

NATIONAL RESEARCH UNIVERSITY HIGHER SCHOOL OF ECONOMICS

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BASIC RESEARCH PROGRAM

WORKING PAPERS

SERIES: ECONOMICS WP BRP 104/EC/2015

This Working Paper is an output of a research project implemented at the National Research University Higher School of Economics (HSE). Any opinions or claims contained in this Working Paper do not necessarily reflect the views of HSE

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ESTIMATING THE PUBLIC-PRIVATE WAGE GAP IN RUSSIA: WHAT DOES QUANTILE REGRESSION TELL US?⁴

This paper explores the public-private wage gap in the Russian economy along the whole wage distribution. Using the RLM-HSE data set, it examines how gaps at various points of the distribution changed from 2000-2014 and presents decompositions of the gaps into components explained by differences in characteristics and differences in returns. The results suggest that the gap persists over time and varies along the wage distribution. During the 2000s low-skilled public sector workers had smaller pay gaps than higher-skilled workers had. Governmental policy interventions and the economic crisis of 2008-2009 contributed to the narrowing of the gap and its partial equalization along the distribution. A new set of policy changes associated with the May 2012 Presidential Decrees strengthened these tendencies but did not eliminate the gaps.

JEL Classification: J31, J45.

Keywords: public sector, wage, public-private wage gap, quantile regression, RLMS-HSE, Russia.

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⁴ The authors acknowledge support the HSE Basic Research Program. We would like to thank Irina Denisova, Rostislav

Kapeliushnikov, Sergey Roshchin, and Tatiana Zhuravleva for helpful comments and suggestions. All remaining errors are ours.

1. Introduction

High quality public services are vital for any modern society but become increasingly costly. The largest fraction of this cost is composed of labor costs. Wage setting in the public sector has strong policy consequences. Under- or overpayment of public sector employees (compared to their private sector counterparts) is likely to affect performance of the labor market negatively. Wage premiums in the public sector tend to crowd out private jobs and reduce overall employment (Algan et al., 2002). Additionally, large public sector wage bills contribute to fiscal imbalances. Conversely, maintaining negative wage gaps stimulates adverse selection and drags down wages in the entire economy thereby inflating ineffective employment and promoting corruption (Gorodnichenko and Sabirianova-Peter, 2007).

The law of one wage assumes that private and public wages should be equal, if individual and job characteristics are properly controlled for (Hirsch, 2008). The institutional wage setting mechanisms in developed countries are usually designed with the objective to maintain the intersectoral pay balance (Lamo et al., 2012). Workers are expected to be paid according to their human capital irrespective of what sector or industry they are employed. However, a number of empirical studies document a positive wage premium that public sector workers may earn relative to their private sector counterparts, other things being equal (Ehrenberg and Schwarz, 1986; Gregory and Borland, 1999; Giordano et al., 2011). There are multiple reasons for that. The public sector is not constrained by profit maximization and the government may pursue political objectives as priorities. Higher unionization in the public sector as well as some political clout around many public sector activities may strengthen its bargaining power and generate sources of rent. Additionally, governments often seek to be good employers for less skilled and are ready to pay higher wages to this group of workers.

This paper focuses on the public-private wage gap in the Russian economy. We explore the gap along the whole wage distribution (going beyond traditional analysis at the mean) and examine how gaps at various points of the distribution change over time. Then we decompose the gaps into components explained by differences in the composition of the labor force between the sectors (the effect of characteristics) and by the differences in labor market values of these characteristics (the effect of returns). This analysis helps better understand the nature of wage disparities and the impact of policies pursued over the period under consideration. This type of analysis is novel for Russia.

The paper contributes to the existing literature in a number of ways. Most of the publicprivate wage comparisons in the transition countries have explored the gap at the mean of the wage distribution. Studies on other countries provide evidence that the gap varies significantly over the distribution, and the public sector distribution is usually more compressed. The mean estimates can be misleading in this situation. In this paper, we compare the shapes of the distributions and estimate the gaps along the distribution using quantile regression and decompositions techniques. Furthermore, the paper utilizes data from the Russia Longitudinal Monitoring Survey (RLMS-HSE) covering a more recent period than the previous studies did – from 2000 to 2014.

The rest of the paper is structured as follows. In the next section, we briefly describe the main trends in employment and earnings and the institutional framework of wage setting in the public sector. Section 3 gives an overview of previous empirical research of public-wage differentials using quantile regressions. Section 4 presents the empirical methodology, data description and main definitions. In Section 5, we discuss the main results and Section 6 outlines some limitations of our findings. Section 7 concludes.

2. The Public Sector in Russia

2.1. Main Trends

As the point of departure, we present some aggregate trends in Russian public employment and wages (based on the aggregate data series from Rosstat). The public sector is defined here (in this paragraph) as the sum of three sections according to the ISIC (Rev.3): L (Public Administration and Defense), M (Health and Social Work), and N (Education). Though some employees in sectors M and N may perform market services, their percentage is relatively small (about 10 percent of incorporated employment in those sectors in 2013 and less in the previous years⁵) and confined mostly to a few large cities. Figure 1 describes the evolution of the public sector employment from 2000 to 2014. Over the whole period, public employment increased by five percent but this was attributable almost entirely to the expansion of Public Administration. Private sector employment expanded at the same rate, so that the share of public employment stayed unchanged and hovered at about 21 percent. The Russian public sector appears to be a large employer and, thus, should be able to affect wages in the rest of the economy.

Figure 2 shows the evolution of the average monthly wage in the public sector relative to the average monthly wage in the rest of economy (defined as Total Economy minus (L+M+N)).

⁵ The authors' estimates based on the Rosstat data

The gap between the sectors is large, but it has been narrowing since the early 2000s. Over the studied period, the wage of an average public sector worker increased from 70-75 percent to 80-85 percent of the wage of an average worker outside the public sector. Comparison of wage ratios within the public sector shows substantial heterogeneity. The raw wage gap is strongly negative for Education and Health (20-40 percent below the average for the rest of economy) but strongly positive for Public Administration (20-30 percent above the average for the rest of economy).

2.2. Institutional background

The public sector is not exposed to profit maximization but is, instead, subject to political constraints (for international surveys and theory see: Ehrenberg and Schwarz, 1986; Gregory and Borland, 1999; Disney, 2007; Giordano et al., 2011). On the contrary, private sector wages are set by market forces. The sign and magnitude of the public-private wage gap depends on how governmental agencies receive market-based wage signals and transform them into wages for public sector workers. This transmission is largely shaped by wage setting institutions.

In most European countries public sector wages are set within the framework of national or local wage bargaining. Some countries (UK, Ireland) can use alternative wage setting procedures based on wage comparisons. Such an approach "imputes" prevailing wage to public sector workers and constrains bureaucrats in wage manipulations, leaving them to regulate the quantity of employment within given budget constraints (Elliot et al., 1999). In any case, market determined wage signals are transmitted to the non-market sector.

In Russia (as well as in other CIS countries), the wage-setting framework in the public sector is completely different. It does not account *ex ante* for relative wages as they emerge in the competitive labor market. Until 2008, all public sector workers were entitled to labor compensation according to their grade in the so-called Unified Tariff Scale (UTS). The UTS grade defined the minimal mandatory level of pay and the ladder that was supposed to account for education level, qualification and experience of an employee. The federal authorities could regulate public sector wages by fixing statutory minimum wage and shifting the UTS pay grades.

In 2008, the Government announced a transition from the UTS-based wage-setting to the so called New Pay System (NPS). The latter embraced all public sector workers except public servants working in Public Administration. This system was expected to make wage-setting more flexible and less centralized (compared to the UTS). However, it did not introduce any mechanism for cross-sector comparisons and setting the prevailing market wage.

One of the salient and universal features of the Russian labor market is the two-tier structure of wages when the latter consists of two components. The first one is fixed and rigid, while the other is flexible and largely performance-based (OECD, 2011; Gimpelson and Kapeliushnikov, 2013). The second part contains various bonuses, premiums and other pay supplements not rigidly fixed in labor contracts. On average (in both public and private sectors), the variable part comprises about 35-40 percent of the total wage bill⁶. Governmental regulations introduce the basic (guarantied) component of the public sector wage, while the further upward adjustment in particular establishments emerges spontaneously as a response to market forces and is contingent upon regional and local fiscal capacities. By design, neither the UTS nor the NPS introduced later accounted explicitly for regional heterogeneity when setting the fixed part. In fact, the federal government is constrained by the fiscal position of the least-developed region when making its pay-related decisions. This constraint drives down (in the relative terms) the basic wage of public sector workers in other (better-off) regions below competitive wages in regional labor markets. The more developed a region is, the higher the current private sector wages are and the stronger the upward pressure on wages in the budgetary sector can be. This pressure on the public sector pushes up the wages in this sector via additional bonuses and other pay supplements if and to the extent regional fiscal position allows.

The size of pay supplements reflects regional/local fiscal resources, as well as the bargaining power of education/healthcare administrators and sector trade unions. Regional bureaucrats "share" budgetary revenues with teachers and doctors when the regional fiscal position is good and workers' voices are loud enough. On the contrary, they try to keep wages close to the minimal bound when revenues are scarce and the voice is weak. This logic predicts that public sector workers in economically advanced regions are likely to have higher nominal wages than workers in depressed regions earn. The irony is that the public-private wage gaps will be larger in more developed regions as well because the gap between the grade-based pay and the competitive private sector wage widens and accommodating for it becomes more difficult (Gimpelson and Lukianova, 2009).

The new phase of the public sector wage setting began in 2012 with the Presidential Decree on wages in the budgetary sector (Decree #597 of May 7, 2012). This Decree from President Putin fixed wage targets for major occupational groups in the public sector (doctors, teachers, academic researchers, associate professionals in education, healthcare and science sectors, and some junior staff). Other occupations (mostly low skilled and supporting personnel) were neglected. The targets varied by occupational groups and were based on percentages of the

⁶ The authors' estimates based on the Rosstat data

regional average wage. Apart from increasing salaries in Health and Education, the May decrees stated significant pay increases for senior government officials, police, the military, state security bodies, presidential administration, etc. If accomplished, the pay targets assumed a sharp increase in the public sector wages. However, such wage increases automatically shift the average wage upward thus making the wage race self-perpetuating. This system began to function effectively in 2013 along with the introduction of very stringent administrative monitoring and enforcement.

3. Overview of previous findings

Under the central planning system (before the early 1990s), education and health care the main components of what is usually considered the public sector - were chronically underfunded (compared to the industrial enterprises) with negative salary implications for those employed in these sectors. At the start of the transition to a market system the change in priorities and increase in returns to skills were expected. Empirical studies for Central and Southern European countries support largely this expectation (see the survey in Lausev, 2012a). Adamchik and Bedi (2000) documented private sector wage advantages, albeit of small magnitude, for Poland in the mid-1990s. Lokshin and Jovanovic (2003) received the same results for Yugoslavia. Falaris (2004) did not find any evidence of the public-private wage gap in Bulgaria in the 2000s. The paper by Leping (2006) on Estonia reports large and negative gaps at the beginning of the transition period that eventually faded off by the early 2000s. The results in Lausev (2012a and 2012b) suggest that public sector workers experienced a significant improvement in their financial position relative to their private sector counterparts with the progress of the economic transition in Hungary and Serbia. In Hungary, the narrowing gap was related to large scale reforms of the public sector in the early 2000s specifically aimed at increasing the relative pay in this sector. Before these reforms, the country experienced a widening of the public disadvantage in spite of the progress of restructuring in other areas.

In most countries the deviations from the one wage law, if significant, benefit the public sector. Russia makes up one of few exceptions (Gorodnichenko and Sabirianova-Peter, 2007; Gimpelson and Lukyanova, 2009)⁷. Previous studies suggest that the public-private wage gap has been significant and persistent. Controlling for observable and unobservable characteristics

⁷ The finding that public sector workers receive lower wages than their counterparts in the private sector is not unique to Russia. Gorodnichenko and Sabiranova-Peter (2007) reported even larger and stable conditional wage penalties (24-32 percent) for Ukraine.

narrows the gap but leaves it looming large. Jovanovic and Lokshin (2004) estimate the gap to be 14 percent for men and 18 percent for women. They stressed that a higher fraction of state-sector workers received non-wage benefits that might partially compensate for lower pay. Gimpelson and Lukiyanova (2009) test this hypothesis using the data from the Russia Longitudinal Monitoring Survey (RLMS-HSE) for 2000-2003, but end up with very close estimates (14 percent for men and 17 percent for women) in the specification that controls for fringe benefits and sector selection. Additionally, Gimpelson and Lukiyanova (2009) estimate remarkably similar gaps from the 2003 NOBUS data and Sharunina (2013) confirms the size of the gap for the end of the decade. The gap seems to be time-persistent in spite of substantial worker mobility across sectors. This short review suggests that negative pay gaps persistent in Russia are what may disincentivize high-skilled workers to be employed in the public sector. These timepersistent gaps call for further research in the field.

Recently, increasingly more studies use quantile regressions to examine how the publicprivate wage gaps vary along the earnings distribution. Poterba and Rueben (1994) were the first to apply this method to the data on the US. They reported that the wage distributions were more compressed in the public sector. This inequality-reducing effect worked at both tails of the wage distribution as the public sector had "higher floors" and "lower ceilings". Public sector workers received a wage premium relative to the private sector employees at the lower tail of the distribution, but a small premium or even a wage penalty at the upper tail. Other studies using quantile regression produced generally similar results. Typically, they documented that the public sector advantage declined monotonically along the conditional wage distribution. These results suggest that low-skilled public sector workers are overpaid, while high-skill public sector workers are underpaid⁸. Both problems lead to inefficiencies. Females benefit more from working in the public sector. They are often found to have a premium along the entire wage distribution, while male public sector workers suffer from wage penalty in the top part of the distribution. These results hold for both poor countries (see Nilesen and Rosholm (2001) for Zambia; Hyder and Reilly (2005) for Pakistan) and developed countries (see Blackaby et al.

⁸ These results should be interpreted with caution as shown in Bargain and Melly (2008) and Siminski (2013). Wage premium across the wage distribution may be also explained by sector selection on unobserved skills. Higher wage premiums for low-skilled workers are consistent with the explanation that the public sector is able to attract better workers (on observed skills) in low pay occupations because of smaller variance of wages at any skill level. Bargain and Melly (2008) using fixed effects quantile regression reported that sector pay differentials were essentially the result of selection in France contrary to a net premium for women and some penalties for men in previous studies. Siminski (2013) derives similar conclusions for Australia applying the quasi-differenced panel data analysis. Accounting for selection also reduced the public-private wage gaps along the wage distributions in some other countries but did not eliminate them entirely. However, the results were found to depend strongly on model specification, the choice of instruments and country-specific institutional features.

(1999) and Disney and Gosling (1998) for the UK; Melly (2005b) for Germany; Cai and Liu (2011) for Australia).

Earlier papers using quantile regressions estimated single log wage equations with public sector dummies. Later studies went ahead by estimating separate quantile regressions for each sector and decomposing the wage gap at various quantiles. Recent papers follow more advanced approaches suggested by Machado and Mata (2005) and extended by Melly (2005a). Decomposing the wage gap between the public and private sectors shows that the difference is mainly attributable to differences in worker characteristics, especially in the upper part of the distribution (see Melly (2005b) for Germany; Papapetrou (2006) for Greece; Lucifora and Meurs (2006) for France, Italy and the UK). In the bottom quantiles, a significant part of the wage gap is attributed to differences in returns to characteristics.

Comparing the public sector wage gap in France, UK and Italy, Lucifora and Meurs (2006) find that the size of the gap depends on the degree of market regulation. In particular, a more regulated environment (France and Italy) led to lower public sector wage premiums; in the countries where market factors were given more freedom in pay determination (UK) the public sector premiums were larger, especially for the bottom of the wage distribution. The public-private wage gap also varies with the business cycle (Bargain and Melly, 2008). The conventional assumption in this context is that private sector labor markets are more responsive to macroeconomic conditions.

In the transition context, quantile regressions were used by Leping (2006), Gorodnichenko and Sabirianova-Peter (2007), and Lausev (2012a and 2012b). Gorodnichenko and Sabirianova-Peter (2007) demonstrated that the public sector was the least attractive employer for the most productive workers in Ukraine, as in most other countries. They found that the penalties from working in the public sector were relative small for low paid workers and large (up to 60 percent) for high-paid workers. Larger penalties for higher skilled groups were reported for the Hungarian public sector by Lausev (2012a). Leping (2006) documented similar results for the first part of the transition period in Estonia. However, by the early 2000s differences in wage gaps between the top and bottom end of the distribution decreased substantially from 53 percentage points in 1989 to 11 percentage points in 2004. Lausev (2012b) presented qualitatively similar results for Serbia. The results of these papers suggest that as a market economy matures in transition countries, one can expect the elimination of the publicprivate differential at the mean and the narrowing of the differences between the gaps at the extremes of the wage distribution. Gorodnichenko and Sabirianova-Peter (2007) is especially relevant to our study as they used the Machado and Mata quantile decomposition to assess the contribution of observable characteristics and that of returns to characteristics. They reported that the size and the distribution of the wage gap were largely determined by the differences in returns, i.e. by the differences in wage structures between the sectors. This finding contrasts with the results usually obtained for market economies (see the review above) where the gap is mainly explained by differences in characteristics especially in the upper part of the wage distribution.

4. Empirical methodology and data

Modern econometrics offers several ways to estimate the effect of the public sector affiliation at different points of the wage distribution. A large part of the literature is based on conditional quantile regression (CQR) models developed by Koenker and Bassett (1978). Within this framework, the θ^{th} quantile of the conditional wage distribution is expressed as a linear function of a worker's characteristics (x_i):

$$q_{w}^{\theta} = q_{w}^{\theta}(w_{i} \mid x_{i}) + \varepsilon_{i}^{\theta} = D_{i}\delta^{\theta} + X_{i}\beta^{\theta} + \varepsilon_{i}^{\theta}, \ \theta \in (0,1)$$

$$\tag{1}$$

where w_i is the log wage of individual *i*, D_i is a dummy variable equal to one if individual *i* works in the public sector and zero otherwise. The vector of covariates (x_i) is assumed to be orthogonal to the error term (ε_i^{θ}) .

The coefficients of Eq.(1) can be estimated solving the following minimization problem:

$$\min_{\delta^{\theta},\beta^{\theta}} \left[\sum_{i:w_i \ge x_i\beta^{\theta}} \theta \left| w_i - x_i\beta^{\theta} - D_i\delta^{\theta} \right| + \sum_{i:w_i < x_i\beta^{\theta}} (1-\theta) \left| w_i - x_i\beta^{\theta} - D_i\delta^{\theta} \right| \right].$$
(2)

The CQR coefficients can be interpreted as the return to a certain characteristic of interest at the specific conditional quantile, i.e. for a specific position in a hypothetical distribution in which all individuals have the same observed characteristics. δ^{θ} measures the impact on an individual's wage of transition from the public sector to the private sector, holding everything else unchanged. This method assumes the conditional quantile of an individual remains the same after the transition. For example, if an individual had the median position in the conditional distribution for the public sector, she/he will continue to hold the median position in the conditional distribution for the private sector after the job change. This assumption may be problematic in practice. Additionally, the single-equation model in Eq.(1) implies that the wage determination process is the same for both public and private sector workers. Another problem associated with CQRs is that the position of an individual in the conditional distribution may weakly reflect his/her position in the observed (unconditional) distribution. The top (bottom) of the conditional distribution does not correspond to the top (bottom) of its unconditional counterpart. In particular, the commonly reported monotonically declining effect of the public sector does not mean that the premium is smaller (or even negative) for the high wage earners, but for the conditional high wage earners, i.e. for those who have high wages after controlling for all covariates. For example, with respect to education it may well be that some well-paid high school dropouts may have higher conditional quantile than low-paid university graduates. Therefore, the results from conditional regression models must be interpreted with some caution.

Gaps in conditional quantiles can be decomposed into the composition effect (the part explained by differences in observable characteristics) and the wage structure effect (the unexplained part attributed to the differences in returns to characteristics). The idea resembles standard Oaxaca-Blinder decomposition (Blinder, 1973; Oaxaca, 1973). Practical solutions to this problem were proposed by Machado and Mata (2005) and later developed by Chernozhukov et al. (2013). The procedure decomposes the differences between the quantile functions of sectoral wages. The counterfactual distribution is generated by using the conditional distribution of observed wages. For that, public sector workers' characteristics are imputed to their private sector counterparts in the other part of the sample. Then the wage gap can be presented as the following:

$$q_{W^{pub}}^{\theta} - q_{W^{priv}}^{\theta} = \left[q_{\tilde{W}^{pub}}^{\theta} - q_{\tilde{W}^{ef}}^{\theta} \right] + \left[q_{\tilde{W}^{ef}}^{\theta} - q_{\tilde{W}^{priv}}^{\theta} \right] + \varepsilon^{\theta}$$

$$\tag{3}$$

where the first term is the effect of characteristics and the second term is the effect of coefficients, *cf* indexes counterfactual wages, and θ denotes the quantile.

The data used in this paper come from the 2000-2014 waves of the Russia Longitudinal Monitoring Survey (RLMS-HSE)⁹. The RLMS is a well-known panel survey of Russian households based on a national probability sample. Together with a number of standard demographic variables at the individual and household level, the RLMS contains detailed information about the labor market experience of individuals. It has been previously used by many researchers to analyze employment relationships and wage structures in the Russian labor market.

⁹ The Russian Longitudinal Monitoring survey (RLMS-HSE) has been conducted since 1992 by the National Research University Higher School of Economics and ZAO "Demoscope", together with the Carolina Population Center, University of North Carolina at Chapel Hill, and the Institute of Sociology RAS. Further for brevity we will call it RLMS.

The sample used in this paper includes full- and part-time workers. The sample is restricted to the working age group aged from 16 to the retirement age (55 for females and 60 for males). We drop observations with missing data in key variables, including age, education, occupation, earnings, and hours worked. Furthermore, we exclude the military (based on the occupational classification), individuals who report working more than 150 hours per usual week and those who report earnings more than five times larger than the 99th percentile of the distribution for each year. These restrictions leave 77,266 observations in the baseline sample. The annual sample size varies from 3,351 in 2000 to 7,284 in 2010.

Our definition of the public sector relies primarily on the industry affiliation of the employer. An individual is treated as a "public sector worker" if she is employed in a budgetary organization in education, health and social work, or public administration. The budgetary status means that the state is the sole owner of the establishment, no private ownership is present and its main activity is funded from federal, regional, or municipal budgets.¹⁰ This implies that workers employed in other state-owned enterprises (SOEs) or in mixed public-private companies are classified into the private sector (or what would be called more correctly – the commercial or market sector). In fact, most of the SOEs are profit-oriented establishments that produce market goods and provide commercial services. They are concentrated in heavily regulated industries such as natural resources, transportation, communications, the military industrial complex, and utilities. SOEs is not different than in the private sector.

The earnings variable is based on average monthly earnings over the last 12 months from the main job, taken as a net of taxes and social security contributions. To compare wages over time we deflate the nominal wage by the annual national CPI. We focus on hourly wages calculated using average monthly earnings and usual weekly hours of work multiplied by 4.2.

Table 1 shows the evolution of public employment between 2000 and 2014. The RLMS sample corresponds well with the share of the sector in the Rosstat data as it remained stable over the period at about 21 percent of total employment. The public sector provides 1 out of 3 jobs for women in Russia (compared to 1 out of 8 jobs for men). Table 2 describes the variables used in the regression analysis and decompositions. It suggests that the notable differences between workers employed in each sector can be observed with respect to education and occupational status. Public sector employees are on average better educated and predominantly

¹⁰ The authors thank Irina Denisova for sharing with us industry affiliation data for 2000-2003. She constructed this variable on the basis of confidential information on full enterprise names obtained through a special data use agreement with the RLMS-HSE. For 2004-2014 industry affiliation is taken directly from the RLMS-HSE questionnaire.

have white collar occupations. Over time the private sector has been more active in attracting a university educated workforce and expanding white collar jobs. Workers here tend to be younger, more likely to reside in urban areas and less likely to keep a second job. However, they have shorter tenures and longer working hours. As this table suggests, some of the public sector attributes (like older age and better education) can be positively correlated with wages, while most others expect negative correlation.

Workers employed in the private sector earn, on average, higher wages than the public sector employees do. From 2000-2005, an average public sector worker earned two-thirds of the private sector monthly wage, while after 2010 this proportion rose to three-quarters. Given the difference in working hours, the hourly wage gap narrowed from 27 percent in 2000 to 16 percent in 2014.

The persistent wage gap reported in earlier studies for Russia could have an effect on employment structure. The proportion of young workers declined in the public and increased in the private sector. This may indicate that low relative wages in the public sector induced young people to avoid occupations concentrated in the public sector. Workers employed in the public sector are more likely to moonlight and look for additional earning opportunities, though these shares are modest in both sectors.

In order to get a better visual understanding of the wage distribution in the sectors, we estimate the wage density using the kernel estimator and present the results in Figure 3 for 2000, 2005, 2010 and 2014. Wages in the private sector appear to have a higher mean than those in the public sector. The dispersion of wages in the private sector is larger, especially in the beginning of the period. The public sector distribution gradually shifted to the right closing the gap with the private sector. By 2014, the inter-sector differences in inequality significantly reduced or probably even vanished.

We use three decile ratios (90/10, 90/50, 50/10) for wages (expressed in natural logarithms) to compare the scale of differentiation between sectors at different points of time (Table 3). In the beginning of the period the dispersion of earnings in the private sector was larger than in the public one. Unexpectedly, however, the situation was reversed by 2014. Inequality declined faster in the private sector in both upper and lower parts of the distribution. In the public sector, inequality fell only at the bottom, while the difference between the top and the median remained unchanged. The decline of inequality proceeded smoothly in the private sector inequality-reducing changes were concentrated in the early years of the period.

Figure 4 shows the raw wage differentials (measured as log wage difference) between the public and private sectors at various percentiles. It suggests that looking just at the mean would oversimplify the real picture. The wage gap was positive for the lowest percentiles of the wage distribution but then changed the sign already at the 3-5th percentile. The public sector disadvantage generally increased while moving along the distribution towards the highest percentiles. However, by 2010 the gap became more uniform across the wage quantiles. The raw wage disadvantage declined faster for high wage earners than for low wage earners. Further changes happened by 2014. The wage gap increased in the lower part of the distribution but decreased in the upper part remaining negative across all percentiles. This suggests that better paid public sector workers could have gained from pay reforms while the lower paid have lost. Since the May 2012 Decree set wage targets for medium and high skilled public sector workers, leaving the less skilled uncovered, the observed outcome is not surprising given the budgetary scarcity Russia faced in 2014.

5. Empirical results

5.1. The Mincer-type regression and Oaxaca-Blinder decomposition

We start with estimating (by OLS) an augmented Mincerian wage equation having as regressors five education groups (incomplete secondary and less, complete secondary, vocational, technical college, university), age and age squared, gender, a dummy for marital status, eight occupation groups, seven firm-size groups (including the group for missing firm size), four tenure groups (0-1 years, 1-5 years, 5-10 years, more than 10 years) and four groups for the duration of the working week (30 hours and less, 30-40 hours, 40-50 hours, more than 50 hours). We also control for location (seven macro-regions) and settlement type (Moscow and St-Petersburg, regional capitals, towns, rural and semi-urban settlements). Working in the public sector is indicated by the sector dummy.

This specification assumes that returns to all personal and job characteristics are identical in both sectors and there is no sector selection based on unobservables. Another limitation of this regression comes from the fact that fringe benefits are omitted while the sectors differ in this respect. For example, many public sector employees have longer annual vacations and enjoy stricter and better enforced job protection. At the same time, informal workers in the private sector are often deprived of pension insurance and have limited access to all non-monetary benefits. Therefore, some public sector advantages may bias the level of the wage gap but not its changes over time given that these differences are constant. Previous studies reported that adding fringe benefits to the list of controls does not affect the gap in any important way. Moreover, we excluded the military from our sample who are the major group of early pensioners in Russia. Under these assumptions, the coefficients for the public sector dummy show the wage gap at the mean of the distribution.

The coefficients from the OLS estimation for all years are presented in Table 4 (Column 1). According to them, the public-private wage gap at the mean conditional upon observed characteristics remained negative (and statistically significant at 5 percent confidence level) over the whole period but tended to decrease gradually. It narrowed from 26-28 percent in the early 2000s to under 20 percent in the most recent years.

Clearly, the possible sources of the wage gap reduction could be different in various subperiods. Before the 2009 crisis, public sector workers benefited from commodity-driven growth; in later years, increases in relative wages of public sectors workers could be attributed to policy changes. Following the boom in the commodity markets, the Russian government squandered the sharp rise in public spending during the 2000s, with much of the windfall revenue being redistributed to increase wages in the public sector without structural reforms inside the sector. At least partially, this increase is rooted in political arguments. In countries where government accountability is weak, politicians tend to use the resource windfall revenues to stay in power, and Robinson et al. (2006) point "to the centrality of public sector employment as a tool for influencing people's voting behavior".

Using the Oaxaca-Blinder decomposition we can partition the raw (unconditional) gap into two parts of which one part is associated with inter-sector differences in characteristics and the other one is the effect of differential returns to these characteristics (Table 5, panel A and Table 6). Figure 6 presents this decomposition in the more reader friendly form. As one can see, most of the gap comes from different returns to the same characteristics in the different sectors, not from different compositions of the sectoral labor force. Public sector workers are better educated and are overrepresented in white collar occupations. They are older and work less. Both characteristics affect hourly earnings positively. This advantage overcompensates the opposite effects of other characteristics, which in the private sector can be relatively more productive (workers are more likely to be male and urban). As a result, the overall (positive) effects of characteristics on the raw wage gap are insignificant in all years except a few.

The effect of returns is significantly negative for all years. Neither of the observable characteristics is a clear source of this disadvantage (Table 6). Regional and settlement characteristics have significantly negative returns effect in a few years. In fact, education and tenure tend to bring higher returns in the public sector. Most of the overall negative effect comes

from the constant and is attributable to unobservables. It appears that public sector workers have lower levels of productivity-related unobservables or have lower returns on such unobservables. This calls for closer examination of self-selection or sorting into the public sector, which is beyond the scope of this paper.

The most notable is the period from 2009 to 2011. In the 2009 crisis, the Russian government supported the budget sector employment heavily while allowing the private sector to downsize gradually. It spent significant budgetary resources on supporting employment and wages in the public sector while the private sector had to freeze wages. This could stimulate inter-sectoral flows of high skilled labor. However, the effect of the anti-crisis measures weakened gradually in the consequent years and became almost negligent by 2012. Its reappearance in 2013 is associated with the May 2012 Presidential Decree which by forcing the budget sector to increase wages made this sector more attractive for skilled labor.

5.2. Quantile regressions and decompositions

So far we have analyzed the wage gap at the mean of the distribution. Its size can vary across the distribution and have even the opposite signs in different parts. In order to get a more complete picture we use the quantile regression and the decomposition based on it. This exercise shows a much more complex story than that following from the OLS regression at the mean. We exploit the quantile regression including the same set of regressors (including the public sector dummy) as we utilized in the Mincer-type OLS equation. Table 4 contains the coefficient estimates for five points in the wage distribution (0.1, 0.25, 0.5, 0.75, 0.9) for the public sector dummy from conditional quantile regressions and Figure 5 presents the estimates of the public-private wage gaps expressed in percent.

The gaps are negative for all selected quantiles but vary in size across them. In lower parts of the conditional distribution the gaps are smaller in absolute values and increase towards the top. In other words, those public sector workers who are better paid in absolute terms (conditional on their characteristics) tend to lose more in relative terms. Moving to the alternative sector could bring them larger gains than those that emerge for lower paid workers. The implication of that seems obvious: the most skilled have stronger incentives to quit the public sector or to search for legal or semi-legal ways to close the gap. Collecting bribes for delivering public services emerges as the marginal option. But even if this not an option in general, the quality of services is likely to suffer.

The variation in conditional gaps across the quantiles tended to narrow over time. In the beginning of the period, the gaps were within 15-40 percent range; by 2014, the range narrowed

to 15-20 percent. We see two main episodes when the gaps were diminishing; these were in 2009 and 2012-2014.

In early 2008, when the Russian economy was at the peak of commodity-fueled growth, the Russian Government announced doubling the minimum wage and sometime later promised additional budgetary allocations to the public sector. The minimum wage increases affected public sector pay since the majority of minimum wage earners were located there. When the crisis came, the public sector wage got massive governmental support while the private sector had to adjust its wages downwards. This pushed the relative wage in the public sector, thus narrowing the gap.

The second episode of the gap reduction came in 2012-2014. The May 2012 Decrees were de-facto targeted on the most skilled leaving low skilled off the board. The largest relative gain was observed for those placed in higher conditional deciles while the gap for lower conditional deciles increased. This intervention changed the distribution of the conditional gap across quantiles – the pattern of penalty no longer varied along with skill levels. Figure 5 illustrates this tendency. The lines for the gaps at the 10th and 90th percentiles tended to converge over time. After 2012, these lines came closer to each other and this was due to narrowing the gap at the 90th percentile. This profile differed from what was observed in other countries where low skilled workers tended to benefit more (or lose less) than high skilled workers.

For a further exploration of the wage gap, we decompose it at the selected percentiles into the effect of characteristics and effects of coefficients (returns to these characteristics). For this we exploit the Machado-Mata style decomposition technique developed further by Chernozhukov et al. (2013)¹¹. Panel B of Figure 6 presents decomposition results for 2000, 2005, 2010 and 2014.

In all these years, the gaps were shaped (largely or completely) by difference in returns. In 2000, 2005 and 2010, the returns penalized top deciles much stronger than they affected the bottom deciles. In 2010, these penalties were partially (but far from completely) compensated by the positive effects of characteristics. The reason why this effect could become visible, we discussed earlier but this chart shows that this was spread evenly over the whole distribution. This more or less stable picture changed completely in 2014. First, the absolute size of the gap decreased and, second and probably more important, in the upper part of the distribution it became smaller than that in the lower one. Again, though the asymmetry in market returns to the public sector employment was preserved, those with higher wages emerged as relative winners

 $^{^{11}}$ We use *cdeco* module for *STATA* designed by Chernozhukov et al. (2013)

in contrast to the situations observed earlier. The 2012 May Decree did not eliminate the publicprivate wage gap but decreased its size and redistributed wage funds towards more skilled and better paid.

6. Why the gap does not disappear?

Persistence of the large wage gap and its variation across the wage distribution raise the obvious question of why it has not equalized over time. It would be quite logical to expect that underpaid public sector workers move to higher paid private jobs while private sector employers try to adjust wages downward bringing them closer to public sector alternatives. A few tentative explanations of why this has not happened follow below.

The first set of explanations assumes that the observed gap is of a virtual nature and reflects poor or incomplete measurements. According to this, were we better in capturing monetary and non-monetary components of earnings, on the one hand, and unobserved properties of workers and jobs, on the other, the gap would nearly evaporate or even become slightly positive as it is elsewhere. In other words, there should be no significant earnings penalty to public sector workers if all important features (concerning measured incomes, characteristics of workers and jobs) are properly accounted for.

We consequently checked for these possibilities. We started with exploring whether unmeasured (or poorly measured) incomes of public sector workers could have the equalizing effect. There are a few potential options for that. We may expect that public sector workers with shorter hours benefit from a higher frequency of moonlighting. However, adding second jobs into the equation does not change the general picture. As Table 2 suggests, the public sector has just marginally more (by 3-3,5 pp) second job holders than the private sector has and most of these jobs are unstable.

Then we can assume that there are non-labor incomes to which public and private sector workers have different access. For example, if public sector workers can retire earlier than that which is allowed in the alternative sector, then during a few years after entering retirement age they may have a combined income that contains earnings and pensions simultaneously, while the private sector workers are deprived of that option. In this case, the pension can be considered by public sector workers at a particular age interval as an explicit subsidy. However, even if this is the case, only a small group of workers is eligible for that and the duration of the option is under five years in total. Accordingly, females should have a smaller gap than males, but we see the opposite. Finally, an unobservable fraction of labor income in the public sector may have come from corruption. This can be if ordinary doctors and teachers get additional supplements selling their services for envelope money. If public sector workers are not that different than their private sector counterparts in terms of consumption while getting lower wages, the differential can be accrued to various types of bribes. Gorodnichenko and Sabirianova-Peter (2007) suggest this as the major explanation for the persistent wage gap in the Ukraine. For us, this explanation as a major clue does not seem convincing enough. If this were the case, it would be logical to assume that all or the majority of public sector workers have access to corruptive practices. Intuitively, it is clear that some doctors or teachers can strongly benefit from delivery of unregistered services. However, the public sector is too large and heterogeneous, and low skilled workers have few reasons to be regularly bribed.

We can also estimate the large gap erroneously because there are important unobservables on the supply side. These are omitted workers' characteristics that are related to unmeasured abilities. If, other things being equal, private sector workers have better (statistically) unobserved productive abilities, they would drive productivity up and therefore generate higher wages. Controlling abilities may narrow or close the gap. But there are reasons to believe that the unobserved abilities are unevenly distributed over workers and better pay is positively correlated with this unobserved property. Then the gap should decrease along the wage distribution while it tended to increase (the recent years made the exception).

Another set of unobserved characteristics relates to jobs. Longer vacations, earlier retirement age, additional social guaranties, higher social prestige and status can be valued highly by employees and therefore can make an important component of non-wage amenities. If attached to the public sector jobs, they can explain lower monetary wages that workers are ready to accept. Unfortunately, we can control few parameters of that sort, leaving most of them unaccountable. Probably, better control would diminish the gap. However, this cannot explain gap variation over time and across quintiles of the distribution. Besides that such properties are difficult to capture with survey data in any country but the wage gap remains usually slightly positive.

The second set of explanations may tell us a kind of segmentation story. If workers do not have better outside options due to some characteristics associated with their public sector attachment, they stick to underpaying jobs. This can be a stigma of low productivity if they are widely considered by private sector employers in this way. In this case, the public to private sector transition would require either a large loss in potential earnings (given the existing human capital) or a significant downgrade in the social status (to do a job for which they are greatly overeducated). This would decrease potential mobility gains while increasing costs. Another reason for the segmentation story may be caused by the fact that many public sector jobs require sector-specific education and skills that are not highly valued elsewhere. Examples of that are made by many teachers' occupations. Graduates from pedagogical universities can be good school teachers of biology or chemistry but of little demand as biologists or chemists outside the educational system. This attaches them to educational jobs leaving them with few alternative options.

Finally, we can search for explanations associated with the specifics of wage setting and labor market adjustment in the public sector. Why the private sector does not pay a lower wage if the alternative wage is much lower or why the public sector does not pay more if the negative selection into the sector is a threat? Private sector employers compete with each other and are afraid of losing the best workers if wages are unilaterally cut down. The public sector is limited in its upward wage adjustment due to its inherently political nature. As we discussed earlier, wage setting in the Russian public sector is independent from that in the private sector and low sensitive to alternative wage signals.

Any wage adjustment here needs complex governmental decisions and requires additional expenditures from the regional budgets which are often in deficit. The logic can be the following: the competition in the private sector leads to higher earnings, while the public sector reacts to the growing gap incompletely and with a delay. Meanwhile, elements of segmentation associated with sector specific education and skills constrain exit mobility from the public sector, thus helping to preserve the gap.

7. Conclusions

This paper explored how the public-private wage gap measured at various points of the wage distribution has changed since 2000. It presented two major empirical findings.

First, public sector workers earn less than their private sector counterparts and this holds throughout the whole wage distribution. This negative gap persists over time despite multiple governmental interventions that pretended to close it. Controlling for a broad set of observed characteristics does not change the outcome. Though the gap tended to decline, it remained negative in 2014. Second, the pay gap varied, behaving differently in the lower and the upper parts of the distribution. In the early 2000s, low skilled public sector workers experienced small gaps if any, while higher skilled were more strongly penalized. Major changes in gaps over the period were confined to two episodes attributed to 2008-2009 and 2013-2014. The 2008-2009

economic crisis affected relative wages causing gap reductions. This happened because public sector wages kept growing while private sector ones did not. By 2014, the public-private wage gap became largely flat over the quantiles, thus suggesting that public sector workers at the low end lost in relative terms while those at the upper end won.

These developments reflect a complex interaction of institutional, economic and political factors. The timing of events associated with these changes coincides with two major governmental interventions. These were the adoption of the New Pay System (NPS) in 2009 and the Presidential Decrees announced in May 2012.

The reform of 2009 was intended to decentralize wage-setting and to make it more flexible by dismantling the Unified Tariff System. Though the wide use of performance-related premiums and bonuses had always been an important ingredient in wage-setting practices in the Russian public sector, this reform made them more explicit and better institutionalized. The causal impact of the reform is hard to establish but high skilled jobs in these sectors seemed to be affected more than low skilled jobs (Androuschak et al, 2010). However, no precise targets or benchmarks for relative pay levels in the public sector were introduced.

These institutional innovations coincided with other important events that might shift relative wages. The doubling of the minimum wage that was put in effect in January 2009 (but announced early in 2008) affected positively the relative position of public sector workers at the lower part of the distribution. Their relative position improved visibly while the relative pay of those higher placed changed little. The economic crisis of 2008-2009 narrowed the gap further. The crisis caused a freeze in private sector wages improving thus the relative positions of the public sector workers in the middle and the upper parts of the distribution. However, with the start of economic recovery in 2010-2011 the gap bounced back to its previous levels annulling almost all changes in relative pay that happened before.

A completely different approach to the public sector pay was put forward in the May 2012 Presidential Decrees. By linking wages for major occupational groups to regional averages they introduced explicit pay targets for the public sector. The federal authorities strictly enforced the implementation of the Decrees in all regions though the responsibility of funding the pay increases was left to regional governments. Since additional budgetary allocations were insufficient to reach the targets, this led to severe cuts on other expenditures and extraordinary fiscal strain in sub-federal budgets.

The introduction and timing of the NPS and the May 2012 Presidential Decree had a clear political background. They were aimed to attract popular support before the Presidential

elections in 2008 and 2012. The second case is especially explicit. Public funds were redirected to favor certain groups within society (public sector workers) at the expense of other social groups and this decision was enacted by the President but not by the law. If successful this initiative should be associated with his name and contribute to his political popularity.

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Year	All	Females	Males
2000	0.22	0.33	0.11
2005	0.22	0.32	0.12
2010	0.22	0.31	0.13
2014	0.21	0.31	0.11

Table 1. Public sector, % of total employment

Table 2. Summary st	atistics: 2000-2014
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				U						
		Pu	blic			Pri	vate			
	2000	2005	2010	2014	2000	2005	2010	2014		
Age (years)	37.4	37.8	38.1	39.3	39.1	38.2	36.8	38.0		
Aged under 30 (%)	27.2	22.8	22.6	20.6	21.7	25.1	32.3	28.7		
Females (%)	75.0	72.3	70.5	73.6	43.4	43.3	43.3	43.5		
Rural (%)	29.5	31.1	33.9	36.1	26.7	24.1	23.3	23.0		
University educated (%)	39.8	40.5	42.6	45.7	16.5	20.2	27.0	29.7		
Occupation (%)										
White collar	74.2	69.6	69.9	72.3	27.3	29.4	35.2	37.4		
Services	12.4	12.3	13.1	14.4	14.0	15.5	17.0	16.1		
Blue collar	9.3	13.5	13.5	13.3	58.7	55.0	47.8	46.5		
Tenure (years)	7.7	8.9	9.1	9.1	7.4	6.7	6.4	6.5		
Working hours per week	40.2	41.1	40.2	40.6	44.8	45.2	45.4	45.0		
Part-time [*] (%)	15.4	14.8	13.9	11.1	5.8	4.1	4.5	4.2		
Monthly wage ^{**} (rubles)	1244	2535	3829	4459	1912	3771	5213	58.25		
Hourly wage ^{**} (rubles)	31.6	63.5	100.2	114.0	43.8	87.3	120.5	134.9		
Second job (%)	7.8	6.9	7.0	6.9	4.9	4.4	3.5	3.3		
Other labor incomes (%)	6.0	3.6	2.8	3.0	6.6	4.0	2.4	2.2		
Number of observations	779	897	1643	1250	2572	3175	5641	4524		

Note: *- working less than 30 hours per week. ** - in 2000 constant rubles.

Table 3.	Wage ine	equality: log-	wage differentials	

Year		Private		Public						
I Cai	90-10	90-50	50-10	90-10	90-50	50-10				
2000	2.26	1.08	1.18	1.90	0.83	1.07				
2005	1.95	0.92	1.03	1.67	0.80	0.88				
2010	1.71	0.84	0.88	1.64	0.83	0.81				
2014	1.57	0.79	0.78	1.66	0.83	0.83				

Year	0.10	Quantile Regression										
	OLS	0.1	0.25	0.5	0.75	0.9						
2000	-0.285*	-0.302*	-0.273*	-0.271*	-0.321*	-0.347*						
2000	(0.033)	(0.060)	(0.038)	(0.041)	(0.038)	(0.059)						
2001	-0.379*	-0.225*	-0.319*	-0.372*	-0.439*	-0.524*						
2001	(0.030)	(0.056)	(0.044)	(0.035)	(0.034)	(0.062)						
2002	-0.233*	-0.142*	-0.165*	-0.218*	-0.322*	-0.385*						
2002	(0.025)	(0.051)	(0.040)	(0.024)	(0.031)	(0.038)						
2003	-0.320*	-0.218*	-0.248*	-0.322*	-0.403*	-0.497*						
2005	(0.026)	(0.043)	(0.045)	(0.029)	(0.032)	(0.044)						
2004	-0.314*	-0.249*	-0.234*	-0.292*	-0.366*	-0.478*						
2004	(0.026)	(0.045)	(0.036)	(0.030)	(0.029)	(0.038)						
2005	-0.289*	-0.157*	-0.234*	-0.291*	-0.338*	-0.393*						
2003	(0.025)	(0.053)	(0.036)	(0.035)	(0.032)	(0.044)						
2006	-0.250*	-0.150*	-0.175*	-0.241*	-0.307*	-0.350*						
2000	(0.023)	(0.034)	(0.033)	(0.031)	(0.027)	(0.034)						
2007	-0.257*	-0.220*	-0.242*	-0.248*	-0.294*	-0.370*						
2007	(0.021)	(0.039)	(0.030)	(0.024)	(0.025)	(0.033)						
2008	-0.288*	-0.276*	-0.285*	-0.272*	-0.316*	-0.361*						
2008	(0.022)	(0.035)	(0.030)	(0.023)	(0.023)	(0.029)						
2009	-0.190*	-0.144*	-0.154*	-0.169*	-0.217*	-0.267*						
2007	(0.022)	(0.030)	(0.025)	(0.023)	(0.025)	(0.037)						
2010	-0.237*	-0.176*	-0.207*	-0.249*	-0.289*	-0.275*						
2010	(0.017)	(0.027)	(0.021)	(0.018)	(0.025)	(0.024)						
2011	-0.268*	-0.199*	-0.241*	-0.292*	-0.325*	-0.306*						
2011	(0.016)	(0.029)	(0.020)	(0.019)	(0.020)	(0.024)						
2012	-0.202*	-0.162*	-0.172*	-0.192*	-0.218*	-0.240*						
2012	(0.017)	(0.028)	(0.022)	(0.018)	(0.021)	(0.023)						
2013	-0.198*	-0.172*	-0.183*	-0.155*	-0.183*	-0.212*						
2015	(0.018)	(0.029)	(0.020)	(0.020)	(0.020)	(0.032)						
2014	-0.186*	-0.176*	-0.215*	-0.175*	-0.157*	-0.158*						
2017	(0.019)	(0.032)	(0.022)	(0.020)	(0.020)	(0.029)						

Table 4. Adjusted public-private wage gaps

Note: * p<0.05. Standard errors are in parentheses.

	Table 5. Mean and quantile decompositions														
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
A. Oaxaca-Blin	der Deco	mpositio	n												
Difference	-0.242*	-0.314*	-0.153*	-0.292*	-0.286*	-0.248*	-0.205*	-0.222*	-0.234*	-0.123*	-0.177*	-0.232*	-0.182*	-0.147*	-0.138*
	(0.033)) (0.030)	(0.026)	(0.028)	(0.026)	(0.027)	(0.024)	(0.023)	(0.024)	(0.024)	(0.018)	(0.018)	(0.019)	(0.020)	(0.021)
Characteristics	0.014	0.047	0.061*	-0.007	0.012	0.028	0.041	0.023	0.032	0.055*	0.049*	0.031*	0.004	0.043*	0.029
	(0.031)) (0.030)	(0.026)		(0.024)	(0.024)	(0.021)	(0.019)	(0.020)	(0.019)	(0.015)	(0.014)	(0.014)	(0.015)	(0.015)
Coefficients	-0.255*	· -0.361*	-0.213*	-0.285*	-0.299*	-0.277*	-0.246*	-0.245*	-0.267*	-0.178*	-0.226*	-0.263*	-0.186*	-0.190*	-0.167*
	(0.037)) (0.033)	(0.027)	(0.028)	(0.027)	(0.027)	(0.024)	(0.022)	(0.023)	(0.023)	(0.017)	(0.016)	(0.018)	(0.018)	(0.019)
B. Quantile Re	0	Based De	composit	ion											
Difference	-0.041	-0.071	0.094*	-0.173*	-0.121*	-0.114*	-0.128*	-0.156*	-0.182*	-0.036	-0.109*	-0.150*	-0.148*	-0.151*	-0.185*
	(0.049)											(0.020)	(0.025)	(0.027)	(0.033)
Characteristics	0.069	```	· · · ·	· · ·	0.000	· · ·	· · · ·	0.016	· · · ·	· · · ·	· · · ·	0.040*	0.010	0.041*	0.040
	(0.040)							(0.022)				(0.017)	(0.015)	(0.017)	(0.021)
Coefficients	-0.111*	· · · · ·	· · · ·	· · ·	· · · ·	· · · · ·	· · · ·	· · · ·	· · · ·	· · · ·	· · · ·	-0.190*	-0.158*	-0.191*	-0.225*
	(0.055)) (0.048)	(0.038)	(0.045)	(0.047)	(0.044)	(0.036)	(0.036)	(0.032)	(0.026)	(0.022)	(0.022)	(0.024)	(0.027)	(0.029)
0.2	5														
Difference	-0.146*	· -0.207*	-0.062*	-0.243*	-0.217*	-0.196*	-0.158*	-0.212*	-0.209*	-0.078*	-0.166*	-0.223*	-0.176*	-0.156*	-0.168*
	(0.037)) (0.038)	(0.029)	(0.033)	(0.029)	(0.031)	(0.031)	(0.027)	(0.028)	(0.025)	(0.020)	(0.018)	(0.021)	(0.022)	(0.025)
Characteristics	0.023	0.009	0.035	-0.055*			0.014	-0.002	0.012	0.052*	0.037*	0.025	0.003	0.021	0.023
	(0.032)				(0.024)			(0.019)			· · · ·	(0.015)	(0.014)	(0.015)	(0.016)
Coefficients	-0.169*							-0.210*				-0.248*	-0.179*	-0.177*	-0.191*
	(0.039)) (0.041)	(0.031)	(0.034)	(0.033)	(0.032)	(0.032)	(0.028)	(0.026)	(0.024)	(0.018)	(0.020)	(0.017)	(0.021)	(0.021)
0.4															
Difference	-0.259*											-0.272*	-0.198*	-0.137*	-0.133*
	(0.030)	· · · · · ·	```	```	```			(0.026)	· · · ·	· · · ·	· · · ·	(0.020)	(0.019)	(0.020)	(0.022)
Characteristics	-0.259*												0.000	0.019	0.011
~ ~ ~	(0.030)											(0.015)	(0.015)	(0.015)	(0.015)
Coefficients	-0.271*											-0.294*	-0.198*	-0.157*	-0.144*
0.7	(0.037)) (0.042)	(0.030)	(0.029)	(0.030)	(0.026)	(0.028)	(0.028)	(0.025)	(0.024)	(0.018)	(0.019)	(0.017)	(0.021)	(0.018)
0.75		: 0.445*	0.200*	0.250*	0.200*	0.215*	0.250*	0 204*	0.270*	0 102*	0.005*	0.202*	0.200*	0 102*	0.100*
Difference	-0.368*											-0.283*	-0.200*	-0.123*	-0.100*
Chamataniatica	(0.034) -0.002		· · · ·	· · ·	· · ·	· · ·	· · · ·	```	· · · ·	· · · ·	· · · ·	(0.024)	(0.020)	(0.020) 0.035	(0.024)
Characteristics	-0.002 (0.028)											(0.031)	0.004 (0.017)	0.035 (0.017)	0.017 (0.020)
Coefficients	-0.366*	```	```	· · ·	```	· · · · ·	· · · ·	· · · · ·	· · · ·	· · · ·	· · · ·	(0.017) -0.314*	-0.203*	-0.158*	-0.117*
Coefficients	(0.040)											(0.021)	(0.020)	(0.023)	(0.022)
0.9	· · ·	(0.044)	(0.055)	(0.034)	(0.051)	(0.052)	(0.030)	(0.050)	(0.027)	(0.028)	(0.021)	(0.021)	(0.020)	(0.023)	(0.022)
0.2	,														

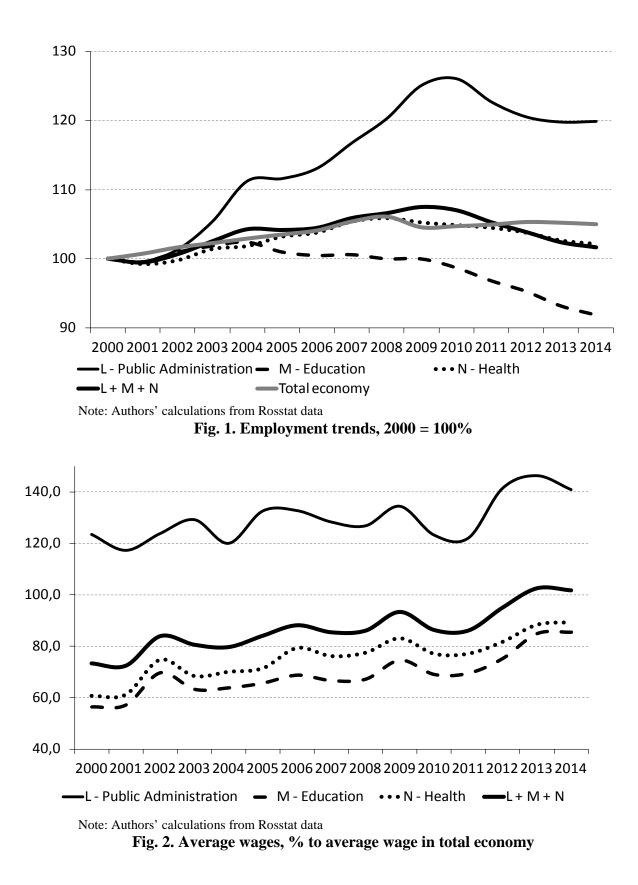
Difference	-0.412*	-0.510*	-0.357*	-0.398*	-0.417*	-0.365*	-0.307*	-0.256*	-0.297*	-0.203*	-0.218* -0.265*	-0.184*	-0.125*	-0.103*
	(0.046)	(0.046)	(0.037)	(0.040)	(0.037)	(0.035)	(0.033)	(0.037)	(0.035)	(0.037)	(0.030) (0.031)	(0.025)	(0.028)	(0.028)
Characteristics	0.017	0.119*	0.099*	0.062	0.064*	0.083*	0.103*	0.049*	0.081*	0.069*	0.075* 0.045	0.018	0.069*	0.025
	(0.035)	(0.040)	(0.039)	(0.032)	(0.030)	(0.034)	(0.031)	(0.022)	(0.026)	(0.023)	(0.021) (0.023)	(0.019)	(0.021)	(0.025)
Coefficients	-0.429*	-0.630*	-0.456*	-0.460*	-0.482*	-0.448*	-0.410*	-0.305*	-0.378*	-0.272*	-0.294* -0.310*	-0.202*	-0.194*	-0.128*
	(0.058)	(0.056)	(0.047)	(0.049)	(0.039)	(0.047)	(0.039)	(0.041)	(0.037)	(0.038)	(0.031) (0.030)	(0.026)	(0.030)	(0.027)

Note: * p<0.05.

2000 2005 2010 2											
		00	200	15		.0	201	4			
	coef	se	coef	se	coef	se	coef	se			
Difference	-0.242*	0.033	-0.248*	0.027	-0.177*	0.018	-0.138*	0.021			
Characteristics (total)	0.014	0.031	0.028	0.024	0.049*	0.015	0.029*	0.015			
Age	-0.002	0.004	0.010*	0.003	0.011*	0.003	0.010*	0.003			
Gender (1=male)	-0.101*	0.013	-0.106*	0.010	-0.083*	0.006	-0.096*	0.007			
Marital status (1=married)	-0.003	0.002	0.001	0.001	0.000	0.000	0.000	0.000			
Education	0.101*	0.015	0.062*	0.010	0.046*	0.005	0.035*	0.005			
Tenure	-0.006	0.004	0.000	0.006	-0.008*	0.004	-0.000	0.004			
Firm size group	-0.024*	0.009	-0.000	0.006	0.005	0.003	0.000	0.004			
Working hours	0.050*	0.009	0.054*	0.008	0.060*	0.005	0.052*	0.005			
Occupation	0.032	0.024	0.063*	0.017	0.047*	0.009	0.070*	0.010			
Type settlement	-0.022	0.013	-0.046*	0.009	-0.035*	0.005	-0.041*	0.005			
Region	-0.011	0.010	-0.009	0.007	0.005	0.004	-0.002	0.005			
Coefficients (total)	-0.255*	0.036	-0.277*	0.027	-0.226*	0.017	-0.167*	0.019			
Age	0.435	0.389	0.266	0.335	0.074	0.227	0.127	0.263			
Gender (1=male)	0.066*	0.017	0.005	0.014	-0.001	0.010	-0.012	0.010			
Marital status (1=married)	-0.052	0.047	-0.067	0.036	-0.012	0.025	-0.039	0.027			
Education	0.033	0.031	0.077*	0.024	0.010	0.017	0.102*	0.021			
Tenure	0.015	0.009	0.010	0.009	0.023*	0.006	0.028*	0.008			
Firm size group	0.047	0.027	-0.006	0.020	-0.010	0.013	-0.002	0.017			
Working hours	-0.028	0.020	0.004	0.015	0.023	0.013	0.006	0.016			
Occupation	0.145*	0.044	-0.016	0.029	0.033	0.022	-0.017	0.023			
Type settlement	0.075*	0.030	0.024	0.013	-0.025*	0.010	-0.021	0.012			
Region	-0.025	0.014	-0.030*	0.013	-0.032*	0.009	-0.016	0.012			
Number of observations	3 351		4 072		7 284		5 774				

Table 6. Detailed Oaxaca-Blinder decompositions

Note: * p<0.05.



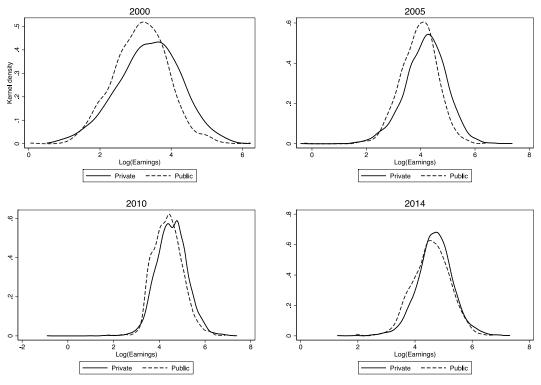


Fig.3. Kernel density estimates of the wage distributions

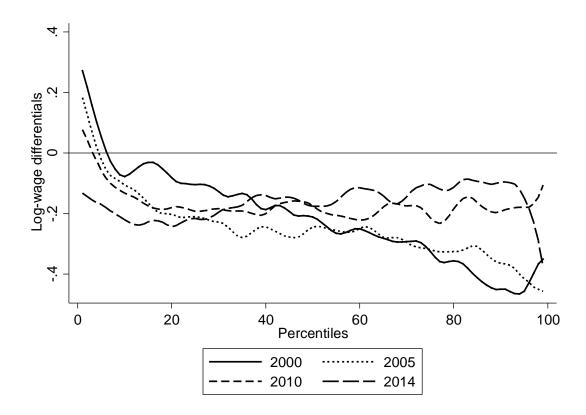


Fig.4. Smoothed raw public-private wage differentials by percentiles

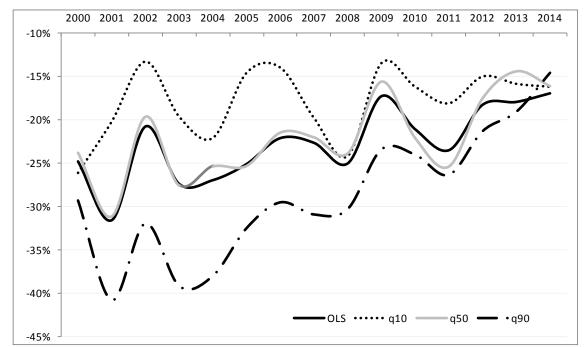
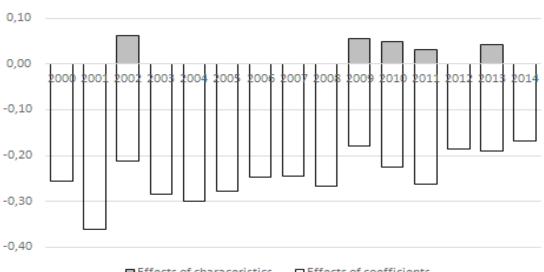
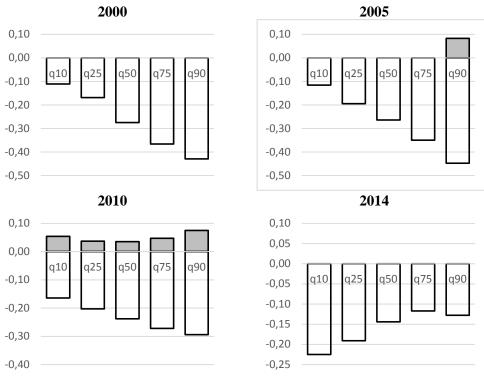


Fig.5. Public-private wage gaps a different points of the distribution (quantile regression)



A. Mean decompositions

Effects of characeristics



B. Quantile decompositions

Fig. 6. Mean and quantile decompositions

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