the third quartile) of the fair average pay for civil servants. If the average monthly pay level of a surveyed civil servant is more than 75% of the average fair pay level of a surveyed civil servant, the value of the dependent variable «pay level differentiation 2» (in comparison with the civil servants' expected pay) (y2) is 1, if it is 75% and below - 0.

The sample of the study consists of civil servants who provided data on the average monthly pay level. In model 1 of the study (civil servants' pay differentiation in comparison with the average pay in the economy) the sample consists of 1,907 surveyed civil servants, in model 2 (civil servants' pay differentiation in comparison with the civil servants' expected pay) - of 1,735 civil servants. In model 2, the sample size is smaller as some respondents found it difficult to indicate a fair pay level. The limitations of this study are the lack of sufficient diversity in the answers of the

respondents, in particular, due to the unwillingness of the respondents to answer the questions, and the analysis of data spanning one year only.

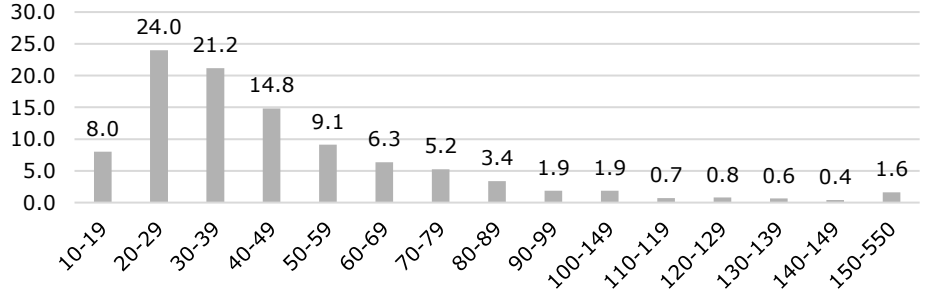
Men make up 32% of all interviewed civil servants, and women - 68%, which generally correlates with the data of the Federal State Statistics Service on gender and age composition of civil servants in general. The age of the respondents varies from 19 to 69 years, the average age is 38 years. The work experience in the civil service of the interviewed civil servants ranges from 0 to 42 years, the average work experience in the civil service is 8 years. The average work experience in government bodies, in which civil servants worked at the time of the survey is 6 years, and in their current positions - 4 years.

Most of the surveyed civil servants (77%) have higher education, as this is the main requirement for entering the civil service. 17.6% also have a second higher education or completed postgraduate studies. 4.3% of all respondents have an academic degree or title, 1.2% have no higher education. The surveyed civil servants work in government bodies in 76 regions of Russia. The largest portion of the civil servants (18.8%) are employed in government bodies in Moscow, 13% of whom are employed in central offices of federal executive bodies.

According to the results of the VTsIOM survey, the average monthly pay level of the surveyed civil servants, in 2016, amounted to 46,000 rubles (taking into account all allowances, bonuses, and additional payments). The minimum level of pay received by the respondents was 10,000 rubles, and the maximum was 550,000 rubles. Most of the surveyed civil servants (24%) received a salary of 20-29,000 rubles. The salary of more than half of the respondents (60%) ranges from 20-49,000 rubles (Figure 2).

Figure 2:

The share of civil servants by the average monthly pay level (in thousand rubles) for 2016, %



Source: Author's own compilation based on the survey of civil servants conducted by VTsIOM in 2017.

In accordance with the literature and hypothesis, 19 independent variables are selected as measures that could potentially be interrelated with civil servants' pay differentiation in comparison with the average pay in the economy and the civil servants' expected pay (Table 2). The variables are divided into 2 groups: qualification and professionalism measures and working conditions measures. All variables are binary: take on the values 1 («yes») or 0 («no»).

Table 2:

Independent variables that are qualification and professionalism measures and working conditions measures

Variable	Definition
Qualification and professionalism measures	
x_1	Long-term work experience in the civil service (more than 10 years)
x_2	Second, third higher education, postgraduate studies
x_3	Academic degree, title
x_4	Previous place of work - state or municipal service
x_5	Self-employment without recommendations and suggestions
x_6	Opportunity for gaining a unique experience at work
x_7	Ability to realise creativity at work
x_8	Use of one or several foreign languages at work
x_9	Participation within the last 3 years in professional training, retraining and (or) professional development programmes
x_{10}	Participation in project work in addition to performing the functional duties fixed in the job regulations
x_{11}	Work mainly in information systems and electronic document management systems in comparison with paper document flow
Working conditions measures	
x_{12}	Convenient location and good transport accessibility of work
x_{13}	Satisfying work schedule
x_{14}	Well-equipped workplace
x_{15}	Use of benefits and state guarantees for the last 3 years
x_{16}	Lack of delays at work for the performance of official duties
x_{17}	Lack of work at weekends to perform official duties
x_{18}	Clear definition of the conditions for career growth
x_{19}	Assessment system based on key performance indicators in a government body

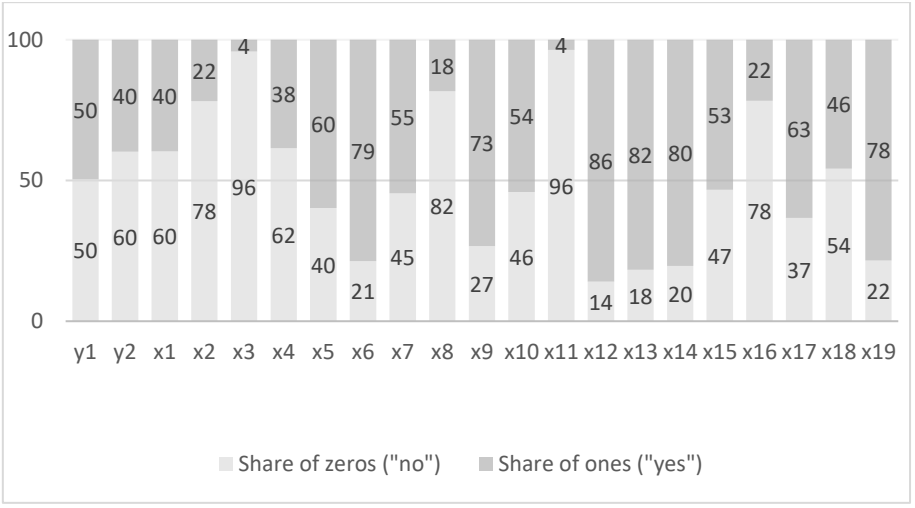
Source: Author's own compilation based on the survey of civil servants conducted by VTsIOM in 2017.

The values of the dependent binary variables in both models are normally distributed. The dependent variable «pay level differentiation 1» (in comparison with the average pay in the economy) (y1) has a ratio of zeros and ones of 50.45% to 49.55%, and the dependent variable «pay level differentiation 2» (in comparison with the civil servants' expected pay) (y2) has a ratio of 60.23% and 39.77%, respectively (Figure 3). The number of surveyed civil servants whose salaries are higher than the workers'

salaries in the Russian economy is about the same as the number of those, whose salaries are lower than the average. The number of respondents whose salaries are less than 75% of the average fair salaries of the surveyed civil servants is slightly higher than the number of those whose salaries are more than 75% of the fair level. However, the Shapiro-Wilk test shows that 10 out of 19 independent variables (for example, a second higher education, an academic degree, a convenient location of work, etc.) are distributed abnormally due to the specifics of the data under study.

Figure 3:

Descriptive statistics of dependent and independent variables (shares of zeros and ones)



Source: Author's own compilation based on the survey of civil servants conducted by VTsIOM in 2017.

4. Regression models

To analyse measures affecting civil servants' pay differentiation in comparison with the average pay in the economy and the civil servants' expected pay, it is necessary to construct binary logistic regressions, since the dependent variables in both models are binary. Both regression models include all 19 independent variables. In the first regression model, civil servants' pay differentiation is assessed in comparison with the average pay in the economy and in the second one, in comparison with the civil servants' expected pay. The number of observations in the first regression model is

1,239 and in the second one 1,152.

Based on the results of the first regression model (civil servants' pay differentiation in comparison with the average pay in the economy), it can be concluded that long-term work experience in the civil service (more than 10 years) (x1), self-employment without recommendations and suggestions (x5), use of one or several foreign languages at work (x8), participation in professional training, retraining and (or) professional development programmes (x9), participation in project work (x10), use of benefits and state guarantees (x15), lack of delays at work (x16), and the availability of an assessment system based on key performance indicators in a government body (x19) are statistically significant. The rest of the variables associated with the number of higher educations, postgraduate studies, previous places of work, opportunity for gaining a unique experience at work, ability to realise creativity at work, work in information systems and electronic document management systems, a convenient location of work, satisfying work schedule, a well-equipped workplace, lack of work at weekends, and a clear definition of the conditions for career growth turned out to be insignificant (Table 3).

Table 3:

Odds ratios and P-values in regression models

Variable	Regression model 1		Regression model 2	
	Odds Ratio	P-value	Odds Ratio	P-value
Qualification and professionalism measures				
x_1	2.098	<0.001	0.999	0.991
x_2	1.327	0.078	0.948	0.741
x_3	2.166	0.050	1.066	0.855
x_4	1.244	0.102	0.991	0.946
x_5	0.581	<0.001	0.870	0.283
x_6	1.256	0.185	1.108	0.554
x_7	1.234	0.147	1.217	0.175
x_8	2.154	<0.001	1.194	0.271
x_9	1.530	0.004	0.937	0.654
x_{10}	1.440	0.004	1.015	0.908
x_{11}	1.102	0.750	1.365	0.308
Working conditions measures				
x_{12}	1.021	0.913	0.983	0.930
x_{13}	0.735	0.082	0.987	0.939
x_{14}	1.262	0.195	1.066	0.725
x_{15}	1.711	<0.001	1.326	0.028
x_{16}	0.709	0.038	0.996	0.982
x_{17}	1.181	0.249	1.418	0.014
x_{18}	1.007	0.958	1.618	<0.001
x_{19}	0.647	0.005	1.302	0.092

Source: Author's own compilation based on the survey of civil servants conducted by VTsIOM in 2017.

In the second regression model (civil servants' pay differentiation in comparison with the civil servants' expected pay), the use of benefits and state guarantees (x15), lack of work at weekends (x17), and a clear definition of the conditions for career growth (x18) are significant. The rest of the variables turned out to be insignificant according to the results of the regression analysis (Table 3).

The odds ratio in Table 3 represents the proportion of two probabilities: probability of receiving a high pay level and probability of receiving a low pay level. For example, in the first regression models the use of one or several foreign languages at work and having a long-term work experience in the civil service (more than 10 years) put at 2 times greater odds of receiving the pay level higher than the average pay in the economy. At the same time if civil servants are self-employed in the civil service without any recommendations and suggestions, the odds of receiving the pay level higher than the average pay in the economy decrease.

Both regression models were tested for potential overfitting. In order to evaluate the performance of models the author uses classification accuracy and area under the ROC curve. The models correctly classify 65% and 64% of observations, respectively. The quality of the binary classification, estimated by the ROC curve, suggests that the ratio of correctly and incorrectly predicted values by the model is close to the optimal (Table 4). In both regression models, there is a non-normal distribution of residues. The test model for multicollinearity does not reveal the correlation between independent variables that confirms the correctness and feasibility of their choice.

Table 4:

Evaluation of the performance of regression models

	Regression model 1	Regression model 2
Classification accuracy	64.49%	63.45%
Area under the ROC curve	71.60%	62.31%

Source: Author's own compilation based on the survey of civil servants conducted by VTsIOM in 2017.

5. Regression results and discussion

Assessing the civil servants' pay, in comparison with the average pay in the economy, the interviewed civil servant pay levels are influenced by both qualification and professionalism measures and working conditions measures. Among qualification and professionalism measures, civil servants' salaries are positively influenced by long-term work experience in the civil service, the use of foreign languages at their work, participation in professional training, retraining and (or) advanced training

programmes, and in project work. The use of foreign languages at work and a long-term work experience in the civil service have the greatest influence on the surveyed civil servant pay levels. If civil servants have more than 10 years of work experience in the civil service and use at least one foreign language at work, they receive a higher salary than those who have less years of work experience in the civil service and do not use any foreign languages at their work. Self-employment without recommendations has a negative effect on the civil servants' pay, owing to the fact that when they are employed through acquaintances, civil servants' salaries are higher. Among working conditions measures, the use of benefits and state guarantees positively affects the civil servants' pay, while the assessment system based on key performance indicators in a government body and the lack of delays at work negatively affect civil servants' salaries. It is worth noting that the use of foreign languages at work and a long-term work experience in the civil service have a much stronger effect on the pay level than overwork and the received benefits (Table 5).

Table 5:

Measures affecting civil servants' pay differentiation

Civil servants' pay differentiation (in comparison with the average pay in the economy)	**Civil servants' pay differentiation (in comparison with the civil servants' expected pay)**
Positive relationship (from strong to weak)	
Use of one or several foreign languages at work (x_8)	Clear definition of the conditions for career growth (x_{18})
Long-term work experience in the civil service (more than 10 years) (x_1)	Lack of work at weekends to perform official duties (x_{17})
Use of benefits and state guarantees for the last 3 years (x_{15})	Use of benefits and state guarantees for the last 3 years (x_{15})
Participation within the last 3 years in professional training, retraining and (or) professional development programmes (x_9)	
Participation in project work in addition to performing the functional duties fixed in the job regulations (x_{10})	
Negative relationship (from strong to weak)	
Self-employment without recommendations and suggestions (x_5)	
Assessment system based on key performance indicators in a government body (x_{19})	
Lack of delays at work for the performance of official duties (x_{16})	

Source: Author's own compilation based on the survey of civil servants conducted by VTsIOM in 2017.

Assessing the civil servants' pay in comparison with the civil servants' expected pay, only working conditions measures positively affect the surveyed civil servants' pay: the use of benefits and state guarantees, the lack of work at weekends, and a clear definition of the conditions for career growth. It is important to note that despite the fact that in reality both qualification and working conditions measures influence the civil servants' pay, civil servants do not subjectively perceive the influence of their qualification and professionalism on salaries. In their opinion, only work at weekends, the availability of benefits and state guarantees, and a clear definition of the conditions for career growth affect the pay level (Table 5).

Several qualification and professionalism measures and working conditions measures are found to be insignificant in both regression models: the number of higher educations, an academic degree, relationship of the previous place of work with the civil service, opportunity for gaining a unique experience and realisation of creativity, work in information systems and electronic document management systems, work location, and the workplace equipment. The use of benefits and state guarantees turned out to be significant in both regression models, and civil servants feel less significance of this measure on their salaries.

Thus, the first hypothesis, that civil servants' pay differentiation in comparison with the average pay in the economy is mostly determined by qualification and professionalism measures, is fully confirmed. The second hypothesis, that civil servants' pay differentiation in comparison with the civil servants' expected pay is mostly determined by working conditions measures, is partially confirmed since qualification and professionalism turned out to be insignificant in the second regression model.

As for recommendations based on the results of regression analysis, it can be noted that it is necessary to strengthen the link between civil servants' pay and their qualifications and professionalism. For example, it is proposed to establish higher requirements for foreign languages (e.g., English) at the highest positions of the civil service. Also, it would be useful to change an interval scale of allowances for work experience in the civil service into a differentiated scale for each year, to link civil servants' pay with programmes of additional professional education and to introduce bonuses for project activities included in additional payments to civil servants. Assessing the importance of qualification for the pay level, civil servants will try to improve professionalism and competences, which will lead to more efficient professional activities of civil servants and to the selection of more qualified personnel for the civil service.

6. Conclusion

The civil servants' pay system needs to be improved in Russia. Although the civil servant pay levels are not very high, especially in low job positions, the civil service remains attractive. In general, qualification and professionalism measures have more influence on the civil servant pay levels than civil servants feel themselves. Instead of qualification and professionalism, working conditions are more significant for the civil servants. Thus, theories explaining the impact of qualification and professionalism measures (the theory of human capital) and working conditions measures (the theory of compensating differences) on pay are partly applicable in Russia.

The civil servants do not believe that their salaries depend on long-term work experience in the civil service, knowledge of languages, participation in additional professional education programmes, and in project work. According to civil servants' points of view, only benefits, state guarantees, conditions for career growth, and work at weekends affect their pay levels. The civil servants' pay is not influenced by such measures as the number of higher educations, an academic degree, relationship of the previous place of work with the civil service, possibility of obtaining unique experience and realizing creativity, work in information systems, the location of work and the workplace equipment.

The first hypothesis of the study that civil servants' pay differentiation, in comparison with the average pay in the economy, is mostly determined by qualification and professionalism measures is fully confirmed. The second hypothesis of the study, that civil servants' pay differentiation in comparison with the civil servants' expected pay, is mostly determined by working conditions measures is partly confirmed.

As for recommendations for improving the civil servants' pay system in Russia, it is necessary to introduce bonuses for project activities and a differentiated scale of allowances linked to work experience in the civil service. Also, it is important to increase the civil servants' pay after each programme of additional professional education is completed.

Civil servants' pay differentiation should be smoother and more explained by qualification and professionalism than working conditions and overtime work. The Russian civil servants' pay system crucially depends on changes aimed to increase the roles of qualification and professionalism.

All in all, this paper contributes to competency-oriented pay theories and to the knowledge and better understanding of measures affecting the civil servant pay levels in Russia. The results of the research can be used for further study of civil servants' pay and motivation, their qualification and working conditions.

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