PUBLIC SECTOR WAGE PREMIUM IN SERBIA: EVIDENCE FROM SILC DATA

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ABSTRACT

In many European countries, employees in the public sector have higher average wages than workers in the private sector. This difference can partially be explained by better characteristics of the workers in the public sector, such as higher level of education or more work experience. However, previous research shows that even after we control these characteristics, the public sector pays higher wages i.e. that, in many European countries, there is a public sector wage premium. In other words, workers in the public sector earn more than the workers in the private sector, for the "same" job. Historically, in Serbia, public sector wage premium went from significantly negative, i.e. higher wages in the private sector (in 1995), to moderately positive premium (in 2008).

This paper aims to assess the wage gap between the public and private sector in Serbia, using Survey on Income and Living Conditions (SILC) data from 2013 and the wage decomposition methodology. In addition to providing new data on the gap in wages and public sector premium in Serbia, this paper aims to provide a better understanding of how different characteristics of the workers in the private and public sector affect the gap in wages.

Results show that in Serbia, in 2013, average hourly wage in the public sector was by 33.4% higher than in the private sector. As public sector workers have higher levels of education and are more likely to work in better paid jobs than workers in the private sector, the estimated value of the public sector wage premium is 17.2%. The estimated value of the public sector wage premium in Serbia is relatively high, when compared to the other European countries.

Key words: *Public Sector Wage Premium, Wage Differential, Survey on Income and Living Conditions, Serbia*

JEL Classification: *J31, J54, J45*

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INTRODUCTION

In many European countries, employees in the public sector have, on average, higher wages than workers in the private sector (European Commission, 2014). This difference between the private and the public sector can be partly explained by better characteristics of workers in the private sector, such as higher levels of education, more work experience, or a job in managerial position (de Castro, 2013). Since these characteristics are usually associated with higher levels of income, better characteristics of public sector workers (partially) "justify" the differences in earnings between the sectors.

However, the differences in the labour market characteristics often cannot explain the entire gap in wages between the public and private sector. The studies which use micro-data sets to statistically control for the differences in characteristics, show that the "same" work (in developed countries) is paid more in the public sector, i.e. that there is a positive public sector wage premium.

On the other hand, there are studies which show that salaries can be higher in the private sector, i.e. which show that the public sector premium is negative (European Commission, 2014). This trend is common in countries that are in transition from a socialist to a market economy. However, as the transition progresses, the advantage of the private sector is reduced, or the wages in the public sector to become higher than the wages in the private sector (Lausev, 2014). This was also the case in Serbia, where public sector wage premium was distinctly negative at the beginning of the transition (28% in 1995). During the transition years, the advantage of the private sector lowered and at the beginning of 2000's it changed to positive premium for working in the public sector (in 2008, according to Lausev, 2012).

The issue of the public sector wage premium is of particular importance in recent years, due to the effects of the economic crisis and the need to reduce public expenditure in many countries. Reduction of salaries in the public sector is considered less harmful to the economic growth than the reduction of other items of the public expenditure (de Castro, 2013, p. 3), and higher earnings in the public sector are taken as an argument that the reduction in earnings is the effective way of reducing expenditures.

The aim of this paper is to assess the wage gap between the public and private sectors in Serbia, using micro data from the Survey on Income and Living Conditions (SILC) from 2013 and the methodology of earnings decomposition (Blinder, 1973; Oaxaca, 1973). In addition to providing new data on the gap in wages between the sectors, this paper aims to provide an understanding of how different structure of workers in the private and public sectors affect the public sector wage premium.

BRIEF OVERVIEW OF THE RESEARCH ON THE GAP IN WAGES BETWEEN THE PUBLIC AND PRIVATE SECTORS

Research dealing with the assessment of the gap in wages between the public and private sectors can be based on the macroeconometric or microeconometric methods (Lausev, 2014). Macroeconometric methods are based on macro data of total cost of the private and public sector wages and the number of employees in these companies. This information is usually publicly available for many years. However, these data usually do not include the detailed data on workers' characteristics, so it is not possible to take into account the differences in these characteristics, and it is therefore not possible to estimate that the "true gap" in wages between the sector, i.e. the public sector wage premium.

On the other hand, microeconometric studies are based on individual data, so the detailed data on workers' characteristics are available, and the differences in these characteristics can be included into analysis. Since the focus of this paper is on the estimation the public sector wage premium, this review will include only microeconometric studies of the gap in wages between the sectors, in order to provide insights into recent years' trends.

The European Commission (2014) study, which was based on the Structure of Earnings Survey (SES) data, showed that, in 2010, on average, the wages were higher in the public sector than in the private sector, in most EU countries (except in Denmark, Finland, Slovakia and Hungary). Furthermore, the results show that the differences in wages may partly be explained by the better characteristics of public sector workers, and that when they are taken into account, the public sector wage premium is significantly lower, and that for some countries it is negative, i.e. the wages are, ceteris paribus, higher in the private sector.

Roughly divided, for the countries of Southern (Cyprus, Spain, Greece, Italy and Portugal) and Western Europe (Austria, Belgium, Germany, Ireland, Luxembourg and Slovenia, but not for France) there is a positive premium for working in the public sector, while for the countries of Central and Eastern (Bulgaria, the Czech Republic, Estonia, Hungary, Latvia and Slovakia, but not for Poland) and Northern Europe (Finland and Denmark) the wages are, ceteris paribus, higher in the private sector (European Commission, 2014).

Similar results were found in a study which uses the data from Survey on Income and Living Conditions (EU-SILC) for the period 2004 - 2007 (Giordano et al, 2011). On average, wages in the public sector in the countries of Western and Southern Europe (Austria, Belgium, Germany, Spain, France, Greece, Ireland, Italy, Portugal and Slovenia) were higher than in the private sector. In addition, although the differences in the characteristics of workers explain part of the gap in salaries, estimated premium of the public sector is still positive.

Laušev (2014) gives an excellent overview on the research that dealt with the wage gap between the public and private sectors in the countries of Eastern Europe (i.e. the countries in transition) using different data sources from the period from 1992 to 2004. The main conclusion of this study is that the wages for "same work"

in the public sector were significantly lower than in the private sector at the beginning of the transition, but that this advantage of the private sector disappears when reaching the maturity of economic transition. In addition, for some countries at the end of the transition premium public sector becomes positive, indicating a convergence between trends in developed countries and countries in transition.

A large part of the empirical work on the gap in wages between the sectors is dedicated to comparison of the gap between the genders and level of education. In general, the results for the developed economies indicate that the public sector premium is higher for women and workers with lower levels of education (Giordano et al, 2011).

In the paper already discussed, Giordano et al, (2011), use the data from the EU-SILC (2004-2007) and show that the public sector wage premium is positive and above average for people with low education, while for the workers with high level of education, the premium is negative. In addition, the premium of the public sector is higher for women than for men in all countries, although in some countries this difference was not statistically significant (Giordano et al., 2011).

On the other hand, according to European Commission report (European Commission, 2014) on average, in the European Union, the men have positive public sector wage premium, while there are no significant differences between public and private sector in female wages. In addition, the results indicate that there is a positive public sector wage premium, but not only at low levels of education, but also at high, indicating the harmful effects of taking high-quality workforce from the private sector. The authors suggest that these results are surprising and contradicted the findings of previous research.

On the other hand, the results of the same survey indicate that there are large differences between the countries of the European Union in this respect, and that, in some countries, women have a higher public sector wage premium than men, while in other countries, men have a higher positive or lower negative public sector wage premium than women. This may be the result of different trends in developed economies and countries in transition, where women on average have the same level of negative public sector premium as well as men (Lausev, 2014).

In one of the first studies in Serbia, Jovanovic and Lokshin (Jovanovic, Lokshin, 2003, according to Lausev, 2012), found a negative public sector wage premium of 9.4% for men and 4% for women using data from the Labour Force Survey from 2000. The next significant study, also using the data from Labour Force Survey, showed that between 1995 and 2003, the negative premium of the public sector decreased from 28.5% to only 8% (Krstić et al.,2007, according to Lausev, 2012 , p.9). Finally, between 2004 and 2008, the public sector wage premium, firstly reached zero (in 2004) and then became positive (in 2008) for workers with low or medium level, while for workers with high levels of education, it was first negative (2004) and then positive (in 2008). In addition, positive public sector premium was significantly higher for workers with low levels of education than for those with higher levels of education (Lausev, 2012, p. 21).

METHODOLOGY AND DATA

Public private wage gap represents a simple difference in mean hourly wages in the public and private sectors, expressed as a percentage of hourly wages in the private sector. This gap can also be calculated as a difference between the average natural logarithms of hourly wages or as a regression coefficient of in an earnings equation, in which the dummy variable for the sector is the only predictor (see more detail on Mincer earnings equation further in the text).

As previously explained, the gap in the wages between the public and private sector can partially be explained by differences in the labour market characteristics of workers in the public and private sectors, such as education, occupation, etc. Therefore this gap is called the *unadjusted wage gap*, since it does not account for the differences in the workers characteristics.

When we statistically control for these differences, so the gap represents the differences in wages between the sectors for the same job, we call this gap the *adjusted public-private wage gap*, or the *public sector wage premium*. To assess the *public sector wage premium* we need to include other variables relevant to the wage size (such as education, work experience, etc.) into the wage equation. Then the regression coefficient on the dummy variable indicating the public or private sector employment is an estimate of the public sector wage premium.

We can also calculate the unadjusted and adjusted wage gaps by using the Blinder-Oaxaca decomposition. In the terminology of the Blinder-Oaxaca decomposition, the total unadjusted gap in earnings between the public and private sector can be divided into *explained* part and *unexplained* part. While the explained part of the gap is the part due to the differences in characteristics between the workers in the sectors, the unexplained part of the gap is due to differences in returns for the different characteristics at the labour market (e.g. if the public sector puts a higher value to workers' higher level of education). It is this second, unexplained part of the difference in wages that represents *the public sector wage premium*.

To explain the Blinder-Oaxaca decomposition we start from the simple (Mincer) wage equation:

$$y_i = \ln(Y_i) = \alpha + \beta P_i + \boldsymbol{X}_i' \boldsymbol{\gamma}_k + \varepsilon_i \,, \qquad (1)$$

In which the dependent variable, log wages are regressed on the vector of individual and job characteristics - X_i, such as education, work experience, occupation and sector of activity (Mincer, 1974). Since the focus of this paper is to estimate the public sector wage premium, the variable that indicates the work in the public or private sector was singled out and presented as separate variable (P_i), and the coefficient next to this variable (β) indicates the public sector wage premium. As previously stated, in a situation in which other relevant variables (X_i) are omitted, the coefficient β is reduced to a simple percentage difference between the wages in the public and private sectors. i.e. unadjusted pay gap.

As previously mentioned, Blinder-Oaxaca decomposition splits the unadjusted gap in wages between the public and private sector to explained and unexplained part of the gap (Blinder 1973, Oaxaca, 1973). Blinder-Oaxaca decomposition is based on the separate estimations of the Mincer wage equation for the public and private sectors:

$$y_i^P = \boldsymbol{X}_i^{P\prime}\boldsymbol{\theta}_k^P + \varepsilon_i^P, \text{ for the private sector} \quad (2a)$$

$$y_i^J = \boldsymbol{X}_i^{J\prime}\boldsymbol{\theta}_k^J + \varepsilon_i^J, \text{ for the public sector} \quad (2b)$$

where $\boldsymbol{X}_i^{P\prime}$ and $\boldsymbol{X}_i^{J\prime}$ are the vectors of the individual and job characteristics of the workers in the public and private sector respectively, $\boldsymbol{\theta}_k^P$ i $\boldsymbol{\theta}_k^J$ are the respective slope coefficients, and ε_i^Pi ε_i^J are the respective error terms from the wage equations for the public and private sector. If we assume that the expected value of the errors in the model is equal to zero, the difference in expected value of wages in the private and public sectors can be written as:

$$E(y_i^J) - E(y_i^P) = E(\boldsymbol{X}_i^{J\prime})\boldsymbol{\theta}_k^J - E(\boldsymbol{X}_i^{P\prime})\boldsymbol{\theta}_k^P \quad (3)$$

After the coefficients are estimated via ordinary least squares, the difference in the average wages between the public and private sectors (unadjusted pay gap) can be written as:

$$\bar{y}^J - \bar{y}^P = \bar{\boldsymbol{X}}^{J\prime}\hat{\boldsymbol{\theta}}_k^J - \bar{\boldsymbol{X}}^{P\prime}\hat{\boldsymbol{\theta}}_k^P. \quad (4)$$

After sorting the equation 4 can be rewritten as:

$$\bar{y}^J - \bar{y}^P = (\bar{\boldsymbol{X}}^J - \bar{\boldsymbol{X}}^P)'\hat{\boldsymbol{\theta}}_k^J + \bar{\boldsymbol{X}}^{P\prime}(\hat{\boldsymbol{\theta}}_k^J - \hat{\boldsymbol{\theta}}_k^P) \quad (5)$$

The last equation shows the basic Blinder-Oaxaca decomposition: the gap in wages is a sum of the explained and the unexplained part of the gap (i.e. the public sector wage premium). The estimate of the explained part of the gap is based on the difference between the average characteristics of the workers from the public and private sectors ($\bar{\boldsymbol{X}}^J - \bar{\boldsymbol{X}}^P$), weighted by the regression coefficients from the public sector wage equation ($\hat{\boldsymbol{\theta}}_k^J$). On the other hand, estimation of the unexplained part of the gap is based on the difference between the slope coefficients from the public and private sectors earning equation ($\hat{\boldsymbol{\theta}}_k^J - \hat{\boldsymbol{\theta}}_k^P$), weighted by the average workers' characteristic in the private sector ($\bar{\boldsymbol{X}}^P$) (Jann, 2008).

In addition, Blinder-Oaxaca decomposition enables the isolation of the effect of each variable on both explained and unexplained part of the gap. Therefore, it is possible, for example, to assess which part of the gap in earnings between the public and private sectors is due to differences in the level of education, and which is due to differences in the average work experience (Jann, 2008).

DATA AND SAMPLE

To estimate the public sector wage premium we use micro-database from the Survey on Income and Living Conditions (SILK) from 2013. The survey, conducted by the Republic Statistical Office of Serbia (SORS), provides nationally and regionally representative data on income, poverty and living conditions for Serbia and is the most important instrument for the comparative assessment of poverty in the European Union (according to EUROSTAT), as well as in Serbia.

The sample included 6,501 households, and data were collected at both the household and the individual level. Data include weights, provided by SORS, which are used to correct estimates of descriptive statistics and econometric estimates for the likelihood that a household is selected in a sample from the population of Serbian households.

The sample for the regression analysis consists of 3,931 employees (2,052 employees in the public and 1,879 employees in the private sector) for which information on wages was available. The sample includes only people in the age group 15-64. The analysis did not include self-employed and unpaid family members, informal employment workers, as well as the employees who do not receive a salary at work. Additionally, in accordance with the recommendations from the literature (e.g. European Commission, 2014), we excluded from the analysis the employees in the agricultural sector, as well as military personnel.

The main independent variable is based on ownership question: "What is the form of property in which you work?" which has four possible answers: "Not registered", "Private registered", "Public / state" and "Other (social, mixed, etc.)". The analysis involved only those who answered "Private registered" and "Public / state". The main dependent variable, as already mentioned, is the natural logarithm of net hourly wages.

RESULTS

According to the SILC data, in May 2013, the average monthly wage in the public sector was by 22.8% higher than wages in the public sector (Table 1). The difference between hourly wages was higher, and amounted to 33.4%, as the workers in the private sector, on average work about 4 hours longer per week than workers in the public sector.

Table 1: The difference in the average monthly wages, average hours worked and average earnings per hour of work in the public and private sectors

	Average monthly wage (in RSD)	Average hours worked	Average hourly wage (in RSD)
Private sector	34,993	44.1	172.7
Public sector	42,967	40.5	230.5
Difference (%)	*22.8%*	*-8.0%*	*33.4%*

Source: Own calculation based on the SILC 2013 data. Note: The average hourly wage is calculated as the ratio of monthly earnings and weekly hours worked and multiplied by 23/5 (number of working days in the month divided by the number of days in the working week).

Table 2 shows the estimation of five different specifications Mincer wage equation (equation 1). Table 2 presents only the estimated coefficients for the variable denoting the work in the private or public sector, while the full specification is in Table A1 in the Appendix. All the coefficients have expected signs: wages are higher for the higher levels of education, work experience and age; they are higher for men than for women; they are the highest for Managers, then for Professionals, Technicians and Clerks, slightly lower for Service and sales workers, Craft and trades workers, Plant and machine operators and the lowest for the Elementary occupations; the wages are higher in industry, compared to services; for the permanent jobs, compared to temporary; higher in cities, and in Belgrade, compared to other regions.

Table 2: Mincer earnings equations - estimation of the gap between wages in the public and private sectors

Variables in the model	S0	S1	S2	S3	S4
Public sector	0.334***	0.207***	0.214***	0.161***	0.172***
Education and work experience		x	x	x	x
Gender and age			x	x	x
Job characteristics[1]				x	x
Region and type of settlement					x
Sample size	3.931	3.931	3.931	3.931	3.931

*Source: Own calculation based on the SILC 2013 data Notes: The table A1, with the estimated coefficients and standard errors is attached in Appendix. 1Occupation, sector of activity (industry and services), type of contract (permanent or temporary) *** p <0.01, ** p <0.05, * p <0.1*

The coefficient in the specification S0, where the sector is the only variable in the equation, as stated before, is the unadjusted wage gap in wages between the public and private sectors. The coefficient indicates that public sector wages are on average by 33.4% higher, compared to the private sector. This is the same value that is obtained in the Table 1, as the percentage difference between the hourly wages in the private and public sector.

Specifications S1 to S4 represent the wage gap when adjusted for differences in the labour market characteristics. When we include education and work experience in the regression equation, the gap in wages between the sectors shrinks to 20.7%. In other words, workers in the public sector earn 20.7% higher hourly wages than the workers of the same educational level and work experience in the private sector.

The public sector wage premium does not change significantly when sex and age are included in the wage equation (column S2). On the other hand, when job characteristics such as occupation, activity sector (industry and services) and the type of contract are controlled for, the difference between the wages further shrinks to 16.1% (column S3). Finally, when we include the effects of the region and type of settlement, we get a final assessment of the public sector wage premium of 17.2%. In other words, public sector workers earn, on average, 17.2% higher earnings than private sector workers who are of the same educational level and work experience, gender and age, whose work has the same job characteristics (in terms of the occupation, sectors of activity and type of contract), in the same region and type of settlement.

Estimated value of the regression coefficients from Mincer equations (Table 2) can be summed up in the basic Blinder-Oaxaca decomposition (Table 3). The estimations are calculated based on the equation 5. The difference in average hourly wages between the public and private sector is 33.4%. Almost half of the gap (i.e. 48.5% of the difference: 16.2% from 33.4%) in wages between sectors can be explained by better labour market characteristics of the public sector workers (higher education level, more work experience and as they work in better paid occupations). The remaining, unexplained part of the gap represents the public sector wage premium, which amounts to 17.2%. This difference represents different "rewards" for the employees in the public and private sector for doing the same work.

Table 3: Blinder-Oaxaca decomposition

Private sector (average log hourly wage)	5.027
Public sector (average log hourly wage)	5.361
Unadjusted difference in wages	0.334
Explained part of the gap	0.162
Unexplained part of the gap	0.172

Source: Own calculation based on the SILC 2013 data

As mentioned above, public sector workers have better labour market characteristics than workers from the private sector, and this difference in

characteristics explains almost half of the difference in their earnings. Table 4 summarizes the basic differences in these characteristics that significantly affect the difference in wages. In the table, labour market characteristics are divided to those that "increase" and those which "reduce" the wages, in the sense that workers with these characteristics, on average, have a higher or lower wages. Table was formed on the basis of detailed Blinder-Oaxaca decomposition (Tables A2 and A3 in the appendix), as well as the results from the comparison of the characteristics of the public and private sector workers (Table A4 in the appendix).

Firstly, the majority of the differences in wages can be explained by differences in occupations. This is primarily due to greater participation of Professionals (ISCO 2 group, 31.5% in the public versus only 10% in the private sector), as well as Technicians (ISCO 3 group, 22.4% versus 15.1%) in the public than in the private sector (Table A4 in the Appendix). Since these occupations, on average, are better paid, part of the differences in wages is due to the fact that work in the public sector requires more high-skilled occupations.

Table 4: Detailed Blinder-Oaxaca decomposition - summary

	... which "increase" their wages	... which "decrease" their wages
Labour market characteristics of the public sector workers...	- More frequently working in better-paid occupation - Hihger level of education - More working experience - More permanent contracts - More frequently from urban areas	- More women - More workers in the services sector

Source: Own calculation based on the SILC 2013 data. Note: Full estimation of the coefficients from the Blinder-Oaxaca decomposition is presented in the Table A2 in the Appendix

Furthermore, the public sector is also characterised in a higher share of employees with college or university education (43.7% of employees in the public versus the 23.8% of employees in the private sector), as well as a longer work experience in public sector employment (average employment experience in the public sector is 19 years, while in the private 14.3 years). Public sector workers also have a larger share of the permanent contracts, (91.4% versus 79.5% in the private sector), which show higher wages then temporary contracts; as well as greater participation of employees in urban areas (73.8% versus 68.5% in the private sector), where the wages are generally higher.

On the other hand, the public sector is characterized by two features that reduce the wages. The public sector employs more women, and has a higher share of workers in the service sector, compared to industry (Table A4). As women on average earn less than men, and as the work in the service sector is paid less than

work in the industry, these characteristics "reduce" the average wage in the public sector. In other words, if the public and private sector would have the same participation of women and share of services workers, ceteris paribus, the unadjusted wage gap between the public and private sectors would be even higher.

Table 5 shows the estimated value of the public sector wage premium separately on sub-samples by sex and age. Analysis of the separate sub-samples of men and women suggests that, on average, the unadjusted wage gap between the sectors is higher for women than for men. Women in the public sector have on average 36.5% higher earnings than women in the private sector, while for men this difference amounts to 31.8%. However, the wage gap between the public and private sectors for women can be explained by the labour market characteristics to the greater extent then for men. This is primarily due to higher participation of Professionals (ISCO 2 group) in the public sector for women. When controlling for these and all other differences between the sectors in individual and job characteristics (listed in Table 2), estimated public sector wage premium is significantly lower for the women than for the men. For the women, the premium amounts to 10.6%, while for the men it is 20.3%.

On the other hand, the analysis by different age groups indicates that the trends in all the age groups are similar. The largest unadjusted public private wage gap is among young workers (15-29 years) which is estimated at 33.8%, while the gap is somewhat lower in two older age groups (30/44 and 45/64), approximately 31%. For all age groups, explained the value of the work gap is estimated at about 13 to 14%. Since the explained part of the gap is the same for all the groups, the order of the age groups by the size of the public sector wage premium remains unchanged. It is the highest for the youngest age group, where it stands at 20.9%, while for the older groups it stands on about 17%.

Table 5: Blinder-Oaxaca decomposition by gender and age

	Sex		Age		
	Women	Men	15-29	30-44	45-64
Private sector	4.966	5.075	4.901	5.055	5.078
Public sector	5.331	5.393	5.239	5.364	5.384
Difference	0.365	0.318	0.338	0.309	0.306
Explained part	0.259	0.115	0.130	0.140	0.138
Unexplained part	0.106	0.203	0.209	0.169	0.168
Sample size	*1,869*	*2,062*	*608*	*1,793*	*1,530*

Source: Own calculation based on the SILC 2013 data. Note: Full estimation of the coefficients from the Blinder-Oaxaca decomposition is presented in the Table A5 in the Appendix.

A separate analysis by educational level points to several interesting trends (Table 6). Contrary to previous research, the unadjusted gap in wages is the lowest for the

workers with the primary level of education. The gap is estimated at 6% and it is not statistically significant. However, the sample for the estimation of the gap at this level of education is relatively small (total of 344 employees in the public and private sector), so it is possible that with a larger sample and we would get different results.

Secondly, the unadjusted gap in wages between the private and public sectors is higher among employees who have completed secondary education - 26.8%, than for those who have completed college or university - 23.9%. The explained part of the gap is larger at the tertiary level of education, so the differences in the public sector wage premium are even more pronounced. The estimated adjusted wage gap between the public and private sector, i.e. the public sector wage premium is 20.6% for the secondary and 13.1% for the tertiary level of education.

Table 6: Blinder-Oaxaca decomposition by education level

	Education level		
	Primary or no school	Secondary	Tertiary
Private sector	4.827	4.921	5.397
Public sector	4.887	5.189	5.637
Difference	0.060	0.268	0.239
Explained part	0.041	0.062	0.108
Unexplained part	0.020	0.206	0.131
Sample size	344	2,353	1,234

Source: Own calculation based on the SILC 2013 data. Note: Full estimation of the coefficients from the Blinder-Oaxaca decomposition is presented in the Table A6 in the Appendix.

DISCUSSION AND CONCLUSIONS

This paper aimed to estimate the public private sector wage gap in Serbia using the Blinder-Oaxaca decomposition and the data from the EU-SILC from 2013. Similar to the situation in many European countries (European Commission, 2014), the results show that hourly wages in the public sector in Serbia are higher than in the public sector (33.4%). A significant part of this difference can be explained by differences in the labour market characteristics between the workers in the sectors. Most importantly, public sector workers have, on average, higher levels of education and more work experience and they are more likely to work as Professionals or Technicians (occupations that are paid better than other) than workers in the private sector. When these differences in the characteristics are statistically kept constant, the value of the public sector wage premium is estimated at 17.2%. In other words, workers in the public sector have by 17.2% higher wages for doing the "same" job than the workers in the private sector.

The estimated value of the public sector wage premium in Serbia is high when compared to other European countries, since, according to the European Commission report (European Commission, 2014), higher public sector wage premium is present only in Ireland, Luxembourg and Cyprus. However, this comparison has to be made with caution, since the data analysed in the report and in this research are different (Structure of earnings survey vs. Survey on Income and Living Conditions).

The results also point to some interesting departures from the general trends in the literature, which suggest that the gap should be higher for women and people with low level of education (Giordano et al, 2011). However, recent research show that these conclusions are not uniform, so that on average, in the European Union, men have higher positive public sector wage premiums than women, and that the public sector premium occurs at all levels of education (European Commission, 2014). The differences might be due to the effects of the economic crisis, which could produce new trends of premium public sector by different groups, but also due to the fact that different data sources point to different conclusions. Our data suggest that, although the unadjusted wage gap is higher for women than for men, the estimated value of the public sector wage premium is higher for men. This occurs because the labour market characteristics explain the wage gap better for women than for men.

Historically, the estimated value of the public sector wage premium in this research indicates that, in Serbia, the gap in wages between the public and private sectors went through a full cycle: from significantly higher wages in the private sector before 2000 (maximum of about 28% in 1995), through zero and positive premium for working in the public sector (2004 and 2008, according to Lausev, 2012), to now extremely high value of the premium of the public sector in Serbia (17.2% in 2013), indicated by this research. This result is consistent with theoretical considerations on the gap in wages in the public sector in countries in transition, presented by Laušev (2014). The negative premium of the public sector from the initial transition period, after the country reaches its mature phase, approaches zero or becomes positive due to the fact that market mechanisms take primacy in determining the wages in the sectors (Lausev, 2014).

Wage gap between the public and private sector is an important question from the perspective of the public policy. Unequal wages of workers in the public and private sectors can cause distortions on the labour market, especially if one takes into account that a job in the public sector often also carries a higher degree of job security and benefits. The presence of the premium in wages in the public sector, with other, more favourable benefits, may lead workers to have strong preferences to work in the public sector, which means that less skilled labour remain to work in the private sector. Taking this into account, a precise estimate of the gap in wages between the public and private sectors, together with other analytical information provides a basis for decision-making on whether it can be justified to "save" part of the public expenses by reducing public sector wages.

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APPENDIX

Table A1: Mincer wage equation

VARIABLES	S0	S1	S2	S3	S4
Public sector	*0.334****	*0.207****	*0.214****	*0.161****	*0.172****
	(0.016)	*(0.016)*	*(0.016)*	*(0.016)*	*(0.016)*
Primary (omitted)		-	-	-	-
		-	-	-	-
Secondary		0.208***	0.208***	0.103***	0.076***
		(0.023)	(0.023)	(0.024)	(0.024)
Tertiary		0.687***	0.702***	0.313***	0.275***
		(0.026)	(0.026)	(0.034)	(0.033)
Work Experience		0.007***	0.006***	0.006***	0.005***
		(0.001)	(0.002)	(0.002)	(0.001)
Gender (Female=1)			-0.130***	-0.138***	-0.141***
			(0.014)	(0.014)	(0.014)
Age			0.020***	0.019***	0.019***
			(0.006)	(0.005)	(0.005)
Age Squared			-0.000***	-0.000***	-0.000***
			(0.000)	(0.000)	(0.000)
Senior officials and managers				0.711***	0.698***
				(0.049)	(0.048)
Professionals				0.600***	0.575***
				(0.035)	(0.034)
Technicians and associate professionals				0.366***	0.357***
				(0.025)	(0.025)
Clerks				0.296***	0.278***
				(0.030)	(0.029)
Service and sales workers				0.105***	0.110***
				(0.027)	(0.026)
Craft and trades workers				0.127***	0.141***
				(0.028)	(0.027)
Plant and machine operators				0.170***	0.187***
				(0.030)	(0.030)
Elementary occupations (omitted)				-	-
				-	-
Activity sector (Services=1)				-0.072***	-0.094***
				(0.018)	(0.017)

Note: Continued on the next page

Table A1: Mincer wage equation – continued from the previous page

VARIABLES	S0	S1	S2	S3	S4
Public sector	*0.334****	*0.207****	*0.214****	*0.161****	*0.172****
	(0.016)	*(0.016)*	*(0.016)*	*(0.016)*	*(0.016)*
Type of contract (Temporary=1)				-0.066***	-0.062***
				(0.021)	(0.021)
Settlement (urban = 1)					0.081***
					(0.014)
Belgrade (omitted)					-
					-
Vojvodina					-0.095***
					(0.018)
West Serbia					-0.131***
					(0.018)
East Serbia					-0.157***
					(0.019)
Constant	5.027***	4.627***	4.309***	4.343***	4.409***
	(0.012)	(0.025)	(0.109)	(0.101)	(0.099)
Observations	*3,931*	*3,931*	*3,931*	*3,931*	*3,931*
R-squared	0.108	0.331	0.349	0.433	0.455
F	412.5	453.2	281.9	185.0	154.6
P	<0,001	<0,001	<0,001	<0,001	<0,001
Adjusted R-squared	0.107	0.330	0.348	0.431	0.452

*Source: Own calculation based on the SILC 2013 data. Notes: Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1*

Table A2: Blinder-Oaxaca decomposition – Grouped effects

VARIABLES	Explained part		Unexplained part	
Education	-0.040***	(0.006)	-0.072	(0.046)
Work Experience	-0.024***	(0.007)	-0.041	(0.050)
Gender (Female=1)	0.011***	(0.003)	-0.000	(0.014)
Age	0.000	(0.008)	0.002	(0.217)
Occupation (ISCO 1-digit)	-0.111***	(0.010)	-0.100**	(0.043)
Activity sector (Services=1)	0.012***	(0.003)	0.032	(0.026)
Type of contract (Temporary=1)	-0.007***	(0.003)	0.007	(0.006)
Settlement (urban = 1)	-0.004***	(0.001)	-0.006	(0.019)
Regional effects	0.000	(0.002)	-0.006	(0.022)
Constant			0.012	(0.204)
Observations	3,931		3,931	

*Source: Own calculation based on the SILC 2013 data. Notes: Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1*

Table A3: Blinder-Oaxaca decomposition – detailed effects

VARIABLES	Explained part		Unexplained part	
Primary education	-	-	-	-
Secondary education	0.015***	(0.005)	-0.030	(0.027)
Tertiary education	-0.055***	(0.008)	-0.042*	(0.023)
Work Experience	-0.024***	(0.007)	-0.041	(0.050)
Gender (Female=1)	0.011***	(0.003)	-0.000	(0.014)
Age	-0.100***	(0.027)	-0.093	(0.424)
Age Squared	0.100***	(0.027)	0.095	(0.225)
Senior officials and managers	-0.004	(0.005)	-0.005	(0.004)
Professionals	-0.124***	(0.011)	0.010	(0.015)
Technicians and associate professionals	-0.026***	(0.005)	-0.020**	(0.010)
Clerks	-0.003	(0.003)	-0.009*	(0.006)
Service and sales workers	0.018***	(0.004)	-0.038***	(0.009)
Craft and trades workers	0.017***	(0.004)	-0.025***	(0.007)
Plant and machine operators	0.012***	(0.003)	-0.013**	(0.005)
Elementary occupations (omitted)	-	-	-	-
Activity sector (Services=1)	0.012***	(0.003)	0.032	(0.026)
Type of contract (Temporary=1)	-0.007***	(0.003)	0.007	(0.006)
Settlement (Urban = 1)	-0.004***	(0.001)	-0.006	(0.019)
Belgrade	-	-	-	-
Vojvodina	-0.005***	(0.002)	-0.000	(0.009)
West Serbia	-0.000	(0.002)	-0.000	(0.009)
East Serbia	0.005**	(0.002)	-0.006	(0.007)
Constant			0.012	(0.204)
Observations	*3,931*		*3,931*	

*Source: Own calculation based on the SILC 2013 data. Notes: Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1*

Table A4: Comparison of workers characteristics in the public and the private sectors

VARIABLES	Public sector mean	Private sector mean	Difference	T test
Primary education	0.078	0.084	-0.009	-0.952
Secondary education	0.485	0.677	-0.192***	-12.533
Tertiary education	0.437	0.238	0.201***	13.89
Work Experience	19.016	14.299	4.534***	13.811
Gender (Female=1)	0.521	0.441	0.078***	4.913
Age	43.519	38.296	4.989***	15.272
Age Squared	0.042	0.035	0.008	1.302
Senior officials and managers	0.315	0.100	0.219***	18.19
Professionals	0.224	0.151	0.070***	5.703
Technicians and associate professionals	0.102	0.092	0.007	0.778
Clerks	0.093	0.254	-0.161***	-13.406
Service and sales workers	0.069	0.187	-0.118***	-10.828
Craft and trades workers	0.059	0.124	-0.069***	-7.401
Plant and machine operators	0.096	0.056	0.044***	5.124
Elementary occupations (omitted)	0.813	0.684	0.132***	9.459
Activity sector (Services=1)	0.086	0.205	-0.119***	-10.607
Type of contract (Temporary=1)	0.738	0.685	0.059***	3.961
Settlement (Urban = 1)	0.314	0.297	0.009	0.658
Belgrade	0.235	0.285	-0.051***	-3.644
Vojvodina	0.243	0.244	0.004	0.263
West Serbia	0.207	0.174	0.038***	2.923
East Serbia	0.078	0.084	-0.009	-0.952
Observations	1,879	2,052		

*Source: Own calculation based on the SILC 2013 data. Notes: Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1*

Table A5: Blinder-Oaxaca decomposition by gender and age

	Sex		Age		
	Women	Men	15-29	30-44	45-64
Education	-0.040***	-0.033***	-0.027**	-0.049***	-0.041***
	(0.007)	(0.008)	(0.010)	(0.009)	(0.010)
Age	0.000	0.000	-	-	-
	(0.000)	(0.000)	-	-	-
Work History (years)	-0.021***	-0.019***	-0.003	-0.009***	-0.001

	(0.007)	(0.005)	(0.003)	(0.003)	(0.001)
Female	-	-	0.015**	0.009**	0.012***
	-	-	(0.007)	(0.004)	(0.004)
Occupation (ISCO 1-digit)	-0.192***	-0.060***	-0.122***	-0.094***	-0.112***
	(0.018)	(0.011)	(0.025)	(0.014)	(0.018)
Sector (Services=1)	0.009**	0.011***	0.016**	0.010***	0.017***
	(0.004)	(0.003)	(0.007)	(0.003)	(0.006)
Contract (Temporary=1)	-0.010**	-0.007**	0.003	-0.006*	-0.007
	(0.004)	(0.004)	(0.004)	(0.003)	(0.006)
Settlement (Urban=1)	-0.002*	-0.005**	-0.006	-0.001	-0.008**
	(0.001)	(0.002)	(0.004)	(0.002)	(0.003)
Regions	-0.002	0.004	-0.006	0.000	0.001
	(0.003)	(0.004)	(0.006)	(0.004)	(0.004)
Sample size	*1,869*	*2,062*	*608*	*1,793*	*1,530*

*Notes: Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1*

Table A6: Blinder-Oaxaca decomposition by education level

	Education level		
	Primary or lower	Secondary	Tertiary
Age	0.010	-0.004	-0.000
	(0.025)	(0.009)	(0.017)
Work History (years)	-0.035	-0.019*	-0.031**
	(0.022)	(0.010)	(0.015)
Female	0.003	0.011***	0.006*
	(0.007)	(0.004)	(0.004)
Occupation (ISCO 1-digit)	-0.030	-0.048***	-0.100***
	(0.023)	(0.008)	(0.015)
Sector (Services=1)	0.030**	0.010***	0.001
	(0.013)	(0.003)	(0.004)
Contract (Temporary=1)	-0.003	-0.008**	-0.004
	(0.007)	(0.004)	(0.003)
Settlement (Urban=1)	0.001	-0.003	0.003
	(0.002)	(0.002)	(0.003)
Regions	-0.017*	-0.001	0.017***
	(0.010)	(0.003)	(0.006)
Sample size	*608*	*1,793*	*1,530*

*Notes: Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1*