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The gap between public and private wages: new evidence for the EU*

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Abstract

This paper aims to assess the size of the wage gap between the public and private sectors within European Union countries by using the European Structure of Earnings Survey (SES henceforth), compiled by Eurostat for the years 2006 and 2010. Public sector employees are found to enjoy on average higher wages than comparable workers in the private sector in 2010, even after controlling for the level of educational attainment. Regarding gender, contrary to other empirical papers, for the countries with full public sector coverage, we do not find evidence of a higher positive wage gap for women. On average the public wage premium is higher for older workers and workers with lower levels of education. Finally, negative public wage premia are found for workers at higher positions, whereas the positive and sometimes large overall public wage gaps are mainly explained by the sizeable gaps observed at lower job positions.

***JEL Classification*:** J31, J45, O52.
***Keywords*:** Public wage gap; wage premium; public/private sector.

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1. Introduction

In the current context of subdued economic growth, European governments have engaged in an unprecedented effort to consolidate public finances and strengthen their budgetary positions. In view of the magnitude of the required adjustments and the need for lasting and credible consolidation strategies, most EU Member States have, in line with the Commission's recommendations on growth-friendly consolidation, prioritized expenditure-based consolidation programmes, with contributions from the revenue side being less sizeable,. This has led a number of Member States to consider putting personnel expenditures under stricter control. Indeed, achieving a large fiscal consolidation effort without reducing the public wage bill will be difficult given that it accounts for a sizable share of total public expenditure. Moreover, cuts in public wages tend to be considered less detrimental for growth than other government expenditure items (e.g. public investment that impacts the productivity of the economy).

Reducing the public wage bill can be reached via cuts in wages or downsizing the work force. The appropriate choice, however, between the two instruments depends on many considerations. These considerations involve the relative wage prevailing in the public sector, the productivity of public workers, the number of areas in which the public sector is active, labour organization and adaptability to public demands, and the need to ensure the quality of public services which requires retaining high-quality workers in the public sector. Moreover, in order to assess whether cuts in public personnel expenditures are justified, one has to consider whether wages are substantially higher in the public than in the private sector when taking into account productivity.

The purpose of this paper is to assess the size of the wage gap between the public and private sectors in the European Union countries, i.e. one of the two elements allowing a justification of the choice of reducing wages in the public sector. Clearly a high wage gap raises the possibility that a reduction in the public wage bill would be accomplished mainly via wage cuts; however such a conclusion should not be drawn unless it is accompanied by a thorough assessment of productivity differentials in both sectors.

This paper relies on the European Structure of Earnings Survey (SES henceforth), compiled by Eurostat for the years 2006 and 2010. A first level of analysis is to consider the wage difference between both sectors in absolute terms. However, it is a well-established result in the literature that public sector employees are, on average, older, more educated and more likely to take managerial positions than private sector ones, and thus tend to enjoy a higher wage level because their characteristics normally bring a higher-than-average wage. A more accurate measurement of the wage gap calls for controlling for individual characteristics such as age, gender, and educational attainment. Relatively high per-capita wages in the public sector, if not justified by differences in labour skills or occupational position, may entail inefficiencies on several fronts.

The main finding of the paper is that in 2010 public sector employees in the EU enjoyed on average higher wages than their counterparts in the private sector. This result is observed in

the majority of the countries analysed, with exceptions seen in many eastern European and Nordic countries as well as France. A higher wage premium is found for women in "old" member states only. In line with the literature, the public wage premium is, in general, higher for workers with lower levels of education and, correspondingly, negative public wage premia are found for workers at higher positions, whereas the positive and sometimes large overall public wage gaps are mainly explained by the sizeable gaps observed at lower job positions. A caveat concerning the reading of the result is warranted: the data refer to 2010, and thus do not take into account either the evolution of private wages or the reduction in personnel expenditure undertaken in the last two years, when the bulk of fiscal consolidation took place (see European Commission, 2013).

The rest of the paper is organized as follows: the next section reviews the main results in the literature; section 3 describes the sample; section 4 presents the econometric results for 2010 and section 5 compares the estimates of the wage gap between 2006 and 2010; section 6 summarizes the main conclusions. Finally, Annex I provides country fiches to provide a unified view of the results in each country.

2. Literature review

There is a large volume of literature that analyses the public-private wage gap using micro-data for a single EU country[1]. Most of these studies conclude that there exists a significant pay differential between both sectors: Rees and Shah (1995) find that civil servants in the UK earn more than comparable workers in the private sector, as do Comi et al. (2002) for Italy, Papapetrou (2006) for Greece, Foley and O'Callaghan (2009) for Ireland and Campos and Pereira (2009) for Portugal.

Moreover, this public wage premium is generally found to be higher for women than for men, and higher at the lower end of the income distribution. Indeed, Dustman and Van Soest (1997) report that wages in Germany – conditional on education, marital status and age – are actually higher in the public sector for women but higher in the private sector for men, while Melly (2005) suggests that the public wage premium is highest at the bottom of the income distribution. In the UK, Chatterji et al. (2010) report that the public-private wage gap for male employees is less than half of that for women. Comi et al. (2002) show that the Italian public wage premium is higher for women and low income workers, in line with previous results obtained by Bardasi (1996). Papapetrou (2003, 2006) reach similar conclusions for Greece, Foley and O'Callaghan (2009) for Ireland, Campos and Pereira (2009) for Portugal.

However, few studies have examined the public-private wage gap in an international perspective, partly because of the difficulty to obtain homogeneous cross-country data. Meurs and Ponthieu (2004) focused on the gender public wage gap in 10 EU countries[2] and found

[1] For a comprehensive review of the literature on public-private wage gap in euro area countries, see Giordano et al. (2011).

[2] Austria, Denmark, France, Germany, Greece, Ireland, Italy, Portugal, Spain and the United Kingdom.

that the public sector in general appears more favourable to women relative to men. Comparing public-private wage differentials in Italy and Germany, Brunello and Dustman (1997) found a positive gap in both countries, though higher in Italy (21%) than in Germany (7%).

In a more recent study, Lucifora and Meurs (2006) examined the public-private pay determination for France, Great Britain and Italy using National Survey data with non-parametric and quantile regression methods. In line with previous "national" studies, they found that the premium is higher for female public sector employees, and that low-skilled workers receive higher wages in the public sector than their private sector counterparts while the opposite is true for high-skilled workers. Comparing results across countries, they suggest that the public sector pay gap is smaller in countries where pay formation is more regulated (as in France and Italy) while it is larger in countries where market factors play a larger role in pay determination (as in Great Britain). Lucifora and Ghinetti (2013) show that the pay premium for public sector wages in the same three countries is positive at different quantiles of the wage distributions but varies in the skill distribution.

Finally, Giordano et al. (2011) investigate the public-private wage differentials in ten euro area countries[3] using micro-data taken from the EU-SILC database and pooled OLS techniques with dummy variables. Their results also point to a conditional pay differential in favour of the public sector that is generally higher for women, for workers at the low end of the wage distribution and workers in the education and public administration sectors rather than in the health sector. Notable differences emerge across countries, with Greece, Ireland, Italy, Portugal and Spain exhibiting higher public sector premiums than other countries.

3. Presentation of SES data

3.1. The sample

We base our analysis on the European Structure of Earnings Survey (SES henceforth), compiled by Eurostat, for the years 2006 and 2010 (referring to these same years). For each country and year, the dataset contains average hourly earnings[4] in Euros for the individuals that share a set of common characteristics. These characteristics are gender, age group, educational attainment, ownership of the firm/institution, NACE sector group, type of contract and job position. In order to preserve confidentiality, only entries of companies with 10 employees or more have been provided. The SES offers information for all EU-27 Member States. Sweden is excluded from the general analysis because it did not provide information on the type of contract, which limits comparability with other countries; separate regression results for Sweden are therefore presented in Annex I along with other country

[3] Austria, Belgium, France, Germany, Greece, Ireland, Italy, Portugal, Slovenia and Spain.

[4] Hourly earnings do not included 13th/14th month payment, bonuses or other annual payments in kind, which are captured and included in the annual earnings; gross hourly earnings refer to the contracted gross hourly earnings.

results (see table 10). The dataset also contains the sample weights provided by the SES that make it comparable to the overall population.

The age groups considered in the sample are young workers (between 15 and 29 years of age), middle-age workers (between 30 and 49) and older workers (50 years old or more). Educational attainment has also been grouped into three categories based on UNESCO International Standard Classification of Education. The first category, "lower education," comprises workers with primary and lower secondary education (ISCED codes 0, 1 and 2); the second category, "middle education," includes workers with upper secondary and post-secondary non-tertiary education (ISCED codes 3 and 4); the final category, "high education" ,comprises workers with first and second stage tertiary education (ISCED codes 5 and 6). Job positions are grouped according to the International Standard Classification of Occupations (ISCO). Nine major groups are considered in the sample: managers, professionals, technicians and associate professionals ("technicians" henceforth), clerical support workers ("clerical workers" henceforth), service and sales workers ("salesmen" henceforth), skilled agricultural, forestry and fishery workers ("agriculture" henceforth), craft and related trades workers ("craft" henceforth), plant and machine operators and assemblers ("plant" henceforth) and elementary occupations ("elementary" henceforth). Only partial data is available for agriculture, forestry and fishery workers as it was optional in the SES. This is also the case of "armed forces occupations", for which only Denmark, Estonia, Finland, Hungary, Lithuania and the Netherlands offer information for 2006 and only Slovenia and Hungary for 2010.

The NACE classification has been revised between 2006 and 2010. For the purpose of the analysis, NACE codes have been grouped into three broad categories. The first comprises mining, manufacturing, industry and construction (henceforth referred to as "industry"). The second consists of wholesale and retail trade and accommodation and food services activities. These activities have been assigned to a separate category as they are usually deemed to have very different productivity and on average appear to require lower skills than other services. Therefore, some different wage developments might be expected compared to other sectors. The third group consists of the rest of services, including public administration, defence and compulsory social security when provided. Indeed, it is important to note that the provision of data on the NACE sector "public administration, defence and compulsory social security" is optional and is not available in the sample for Austria, Belgium, Greece, Italy, Luxembourg, Malta and Portugal in any of the two years, whereas in Germany, Spain, France and Greece it is only available for 2010. When this NACE sector is absent, the analysis is conducted for the other service sectors, which in any case comprise Health and Education services (on top of more usual industry, construction and service sectors.)

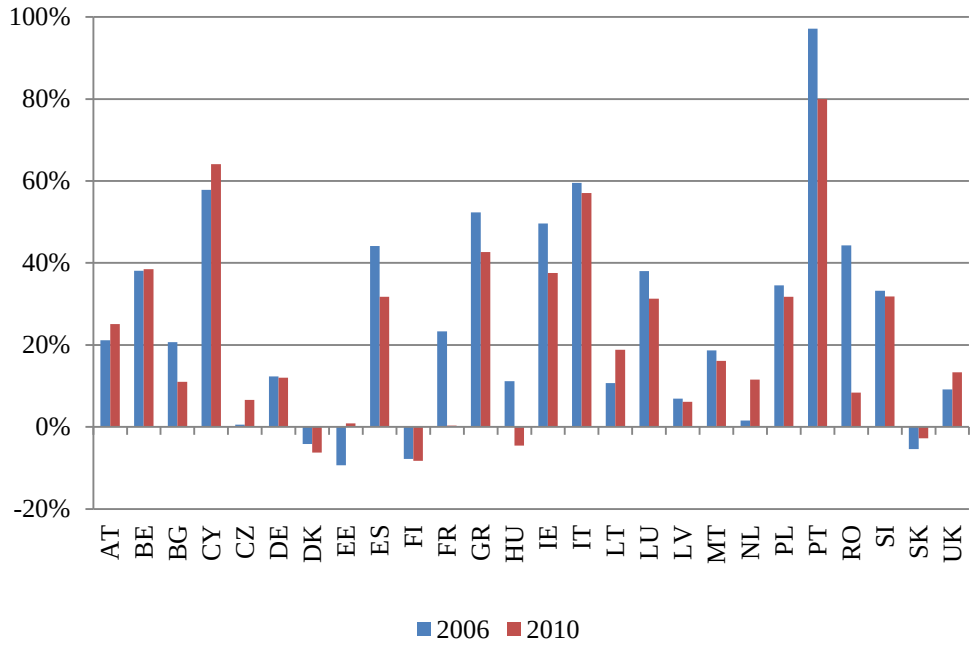
The advantage of SES compared to other micro-based datasets is that it contains direct information on whether employees work for the private or the public sector, thus negating the need to deduce this information from the NACE code. As for the ownership of the firm, two types are distinguished: public and private. This distinction is key since our assessment of the gap between public and private wages will consider as public wages the reported earnings in

both public administrations and public-owned entities. Workers employed by companies with more than 50% general government ownership are considered as working in the public sector.

Three types of contracts are considered in the dataset, namely permanent, fixed-term and apprentice. Finally, the dataset also contains the number of workers representative of the entire population of the country for each set of characteristics over which the average hourly earnings has been gauged.

Figure 1 shows that average hourly earnings in the public sector in the dataset considered appear to be higher than in private companies in most Member States in both years. The only exceptions are Denmark, Finland, Slovakia (where the hourly earnings in the private sector seem to be higher in both years), Estonia (lower public wages in 2006) and Hungary (lower public wages in 2010). These conclusions are consistent with the findings in Rees and Shah (1995), Comi et al. (2002), Papapetrou (2006), Foley and O'Callaghan (2009) and Campos and Pereira (2009). The wage premium appears strikingly sizeable in Portugal (where public wages appear to be almost double that of private wages in 2006), Cyprus and Italy (in both cases around 60%) and to a somewhat lower extent in Belgium, Spain, Ireland, Luxembourg, Poland, Romania and Slovenia, broadly in line with the findings in Brunello and Dustman (1997) and Giordano et al. (2011).

Figure 1: Average wage differences between the public and the private sector in the EU (% of hourly earnings in the private sector)



Between 2006 and 2010, the difference has narrowed significantly in Bulgaria, Spain, Greece, Ireland, Portugal and Romania and to a lesser extent in Italy, Luxembourg, Malta, Poland and Slovenia. The decrease of the wage differential observed in the former group of countries is consistent with the wage cuts implemented in public administrations to help reduce very high public deficits and debt.

In general, the public wage differential in the public sector is higher for women (see Figure 2), with the only exceptions being Bulgaria, Greece and Hungary. This evidence is in line with earlier findings in the literature[5]. The gender gap is most sizeable in Belgium, Cyprus and Poland. No significant differences regarding this general pattern can be detected between the two years of the SES.

By educational attainment, significant differences across countries are observed. In general, the public sector wage difference tends to be larger for workers with primary and secondary education, which, in turn, tends to coincide with lower skilled workers. However, the wage difference for workers with higher education in the public sector in 2006 appears to be higher than for lower skilled employees in Cyprus, Ireland, Belgium, Spain, Greece and Italy, although it should be noted that no data are available for the latter four countries for the NACE sectors "public administration, defence and compulsory social security", which could potentially bias the figures. This pattern remains broadly unchanged in 2010 except in Spain, where the progressive wage cut of May 2010 seems to have most affected workers with higher skills, thus making their wage premium lower than in the case of other less-skilled employees. In any case, the comparison for Spain should be read with attention as 2010 does contain the NACE sector "public administration, defence and compulsory social security".

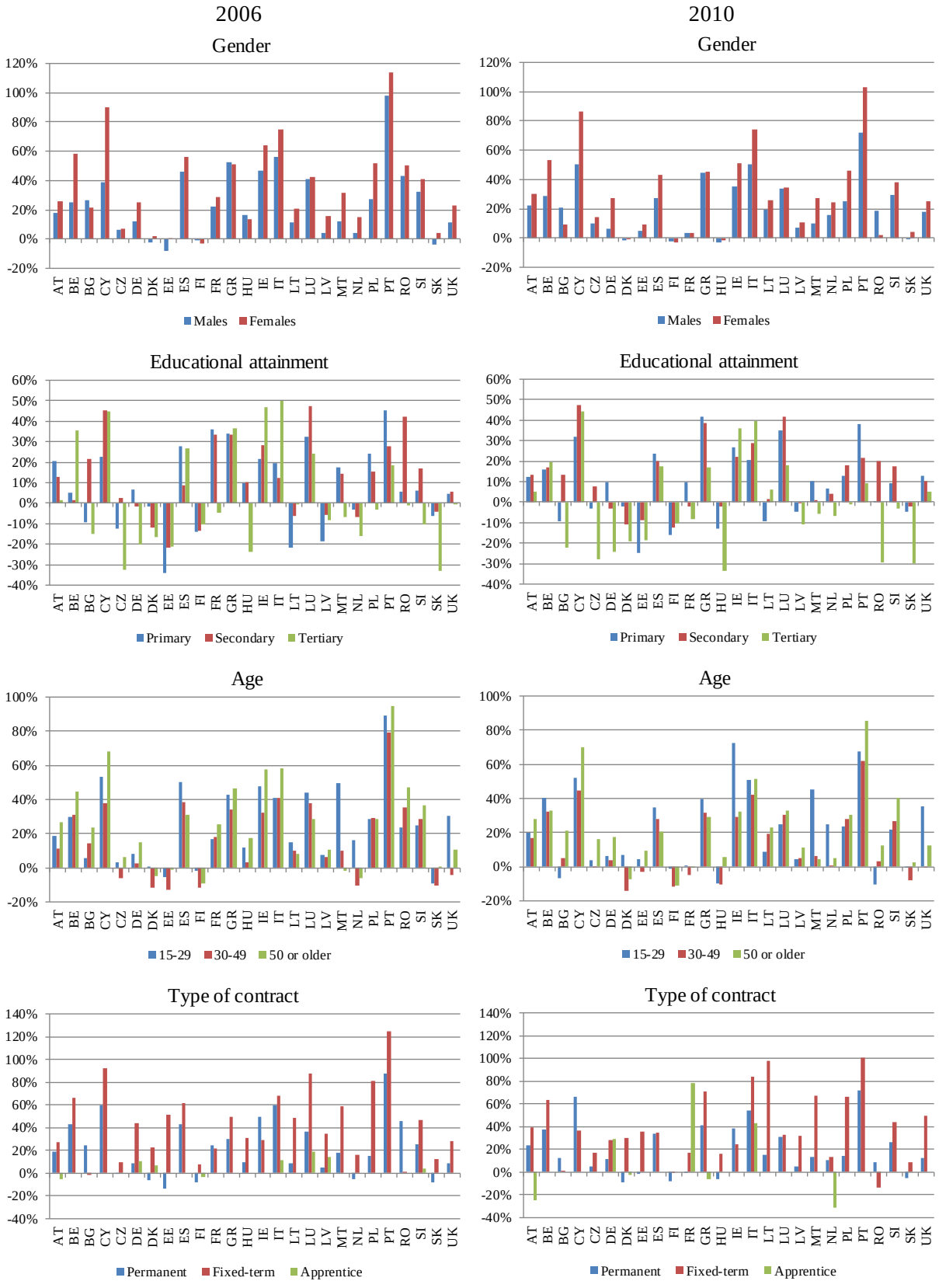
By contrast, the public wage difference for employees with higher educational attainment is negative, especially when compared to workers with primary and secondary education, in Bulgaria, the Czech Republic, Germany, Hungary, Slovakia and, to a lesser extent, the Netherlands. The most salient difference between 2006 and 2010 is observed in Romania; in 2006 the wage premium for workers with high education levels was around zero, whereas it becomes very negative (around -30%) in 2010. The German figures have to be taken with care too, as data for "public administration, defence and compulsory social security" are not available for 2006.

Regarding educational attainment, the evidence shown in Figure 2 is in contradiction with the results in Lucifora and Meurs (2006) in that although the wage difference for lower-skilled workers seems to be higher in the United Kingdom, our data suggest that workers with high levels of education are in any case better paid in the public sector than their private sector counterparts. This difference could be due to the fact that in the present paper public sector workers are explicitly identified and not implicitly via the NACE codes.

The wage premium for older workers in the public sector is on average higher than for younger employees. However, clear exceptions to this pattern appear in Spain, Malta, the Netherlands and the UK. In Ireland a rapid change is observed between 2006 and 2010; the higher public wage differences for older workers in 2006 reduces significantly in 2010, when a marked relative improvement for workers with the lowest levels of education is detected.

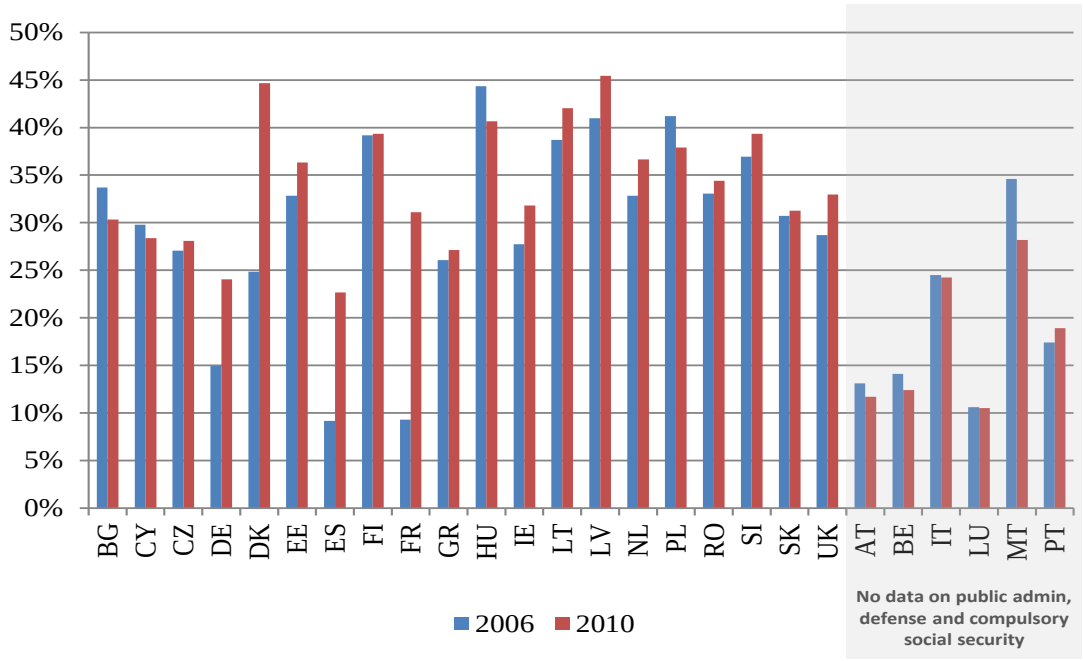
[5] Specifically, Dustman and Van Soest (1997) for Germany, Comi et al. (2002) and Bardasi (1996) for Italy, Foley and O'Callaghan (2009) for Ireland, Campos and Pereira (2009) for Portugal, Lucifora and Meurs (2006) France, Great Britain and Italy and Giordano et al. (2011).

Figure 2: Average wage differences between the public and the private sector by individual characteristic (% of hourly earnings in the private sector)



Higher public wages are observed in almost all cases in the three types of contracts. In 2006, the premium is significantly higher in the case of fixed-term contracts. In particular, wages for temporary workers in the public sector are 60% higher or more than in the private sector in Belgium, Cyprus, Spain, Italy, Luxembourg, Poland and Portugal. However, some noticeable changes are observed in 2010. While public wages seem to remain higher on average in the public sector, this premium decreases in particular in the case of fixed term contracts. In Cyprus, the gap for fix-term contracts becomes lower than for permanent workers, while in Spain and Luxembourg the premium becomes very similar in both types of contracts.

Figure 3: Share of employees in the public sector (% of total of SES dataset)



Note: the dataset does not cover agriculture and micro enterprises, which tends to inflate the share of public employees and makes the comparison of these shares among countries not readable.

Figure 3 shows the percentage of workers employed in the public sector in each EU country in the SES. Large disparities are observed across Member States. In most cases, public employment exceeds 25% of total workers in the sample. It should be borne in mind that the exclusion of small enterprises and of the agricultural sector tends to inflate the share of public employment in the sample, which might also have some impact on the size of the wage gap. In this respect the SES data are not fully comparable to those from other data sources. The lowest shares of public employment are observed in Germany and Spain, with less than 25% in 2010. Austria, Belgium, Italy, Luxembourg and Portugal also show low levels of public employment, though these figures are not representative of the entire population because the sample does not contain information available for "public administration, defence and compulsory social security". The same holds for France in 2006. In Denmark, the share of public employment increases sharply in 2010.

3.2. The characteristics of public sector workers

Figure 4 shows the share of employees in the public sector out of total employment by individual characteristic. In almost all cases, the share of female workers in the public sector out of total female employees is higher than in the case of their male counterparts. In the same vein the share of highly-educated workers in the public sector is very high, implying that, in general, the public workers tend to have a higher level of education than in the private sector. In all countries, the relative presence of workers with tertiary education clearly outweighs the proportion of workers with lower skills in the public sector.

Tenure in the public sector appears longer as the relative presence of workers therein increases with age. Again, as in the cases of gender and educational attainment, this feature is a general pattern.

By type of contract, the share of temporary workers in the public sector out of total temporary workers is in most cases higher than the equivalent share of permanent workers. Conversely, apprentice contracts appear to be barely used in public entities.

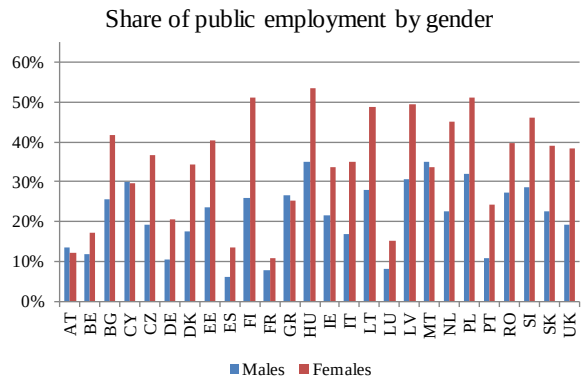
Figure 5 offers complementary information on employment distribution by sector. Female employment predominates in the public sector in most countries, whereas males are the majority in all cases in private companies. Regarding educational attainment, public sector employment is clearly biased towards high levels of education. The proportion of workers with tertiary education in the public sector outweighs that in private firms in all cases, whereas in the latter workers with secondary education are predominant. This fact is closely linked to the different types of activities and therefore the work requirements: a large share of public employment concentrates on health care and education, for which tertiary education and a certain degree of technical specialization is needed. The same applies to medium to high level staff employees in public administrations.

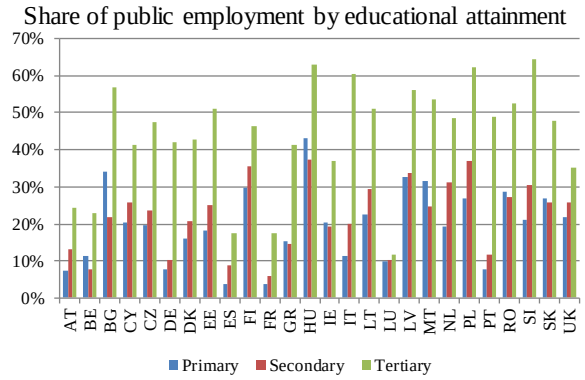
Public employees tend to be older on average. Older workers amount to around 20% of private employment, a share that almost doubles on average in the public sector. Middle-aged employees represent around 40% of total employment in both sectors. However, the presence of young workers is relatively more important in the private sector. In fact, this result is closely related to educational attainment. As public sector employees have, on average, higher education, they tend to enter the labour market later.

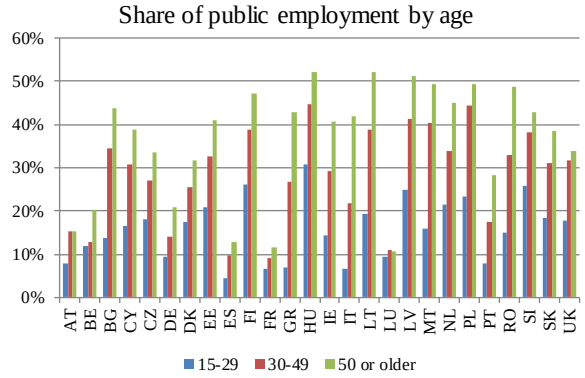
Finally, permanent contracts are predominant in all cases, although two cases deserve special mention. In Belgium and Spain the share of temporary contracts in the public sector exceeded 30% in 2006. In 2010, however, this proportion declined to below 10% in Belgium, whereas in Spain, while still very sizeable, the share of fixed-term contracts fell by almost 10 percentage points. However, the employment composition does not show significant differences between 2006 and 2010, while changes between the two years appear somewhat more salient in remuneration.

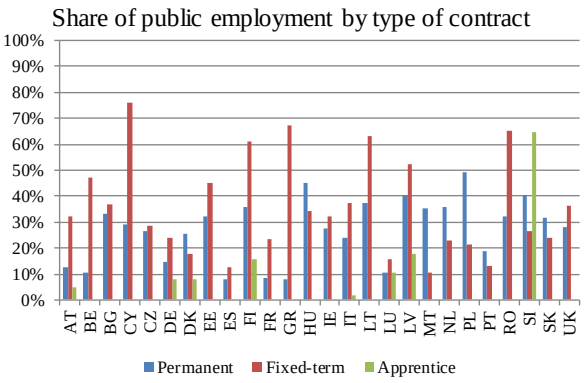
Figure 4: Share of public employment by individual characteristic (% of total employment by characteristic)

2006

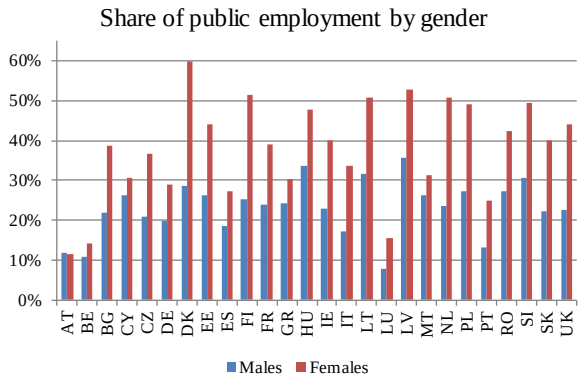


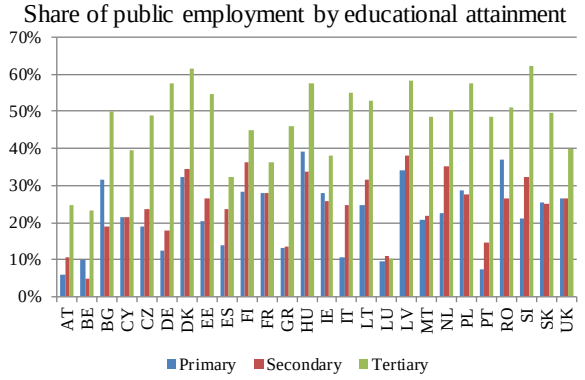


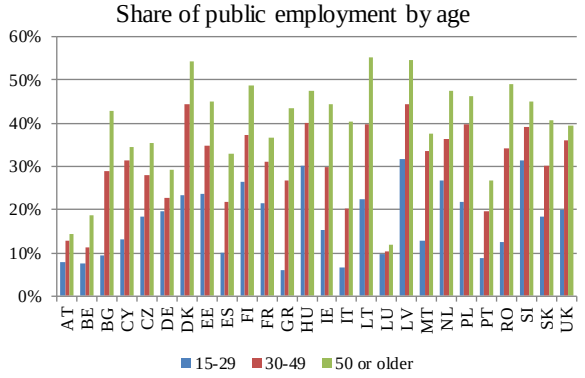




2010







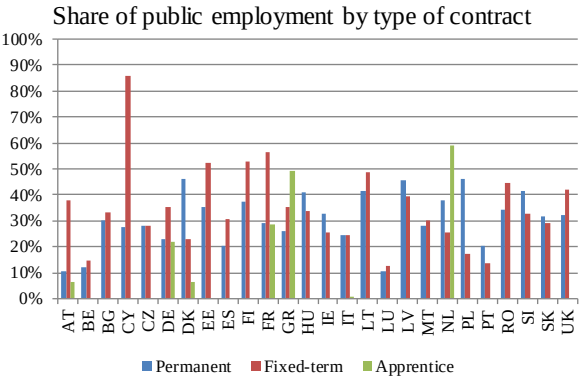


Figure 5: Breakdown of employment in the public and private sectors (% of total)

4. Econometric results for 2010

We estimate wage equations with average hourly earnings in natural logs as the dependent variable. The explanatory variables are dummies that refer to the different characteristics as determinants of the earnings scheme such as public vs. private sector, gender, the educational attainment, age group, sector of activity according to NACE codes (see section 3), type of contract and type of job according to ISCO codes except "armed forces" that has been excluded from the analysis. In particular, we take as the reference category a male, working in the private sector, between 30 and 49 years of age, with middle (secondary education) and on a permanent contract as a technician. Firstly, we estimate the following wage equation:

$$w_i = \alpha + \beta \cdot sector_i + \gamma X'_i + \varepsilon_i \quad (1)$$

where the variable sector takes the value of one if the employee works in the public sector and zero otherwise. As the dependent variable enters in logs, the coefficient β can be interpreted as the percentage wage premium in the public sector. This equation is estimated by pooled OLS techniques, with country fixed effects (taking Slovenia as the reference country) and using sample weights provided by the SES to make the sample comparable to the total population. Standard errors are robust to heteroskedasticity.

Given that information on the NACE sector "public administration, defence and compulsory social security" in Germany, Spain, France and Greece is only available for 2010, the analysis focuses on assessing the wage gap observed for that year. In order to ensure comparability, Table 1 presents theses results for the pool of countries for which all NACE sectors are available.

On average, there is a positive and significant wage premium in the public sector once we control for other characteristics, amounting to 3.6%. The rest of the controls yield the expected signs, namely, females (gender coefficient), young workers, low educational levels, apprentice and fixed-term contracts, wholesale, retail and food services, and workers at ISCO job categories below technicians at their respective firms receive lower salaries. By contrast, older workers, high educational attainment and those working in industry sector enjoy higher remuneration. All the coefficients are significant at conventional levels.

A first assessment of the public-private sector wage gap by country is made based on the Blinder-Oaxaca decomposition (Blinder, 1973; Oaxaca, 1973). This decomposition is given by (see Annex II for technical details):

$$\bar{w}^{pub} - \bar{w}^{priv} = \left(\bar{X}_i^{pub} - \bar{X}_i^{priv}\right)\beta^* + \left[\bar{X}_i^{pub}\left(\beta^{pub} - \beta^*\right) + \bar{X}_i^{priv}\left(\beta^* - \beta^{priv}\right)\right] \quad (2)$$

where $\bar{w}^{pub}$ and $\bar{w}^{priv}$ are the average values of hourly earnings in the public and the private sector, $\bar{X}_i^{pub}$ and $\bar{X}_i^{priv}$ are the vectors with the average characteristics for workers in the two sectors and β^{pub} and β^{priv} are the OLS estimates of the relevant coefficients for each subsample. In turn, β^* is a non-discriminatory coefficient structure obtained from the pooled regression for the public and the private sector.

Table 1: Pooled regression

Variable	Coefficient	Standard Error	t-statistic
Sector	0.036	0.012	3.0
Gender	-0.174	0.009	-19.6
Young	-0.207	0.009	-21.8
Old	0.045	0.010	4.5
Low education	-0.101	0.009	-10.9
High education	0.168	0.013	12.6
Apprentice	-0.898	0.032	-27.6
Fixed-term contract	-0.141	0.009	-16.5
Industry	0.049	0.010	5.0
Service 1	-0.092	0.013	-7.3
Manager	0.442	0.019	22.8
Professional	0.014	13.520	0.0
Clerical	-0.204	0.010	-20.0
Sales	-0.287	0.016	-17.9
Agriculture	-0.448	0.014	-32.8
Craft	-0.256	0.013	-19.1
Plant	-0.288	0.015	-19.2
Elementary	-0.402	0.020	-20.4
Fixed effects			
BG	-1.531	0.020	-75.6
CY	0.259	0.021	12.1
CZ	-0.536	0.013	-40.2
DE	0.709	0.015	48.7
DK	1.046	0.032	33.1
EE	-0.680	0.019	-35.0
ES	0.305	0.012	24.6
FI	0.668	0.015	45.6
FR	0.545	0.013	43.1
GR	0.166	0.016	10.4
HU	-0.759	0.018	-41.7
IE	0.812	0.017	48.6
LT	-1.087	0.017	-65.4
LV	-0.931	0.016	-56.7
NL	0.658	0.013	49.0
PL	-0.649	0.021	-31.7
RO	-1.320	0.021	-63.6
SK	-0.654	0.015	-44.0
UK	0.497	0.015	32.3
Constant	2.338	0.017	138.4
No. Obs.	22784[6]		
R^2	94.2%		

[6] This figure refers to the number of observations in the aggregated data file; the corresponding number of individuals surveyed across countries is 107,781,401. The total number of employees included in the sample for the year 2010 (number of observations in the aggregated data file in parenthesis) is 2,323,366 for AT (947); 2,272,068 for BE (677); 1,805,678 for BG (1031); 212,228 for CY (462); 3,453,693 for CZ (1652); 24,206,227 for DE (1663); 2,542,732 for DK (1765); 381,607 for EE (785); 9,328,311 for ES (1218); 1,457,067 for FI (1438); 17,797,812 for FR (1353); 1,529,739 for GR (656); 2,039,750 for HU (1228); 966,439 for IE (837); 10,400,086 for IT (1074); 930,804 for LT (610); 259,076 for LU (412); 594,203 for LV (1107); 129,766 for MT (416); 6,360,203 for NL (1170); 7,400,045 for PL (1404); 2,334,577 for PT (926); 3,967,129 for RO (823); 572,142 for SI (1204); 1,594,056 for SK (1334); 20,641,536 for UK (1044). It applies for all following regressions for the year 2010.

The first component in equation (1) $\left(\bar{X}_1^{pub} - \bar{X}_1^{priv}\right)\beta^*$ accounts for the differential that is explained by group differences in the predictors, known as the "endowments effect".

The second component $\left[\bar{X}_1^{pub}\left(\beta^{pub} - \beta^*\right) + \bar{X}_1^{priv}\left(\beta^* - \beta^{priv}\right)\right]$ is the "unexplained" part, which is in turn the sum of two terms, the public sector "advantage" and the private sector "disadvantage", which also captures all potential effects of differences in unobserved variables.

Table 2: Blinder-Oaxaca decomposition of the wage differential

	Total difference	Explained	Unexplained
BG	0.157***	0.251***	-0.093**
CY	0.509***	0.299***	0.209***
CZ	0.108***	0.156***	-0.048**
DE	0.158***	0.058**	0.1***
DK	-0.035**	0.105***	-0.14***
EE	0.021	0.171***	-0.151***
ES	0.294***	0.143***	0.151***
FI	-0.077***	-0.008	-0.069***
FR	0.026	0.063***	-0.037***
GR	0.379***	0.298***	0.082***
HU	-0.028	0.136***	-0.163***
IE	0.33***	0.118***	0.212***
LT	0.171***	0.125***	0.046
LV	0.069***	0.144***	-0.075***
NL	0.144***	0.149***	-0.005
PL	0.307***	0.243***	0.065***
RO	0.118***	0.163***	-0.046
SI	0.294***	0.239***	0.054***
SK	0.009	0.11***	-0.101***
UK	0.178***	0.191***	-0.013
AT	0.233***	0.172***	0.061***
BE	0.329***	0.212***	0.117***
IT	0.435***	0.33***	0.105***
LU	0.298***	0.094**	0.204***
MT	0.176***	0.187***	-0.011
PT	0.634***	0.515***	0.119***
EU	0.105***	0.069***	0.036***

Note: *, ** and *** indicate significance at the 10%, 5% and 1% level, respectively. The grey cells refer to the countries for which information on "public administration, defence and compulsory social security" is available.

Table 2 provides the decomposition based on equation (2). Except for the public sector dummy variable, the explanatory variables in the wage equations are the same ones as in equation (2) using the SES sample weights and robust standard errors. It is worth noting that the results for Austria, Belgium, Italy, Luxembourg, Malta and Portugal might not be fully comparable with the rest of the countries, as the NACE sector "public administration, defence and compulsory social security" is not available.

Table 3: Regression results by country: whole sample and by gender

	Whole sample	Male	Female
BG	-0.093*	0.016	-0.261***
CY	0.209***	0.199***	0.186***
CZ	-0.048*	-0.027	-0.076***
DE	0.1***	0.083**	0.129***
DK	-0.14***	-0.155***	-0.123***
EE	-0.151***	-0.08**	-0.23***
ES	0.151***	0.131***	0.168***
FI	-0.069***	-0.071***	-0.066***
FR	-0.037**	-0.01	-0.054***
GR	0.082***	0.103**	0.063*
HU	-0.163***	-0.091**	-0.231***
IE	0.212***	0.195***	0.218***
LT	0.046	0.118**	-0.028
LV	-0.075***	-0.008	-0.139***
NL	-0.005	-0.059***	0.039**
PL	0.065**	0.085**	0.019
RO	-0.046	0.075	-0.237***
SI	0.054***	0.079***	0.018
SK	-0.101***	-0.047	-0.158***
UK	-0.013	-0.001	-0.017
AT	0.061***	0.067**	0.054***
BE	0.117***	0.104***	0.128***
IT	0.105***	0.059**	0.145***
LU	0.204***	0.226***	0.161***
MT	-0.011	0.002	-0.025
PT	0.119***	0.109***	0.12***
EU	0.036***	0.043***	0.029

Note: *, ** and *** indicate significance at the 10%, 5% and 1% level, respectively. The grey cells refer to the countries for which information on "public administration, defence and compulsory social security" is available.

Bearing this caveat in mind, it is worth noting that in all cases but Denmark, Finland and Romania wages are substantially higher overall in the public sector. However, the real unexplained wage gap is not so sizeable. In fact, in most EU countries the wage gap as measured by the "unexplained" component amounts to only around one-third of the total

wage difference (3.6% vs. 10.5%), as the most sizeable part can be explained by differences in the characteristics (the so-called "endowments effect"). On the other hand, in some countries the overall positive wage difference conceals a negative wage gap, i.e. Bulgaria, the Czech Republic, Latvia, Estonia, France, Romania and Slovakia.

Focusing on the unexplained part – the wage gap *per se* – hourly earnings in the public sector in 2010 are higher than in the private sector in Austria, Belgium, Cyprus, Germany, Greece, Spain, Ireland, Italy, Luxembourg, Poland, Portugal and Slovenia. In all of these cases, the public wage premium is above the EU average[7]. By contrast, workers in the private sector receive higher pay in Bulgaria, the Czech Republic, Denmark, Estonia, Finland, France, Hungary, Latvia and Slovakia, whereas in Lithuania, Malta, the Netherlands, Romania and the United Kingdom the difference between public and private wages is not significant at conventional levels.

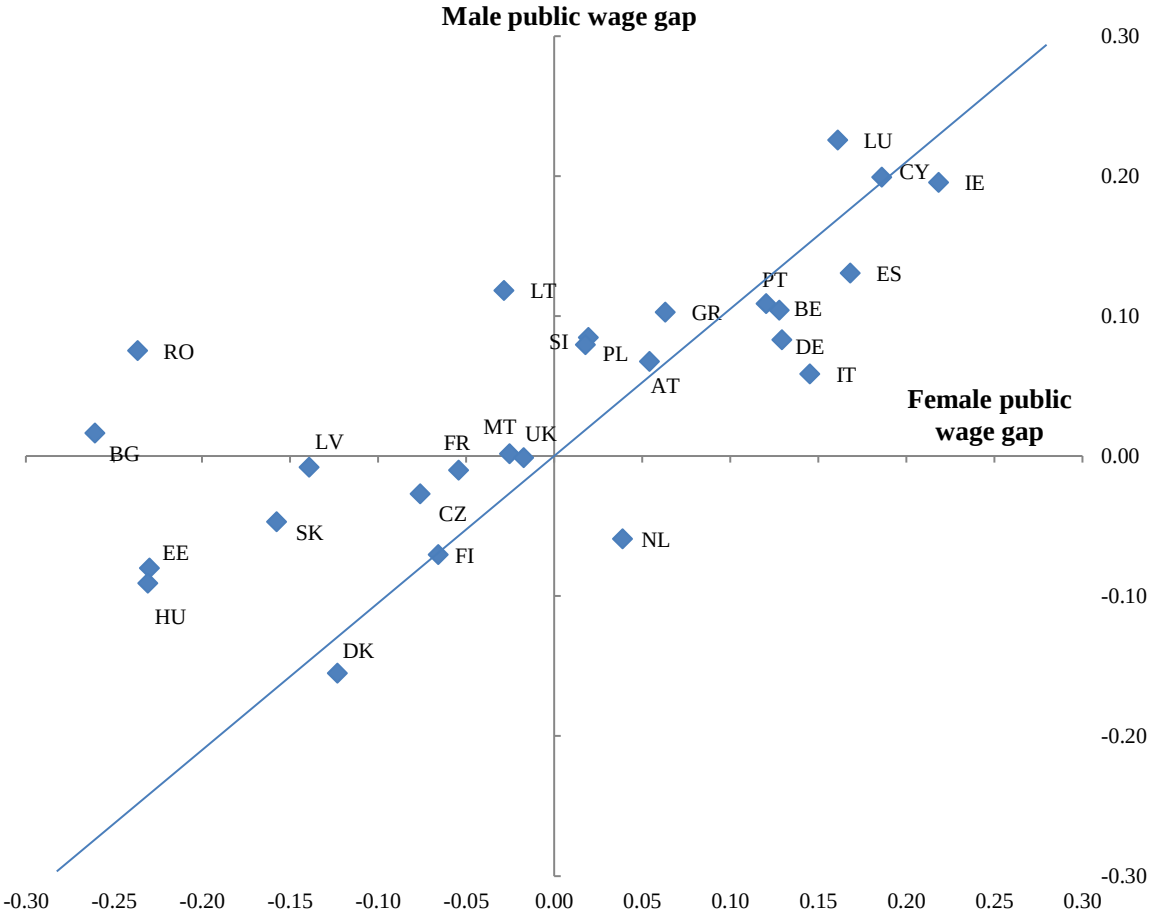
Among those countries with a positive wage gap in the public sector, hourly earnings in the public sector in 2010 are between 5% and 10% higher than in the private sector in Austria, Greece, Poland and Slovenia; the gap amounts to between 10% and 20% in Belgium, Germany, Spain, Italy and Portugal, while it is higher than 20% in Cyprus, Ireland and Luxembourg. Our estimates for Germany, Austria and Ireland are in line with the values obtained in Giordano et al. (2011), whereas our estimates for Belgium, Spain, Italy, Portugal and Slovenia are significantly lower. Our results for France are significantly different as we obtain a negative premium whereas Giordano et al. found a positive one.

Equation (1) is also estimated for several subgroups by gender, age and level of education. Table 3 shows the results from the estimation of equation (1) by country and gender for 2010, also using the SES sample weights and robust standard errors. According to the coefficients therein, women enjoy higher earnings in the public sector in Germany, Spain, Ireland, the Netherlands, Belgium, Italy and Portugal, whereas in Denmark the negative gap in the public sector is lower for women. Gender differences appear negligible in Cyprus, Finland, Malta and the United Kingdom. By contrast, males seem to be relatively better off in the remaining cases, be it because of a larger positive gap than their private sector counterparts (Greece, Lithuania, Poland, Slovenia, Luxembourg) or a smaller negative one than that of their counterparts (Czech Republic, Estonia, France, Hungary, Latvia, Romania, Slovakia). On average, for the pool of countries for which all sectors are available, a higher public wage premium for women is not found.

Figure 6 displays the relationship between the public sector wage gap for males and females. It is worth noting that, in general, more recent EU Member States tend to show a higher public wage premium for males than for females, whereas the opposite tends to be observed in countries already EU members before 2004.

[7] The EU average refers to all EU countries shaded in grey, for which the NACE sector "public administration, defence and compulsory social security" is available.

Figure 6: Public sector wage gap by gender



By age, Table 4 shows that in a first group of countries (Austria, Cyprus, Czech Republic, Germany, France, Luxembourg, Poland, Slovenia) older employees are found to enjoy a higher positive public wage gap than any of their younger counterparts. In a second group of countries where the general public wage gap is negative (Bulgaria, Estonia, Hungary, Latvia, Romania, Slovakia) older employees in the public sector are also found to be better off than younger counterparts as they have the smallest negative wage gap in the distribution. In a third group, young people (Belgium, Greece, Ireland, Netherlands, United Kingdom) or young and middle-aged people (Spain, Italy) enjoy a higher positive public wage gap than their older counterparts. Finally, in Denmark and Finland, young people are also better off since they enjoy a smaller negative wage gap than older employees. As before, the conclusions for the countries at the bottom of Table 4 have to be taken with care, as they only refer to public entities other than "public administration, defence and compulsory social security".

The pooled EU row refers to the countries for which the full public sector is covered. On average, the highest public wage premium is estimated for older workers, while young workers are also found to enjoy a positive, though lower, premium; no significant gap is obtained for middle-age workers. For those countries with full public sector coverage, the

public wages premium is above the EU average in Cyprus, Germany, Ireland and Luxembourg regardless of the age group, whereas in Belgium, Spain, Italy, the Netherlands, Portugal and the United Kingdom the premium is only above the average in the case of younger employees.

Table 4: Regressions results by country and age

	Young (15 - 29)	Middle (30 - 49)	Old (50+)
BG	-0.409***	-0.149*	0.077
CY	0.23***	0.148***	0.265***
CZ	-0.116***	-0.098**	0.069**
DK	-0.057***	-0.168***	-0.118***
DE	0.067**	0.075**	0.148***
EE	-0.189***	-0.2***	-0.059
ES	0.167***	0.179***	0.074***
FI	-0.012	-0.078***	-0.075***
FR	-0.057**	-0.037*	-0.037*
GR	0.145***	0.082**	0.002
HU	-0.225***	-0.193***	-0.083**
IE	0.364***	0.2***	0.176***
LT	-0.012	0.04	0.061
LV	-0.173***	-0.106**	0.013
NL	0.108***	-0.027*	-0.038**
PL	0.003	0.045	0.091***
RO	-0.371***	-0.038	0.059
SI	0.034*	0.049**	0.063***
SK	-0.151***	-0.136***	-0.028
UK	0.107***	-0.087	0.049**
AT	0.03	0.041	0.102***
BE	0.176***	0.099***	0.089***
IT	0.271***	0.114***	0.023
LU	0.123***	0.215***	0.222***
MT	0.052	-0.037	0.011
PT	0.139***	0.088***	0.087**
EU	0.041**	0.014	0.069***

Note: *, ** and *** indicate significance at the 10%, 5% and 1% level, respectively. The grey cells refer to the countries for which information on "public administration, defence and compulsory social security" is available.

Table 5 shows the results for the estimation by the level of educational attainment. For most of the countries surveyed, workers with a higher level of education are found to be relatively worse off than their less educated counterparts with regards to the wage premium, either because they have a negative public wage gap when their counterparts enjoy a positive or non-significant one (Bulgaria, Czech Republic, Germany, France, Latvia, Netherlands, Poland, Romania, Slovakia), or because they have a non-significant public pay gap when

their counterparts have a positive one (Greece, Slovenia) or because they have a positive public wage gap that is smaller than that of their counterparts (Spain, Luxembourg, Portugal) or because they have a larger negative pay gap than that of their counterparts (Denmark, Estonia, Hungary). Notable exceptions include Belgium, Cyprus, Ireland and Italy in which workers with high and low educational levels are both found to enjoy a higher positive wage gap than those with medium educational levels, exhibiting a U-shaped pattern, and Austria where workers with high and medium educational levels enjoy a positive public wage gap compared to less educated workers who do not. On average, it seems that the public wage premium is positive and relatively high, (some 14%) for less skilled workers and negative, in most cases, (almost -6%) for workers with tertiary education.

Table 5: Regressions results by country and educational attainment

	Low education	Medium education	High education
BG	0.126***	0.124***	-0.397***
CY	0.298***	0.166***	0.207***
CZ	0.093***	0.037	-0.301***
DE	0.245***	0.122***	-0.168***
DK	-0.073***	-0.089***	-0.207***
EE	-0.072*	-0.086**	-0.242***
ES	0.208***	0.166***	0.091***
FI	-0.11***	-0.049***	-0.082***
FR	0.064***	-0.017	-0.101***
GR	0.287***	0.149***	-0.019
HU	-0.035	-0.082**	-0.407***
IE	0.243***	0.175***	0.218***
LT	0.018	0.1**	-0.015
LV	0.008	0.004	-0.203***
NL	0.053**	0.034**	-0.097***
PL	0.162***	0.131***	-0.087**
RO	0.113**	0.17***	-0.422***
SI	0.113***	0.08***	-0.034*
SK	0.06***	-0.025	-0.284***
UK	0.035	-0.044	-0.002
AT	0.038	0.066**	0.046**
BE	0.08**	0.061***	0.134***
IT	0.159***	0.045*	0.1***
LU	0.193***	0.189***	0.216***
MT	0.023	-0.068	-0.024
PT	0.186***	0.082**	0.045**
EU	0.117***	0.065***	-0.066***

Note: *, ** and *** indicate significance at the 10%, 5% and 1% level, respectively. The grey cells refer to the countries for which information on "public administration, defence and compulsory social security" is available.

When compared with the EU average, public workers with lower skills are in a relatively better position in Cyprus, Germany, Spain, Greece, Ireland and Poland (often around 20% or above). The economic conditions of workers with a higher educational attainment are better than average in Cyprus, Spain and Ireland. As explained before, the estimates for Austria, Belgium, Italy, Luxembourg, Malta and Portugal cannot be directly compared with the rest as the NACE coverage of the public sector is not complete.

Table 6 shows the sector coefficient by gender and age category. On average, the public wage premium is higher for women in the case of young and older workers. However, the opposite is true for the middle age group, where no significant premium is estimated in the case of women. In all cases, the highest premia are observed for people older than 50.

Table 6: Regressions results by country, age and gender

	Young (15 - 29)		Middle (30 - 49)		Old (50+)	
	Male	**Female**	**Male**	**Female**	**Male**	**Female**
BG	-0.26**	-0.568***	-0.005	-0.318***	0.11**	-0.067
CY	0.182***	0.232***	0.155***	0.108	0.25***	0.264***
CZ	-0.081	-0.148***	-0.095	-0.111***	0.095**	0.018
DE	0.044	0.088**	0.066	0.094**	0.122*	0.194***
DK	-0.038	-0.072***	-0.194***	-0.146***	-0.139***	-0.094***
EE	-0.148**	-0.234***	-0.141**	-0.27***	0.037	-0.159***
ES	0.141***	0.172***	0.181***	0.169***	0.023	0.134***
FI	-0.012	-0.011	-0.079***	-0.076***	-0.078***	-0.071***
FR	-0.088*	-0.04	0.001	-0.06***	-0.02	-0.046**
GR	0.138*	0.144***	0.114*	0.061*	0.037	-0.072
HU	-0.156***	-0.299***	-0.109	-0.272***	-0.027	-0.134***
IE	0.475***	0.319***	0.182***	0.205***	0.143***	0.2***
LT	0.052	-0.082	0.121*	-0.049	0.119*	-0.012
LV	-0.149***	-0.195***	-0.032	-0.177***	0.087**	-0.059**
NL	0.064***	0.136***	-0.076***	0.004	-0.081***	0.022
PL	0.042	-0.042	0.065	-0.002	0.104***	0.054*
RO	-0.207*	-0.511***	0.09	-0.235**	0.122	-0.099
SI	0.058**	-0.005	0.081***	0.003	0.064**	0.069**
SK	-0.065	-0.217***	-0.086	-0.184***	0.008	-0.084***
UK	0.094***	0.109***	-0.043	-0.127	0.003	0.081***
AT	-0.015	0.075**	0.049	0.037	0.123**	0.063*
BE	0.127***	0.2***	0.088***	0.106***	0.08***	0.104***
IT	0.227***	0.303***	0.066**	0.145***	-0.02	0.068
LU	0.121***	0.114***	0.229***	0.179***	0.244***	0.165***
MT	0.119**	0.001	-0.029	-0.043	0.028	-0.036
PT	0.081	0.176***	0.096**	0.073***	0.07	0.103**
EU	0.028	0.048**	0.034	-0.006	0.06**	0.078***

Note: *, ** and *** indicate significance at the 10%, 5% and 1% level, respectively. The grey cells refer to the countries for which information on "public administration, defence and compulsory social security" is available.

In general, compared with the private sector, public wages are higher in Belgium, Cyprus, Spain, Ireland and Luxembourg regardless of the gender and age group. In Germany public wages tend to be higher mainly for women, whereas in Spain and Italy the higher gap mainly applies to young or middle-aged workers.

In any case, drawing general conclusions is a challenging task as there is much disparity across countries. Nevertheless, generally speaking, the public wage premium appears higher for workers with lower levels of education. Moreover, the premium tends to be higher for women than for men in countries already EU members before 2004, whereas for more recent Member Sates the opposite result is usually found.

Table 7: Regressions results by country, educational attainment and gender

	Low education		Medium education		High education	
	Male	**Female**	**Male**	**Female**	**Male**	**Female**
BG	0.104**	0.037	0.185***	-0.044	-0.284***	-0.473***
CY	0.293***	0.326***	0.191***	0.108	0.171***	0.237***
CZ	0.104**	0.075***	0.092**	-0.026	-0.327***	-0.268***
DE	0.242***	0.24***	0.118***	0.13***	-0.215***	-0.079***
DK	-0.084***	-0.064***	-0.111***	-0.082***	-0.222***	-0.192***
EE	-0.017	-0.179***	0.015	-0.209***	-0.233***	-0.252***
ES	0.201***	0.217***	0.136**	0.191***	0.051**	0.119***
FI	-0.146***	-0.072***	-0.057***	-0.041***	-0.069***	-0.089***
FR	0.114***	0.01	0.01	-0.042**	-0.108***	-0.097***
GR	0.38***	0.122***	0.182**	0.101*	-0.061	0.02
HU	0.003	-0.073*	-0.001	-0.189***	-0.388***	-0.412***
IE	0.22***	0.275***	0.158***	0.183***	0.205***	0.218***
LT	0.057	-0.002	0.198***	-0.063*	-0.01	-0.016
LV	0.029	-0.04	0.081*	-0.087***	-0.199***	-0.202***
NL	-0.038*	0.134***	-0.031*	0.074***	-0.119***	-0.08***
PL	0.186***	0.117***	0.178***	0.033	-0.159***	-0.034
RO	0.158***	-0.001	0.249***	-0.002	-0.339***	-0.489***
SI	0.104***	0.144***	0.105***	0.026	-0.026	-0.042*
SK	0.136***	-0.003	0.043	-0.103***	-0.286***	-0.278***
UK	0.035	0.046*	0.027	-0.092	-0.035	0.022
AT	0.04	0.048	0.084**	0.042	0.03	0.07***
BE	0.092***	0.075**	0.095***	0.01	0.097***	0.164***
IT	0.115***	0.197***	-0.011	0.097***	0.049	0.15***
LU	0.218***	0.169***	0.257***	0.102**	0.181***	0.256***
MT	0.009	0.081	0.007	-0.136**	-0.023	-0.034
PT	0.23***	0.152***	0.09**	0.093**	-0.004	0.073***
EU	0.131***	0.107***	0.09***	0.036	-0.09***	-0.045**

Note: *, ** and *** indicate significance at the 10%, 5% and 1% level, respectively. The grey cells refer to the countries for which information on "public administration, defence and compulsory social security" is available.

When considering gender and educational attainment simultaneously, only women with tertiary education seem to enjoy, on average, a better economic position in the public sector when compared with their male colleagues. In this case, private wages for both men and women seem to be higher, whereas such a negative gap seems to be less sizeable for women. In the remaining cases, a positive premia is estimated for both genders, though higher for males (see Table 7). In Cyprus, Germany, Ireland, the Netherlands Slovenia and Italy, the public wage gap for low-skilled females is especially high when compared with both males and higher levels of educational attainment. The public wage gap for females with tertiary education is also particularly sizeable in Cyprus, Ireland, Belgium and Luxembourg. In these cases, their male colleagues also enjoy large wage gaps in the public sector. In Spain, the gap for females with high education levels is twice as high as that of the male employees in a similar position.

By taking into consideration the job position (ISCO category),) a clearer picture emerges. Table 8 shows that managers, qualified professionals and technicians usually receive lower wages in the public sector. Specifically, in all cases but Cyprus (where the public wage gap is positive) and Belgium (where it is not significant) the public wage gap is negative and remarkably sizeable, often below -20% compared to earnings in the private sector. On average for the countries that report data on "public administration, defence and compulsory social security," the negative public wage premium stands at almost -23%; in fact, the public wage premium tends to be more negative in these countries. The most salient cases are Bulgaria, the Czech Republic and Germany with negative premia higher than 40%, whereas in Spain it is only -6.2%.

Despite less sizeable negative public wage premia in the public sector, the picture for professionals and technicians is similar to that of managers. For the countries reporting on "public administration, defence and compulsory social security", negative premia are found. These are somewhat larger for professionals. The most negative ones are found in Bulgaria, the Czech Republic, Denmark, Estonia, Hungary, Latvia, Romania and Slovakia; for these two job categories in Cyprus and Ireland and for professionals in Spain only public wage gaps are positive and sometimes very high. However, for the countries not reporting on the public administration sector the estimated premia are positive and remarkably large in the case of professionals. For clerical workers negative public wage gaps are usually found too, although in many countries these are not significant; positive gaps are only observed in Spain, Ireland, Luxembourg and Portugal.

For the remaining job categories (sales, craft, plant and elementary) positive, and in many cases quite sizeable, public wage premia are usually found. These are highest in the case of plant workers, amounting to above 25% on average. There is considerable variability, however, in the case of elementary workers, as large and positive public wage gaps are observed in some countries while very negative ones are estimated in others. Despite being quite large in most cases, in general the public wage premia for these four categories are highest in Cyprus, the Czech Republic, Spain, Greece, Ireland, Poland, Romania, Luxembourg and Portugal.

Table 8: Regressions results by country and job position (ISCO)

	Manager	Professional	Technician	Clerical	Sales	Craft	Plant	Elementary
BG	-0.529***	-0.502***	-0.262***	-0.071	0.127**	0.299***	0.362***	0.058
CY	0.1**	0.31***	0.11***	-0.053	0.433***	0.285***	0.323***	0.231***
CZ	-0.454***	-0.328***	-0.122***	-0.069***	0.293***	0.121***	0.263***	0.068**
DE	-0.407***	-0.117***	0.018	-0.023	0.13***	0.083***	0.189***	0.38***
DK	-0.299***	-0.233***	-0.119***	-0.099***	-0.056***	-0.004	0.213***	-0.022***
EE	-0.287***	-0.266***	-0.171***	-0.239***	-0.089	0.054	0.152***	-0.229***
ES	-0.062*	0.108***	-0.016	0.068**	0.383***	0.038	0.407***	0.186***
FI	-0.252***	-0.09***	-0.082***	-0.117***	-0.007	-0.048***	-0.02	0.004
FR	-0.126***	-0.115***	-0.039***	-0.118***	0.08***	0.028	0.287***	0.015
GR	-0.392***	0.021	-0.099**	0.042	0.188***	0.34***	0.394***	0.351***
HU	-0.321***	-0.395***	-0.248***	-0.193***	-0.049	0.085**	0.311***	-0.144***
IE	0.154***	0.259***	0.091***	0.114***	0.306***	-0.015	0.307***	0.362***
LT	-0.161***	0.027	0.003	-0.184***	0.085	0.115**	0.385***	-0.145***
LV	-0.166**	-0.179***	-0.225***	-0.083***	0.036	0.096***	0.215***	-0.157***
NL	-0.151***	-0.081***	-0.07***	0.012	0.144***	-0.132***	0.059*	0.086**
PL	-0.35***	-0.002	-0.069**	-0.004	0.177***	0.205***	0.275***	0.09***
RO	-0.351***	-0.446***	-0.139**	-0.074	-0.003	0.345***	0.493***	-0.101**
SI	-0.098***	-0.038	-0.022	-0.025	0.297***	0.081***	0.149***	0.11***
SK	-0.258***	-0.323***	-0.176***	-0.127***	0.14**	0.016	0.115***	-0.007
UK	-0.156***	0.007	-0.168***	0.009	0.042	-0.002	0.067*	0.059***
AT	-0.093*	0.082***	0.043**	-0.084***	0.049	0.09*	0.353***	0.143***
BE	-0.036	0.15***	0.09***	-0.005	0.122***	0.14***	0.128***	0.112***
IT	-0.116*	0.219***	0.04	-0.075***	0.215***	0.239***	0.212***	0.198***
LU	-0.173***	0.249***	0.14***	0.196***	0.142***	0.305***	0.522***	0.138**
MT	-0.178***	0.014	-0.047	-0.118***	0.262***	-0.061	-0.008	-0.064**
PT	-0.121**	0.076***	-0.034	0.105***	0.106**	0.438***	0.474***	0.158***
EU	-0.229***	-0.071***	-0.052***	-0.029**	0.152***	0.129***	0.269***	0.212***

To summarize, the results by job position are largely in line with previous empirical findings in the sense that workers at higher positions (and normally at higher income brackets) are better remunerated in the private sector, whereas the positive, and sometimes large, public wage gaps are mainly explained by the sizeable gaps observed at lower job positions (and lower levels of income).

5. Comparison between the two waves of the sample

In order to compare the evolution of the wage gap between the two years in the sample, namely 2006 and 2010, equation (1) was estimated for the two years separately, also using the SES sample weights and robust standard errors.

Table 9: Regressions results by country and year

	2006	2010
BG	0.026	-0.093*
CY	0.183***	0.209***
CZ	-0.07***	-0.048*
DE	-0.016	0.013
DK	-0.132***	-0.14***
EE	-0.229***	-0.151***
ES	0.18***	0.162***
FI	-0.065***	-0.069***
FR	-0.075**	-0.023
GR	0.067***	0.089***
HU	-0.044*	-0.163***
IE	0.205***	0.212***
LT	0.022	0.046
LV	-0.106***	-0.075***
NL	-0.126***	-0.005
PL	0.09***	0.065**
RO	0.174***	-0.046
SI	0.046***	0.054***
SK	-0.09***	-0.101***
UK	0.036**	-0.013
AT	0.046**	0.061***
BE	0.124***	0.117***
IT	0.133***	0.105***
LU	0.23***	0.204***
MT	0.049***	-0.011
PT	0.197***	0.119***

Note: *, ** and *** indicate significance at the 10%, 5% and 1% level, respectively. The grey cells refer to the countries for which information on "public administration, defence and compulsory social security" is available.

Table 9 summarizes the results. Column 2010 contains the country estimates for Germany, Spain, France and Greece without including the NACE sector on "public administration, defence and compulsory social security", so that the estimates can be compared with those for 2006. For the rest of the countries the estimates coincide with those in Table 3.

In most cases (Austria, Belgium, Cyprus, Spain, Greece, Ireland, Italy, Latvia, Lithuania, Luxembourg, Poland, Portugal and Slovenia),) the wage gap is positive and highly significant in both cases of the sample (2006 and 2010). In Germany, however, when "public administration, defence and compulsory social security" is removed in 2010 the public wage gap disappears and no significant difference can be found between the two years. In France a negative wage gap for public employees is found in 2006 that disappears when "public administration, defence and compulsory social security" is removed in 2010. In this case, this sector significantly affects the results, as the estimated gap becomes negative and significant when the entire public sector is accounted for (see Table 3). In Spain, however, the sector "public administration, defence and compulsory social security" seems to have a limited impact on the estimated gap.

Malta and Romania move from a positive public sector wage premium in 2006 to a negative one in 2010. In the United Kingdom a positive premium for public sector workers is found only in 2006, whereas in Bulgaria a negative gap is found in 2010. Finally, earnings of private sector employees seem to be higher than for public sector workers in the Czech Republic, Denmark, Estonia, Finland, Hungary, Latvia, the Netherlands and Slovakia, although this negative gap seems to have narrowed between the two years in the Czech Republic, Estonia, Latvia and the Netherlands. In turn, sizeable reductions in the public sector premium are observed in Bulgaria (by almost 12%), Romania (by more than 20%) and, to a lower extent in Portugal (by almost 8%).

6. Conclusions

An accurate measurement of the wage gap between the public and private sectors is needed, particularly when designing public-wage size expenditure-based consolidations with the aim of assuaging distortions in the allocation of production factors.

Public sector employees are found to enjoy on average higher wages than their counterparts in the private sector in 2010. This result is observed in most of the countries assessed in this study, namely Austria, Belgium, Cyprus, Germany, Spain, Greece, Ireland, Italy, Luxembourg, Poland, Portugal and Slovenia. By contrast, privately-employed workers appear to enjoy higher earnings in Bulgaria, the Czech Republic, Denmark, Estonia, Finland, France, Hungary, Latvia and Slovakia. The highest positive wage gaps in the public sector are found in Cyprus, Ireland, Luxembourg, and to a lower extent in Belgium, Germany, Spain, Italy and Portugal.

Table 10 presents the predominant characteristics observed for public sector workers compared to those in the private sector at the EU level, as well as their qualitative impact on the public-private wage gap.

Table 10: Distinctive features of public sectors workers compared to private sector ones and qualitative assessment of their impact on the wage gap

Characteristic	Distinctive features of public workers	Impact on the wage gap
Gender	More feminine	Unclear
Age	Older	Positive
Educational attainment	More highly educated	Negative
Type of contract	More permanent contracts	Not studied

By gender, contrary to other empirical papers, for the countries with full public sector coverage, we do not find evidence of a higher positive wage gap for women. However, in most cases women in countries already EU members before 2004 tend to enjoy higher earnings in the public sector than their male counterparts, whereas in more recent EU Member States we find the opposite result.

By age, on average the premium is higher for older workers. But when controlling simultaneously by age and gender, the public wage premium seems to be higher for young and older female workers.

The public wage premium is, in general, higher for lower levels of education. When considering gender and educational attainment simultaneously, only women with tertiary education seem to enjoy, on average, a better economic position in the public sector when compared with their male colleagues.

By job category, negative public wage premia are found for workers at higher positions, whereas the positive and sometimes large overall public wage gaps are mainly explained by the sizeable gaps observed at lower job positions.

Accordingly, although a positive wage gap is found for public sector workers, this is mainly concentrated on lower-skilled workers, typically occupying lower job positions. Hence, fiscal consolidation measures aiming at reducing the public wage bill may find difficult trade-offs between the efficiency and equity goals.

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Annex I: Country results

Austria

The SES does not contain information for the NACE sector "Public administration and defence; compulsory social security", for which the public sector coverage is incomplete. According to the information in the sample, public employment in 2010 amounts to 12% of total employment, with a similar proportion in 2006.

Based on the data in the SES, public wages were 6.1% higher than in the private sector in 2010 (4.6% in 2006). This gap was higher for males: 6.7% compared with 5.4% for females. By age, only a positive gap is observed for older workers (10.2%). A positive public wage premium is also observed for workers with secondary education (6.5%) and higher education (4.6%), whereas no significant premium is found for employees with low education levels. Males with medium education levels in the public sector have a wage premium compared to the private sector of 8.4%, whereas for high educational attainment the positive public wage gap is only significant for females (7%). By job position, managers and clerical workers obtain a lower remuneration than in the private sector, whereas the highest wage gaps in the public sector are observed for workers in the lowest professional category (i.e. 35.3% for plant workers).

Belgium

The SES does not contain information for the NACE sector "Public administration and defence; compulsory social security", for which the public sector coverage is incomplete. According to the information in the sample, public employment amounts to 12% of total employment in 2010, with a similar proportion (14%) in 2006.

Based on the data in the SES, public wages were 11.7% higher than in the private sector in 2010 (12.4% in 2006). This gap was higher for females; 12.8% compared with 10.4% for males. The positive gap is observed for all age groups, being highest for younger workers (17.6%). A positive public wage premium is also observed at all levels of educational attainment, with the largest one observed for workers with high education (13.4%) and the lowest one estimated for employees with secondary education (some 6%). By gender and education, males with low and medium levels of education in the public sector have a wage premium compared to those in the private sector of around 9.5%, reflecting a higher than for women, for whom no significant premium is observed for secondary education. However, for high educational attainment the positive public wage gap is higher for females (6.4% compared with 9.7% for their male counterparts). By job position, positive public wage premia are observed at all job levels by similar sizes, except for managers and clerical workers.

Bulgaria

The SES contains full coverage by NACE sector. In 2010 public employment in the sample amounts to 30% of total employment therein, with a slightly higher proportion (34%) in 2006.

Based on the data in the SES, public wages were -9.3% lower than in the private sector in 2010 (comparable in 2006). The public wage gap is non-significant for males and negative for females (-26.1%). An important negative wage gap is observed for young and middle-aged workers (-40.9% and -14.9% respectively) whereas older public employees enjoy similar wages to their private sector counterparts. Workers with low and medium educational levels enjoy positive wage gaps (12.6% and 12.4%), whereas those with high levels of education have a very negative wage gap (-39.7%). Young males suffer from a negative wage gap (-26.0%) while older males enjoy a positive one (11.0%), whereas young and middle-aged females experience particularly large negative wage gaps (-56.8% and -31.8%). By gender and educational attainment, male public sector workers with low or medium educational levels enjoy higher wages than their private sector counterparts, while females have similar wages. Highly educated workers suffer from a negative wage gap regardless of their gender, though the gap is larger for females (-47.3% versus -28.4%). By job position, public sector workers within higher professional categories obtain remunerations much lower than in the private sector (i.e. -52.9% for managers), whereas workers within lower job categories enjoy a positive wage gap (i.e. 36.2% for plant workers).

Cyprus

The SES contains full coverage by NACE sector. In 2010 public employment in the sample amounts to 28% of total employment therein, with a similar proportion (30%) in 2006.

Based on the data in the SES, public wages were almost 21% higher than in the private sector in 2010 (18.3% in 2006). This gap was similar across genders, though somewhat higher for males. The positive gap is observed for all age groups, being highest for older workers (26.5%) and very sizeable also for younger workers (23%). A positive public wage premium is also observed at all levels of educational attainment, although the largest one is observed for workers with low levels of education (29.8%), with the lowest one estimated for employees with secondary education (16.6%). For highly educated workers, the public wage premium stands above 20%. By gender and education, males in the public sector with low and medium levesl of education have a wage premium compared to the private sector between 29.3% and 19.1%, respectively. For women, the premium amounts to 32.6% in the case of low educational attainment, whereas no significant premium is observed for female workers with secondary education. For workers with high educational attainment the positive public wage gap is higher for females (23.7% compared with 17.1% for their male counterparts). By job position, positive public wage premia are observed in all job categories

except clerical workers, with premia being higher for those working in lower professional categories.

Czech Republic

The SES contains full coverage by NACE sector. In 2010 public employment in the sample amounts to 28% of total employment therein, with a similar proportion (27%) in 2006.

Based on the data in the SES, public wages were -4.8% lower than in the private sector in 2010 (-7% in 2006). The public wage gap is non-significant for males and negative for females (-7.6%). An important negative wage gap is observed for young and middle-aged workers (-11.6% and -9.8% respectively) whereas older employees enjoy a positive wage gap (6.9%). Workers in the public sector with lower levels of education also enjoy higher wages than their private sector counterparts (9.3%) whereas those with high levels of education have a very negative wage gap (-30.1%). By gender and age, young and middle-aged females are found to experience strong negative wage gaps (-14.8% and -11.1% respectively), whereas older males enjoy a positive wage premium (9.5%); all other coefficients are non-significant. By gender and educational attainment, workers with low levels of education are found to enjoy a positive wage gap regardless of their gender (10.4% for males and 7.5% for females) whereas among workers with medium levels of education, only males enjoy a positive wage gap (9.2%); all highly-educated workers suffer from a strong negative wage gap. By job position, public sector workers within higher professional categories obtain much lower remunerations than in the private sector (i.e. -45.4% for managers), whereas workers within lower job categories enjoy positive wage gaps (e.g., 29.3% for salesmen).

Denmark

The SES contains full coverage by NACE sector. In 2010 public sector employment in the sample amounts to 45% of total employment therein, with a much lower proportion (25%) in 2006, suggesting that the figures for both years might not be fully comparable.

Based on the data in the SES, public wages were -14.0% lower than in the private sector in 2010 (-13.1% in 2006). This public wage gap is similar across genders, though somewhat larger for males. The negative wage gap is observed across all age groups and levels of educational attainment, being significantly smaller for young workers (-5.7%) and larger for middle-aged (-16.8%) and highly educated workers (-20.7%). Young males working in the public sector are the only category of employees for which wages are comparable to that of their private sector counterparts. By gender and educational attainment, the negative wage gap is systematically negative and increasing in size with the level of education, regardless of gender. By job position, public sector plant workers enjoy a positive wage gap (21.3%) and

craft workers have a non-significant gap; all other professional categories have a negative wage gap, particularly managers (-29.9%) and professionals (-23.3%).

Estonia

The SES contains full coverage by NACE sector. In 2010 public sector employment in the sample amounts to 36% of total employment therein, with a similar proportion (33%) in 2006.

Based on the data in the SES, public sector wages were -15.1% lower than in the private sector in 2010 (-23.4% in 2006). This public sector wage gap is significantly larger for females (-23.0%) than for males (-8.3%); it is also larger for young and middle-aged employees (-18.9% and -20.0%) than for older employees for whom no significant gap is observed. Workers with low and medium levels of education have mild negative wage gaps (-7.2% and -8.6%) whereas those with high levels of education have a larger one (-24.2%). By gender and age, all groups except older males are found to have a negative public wage gap, and females are found to be consistently disadvantaged compared with males in every age group. By gender and education, male public workers with low or medium educational levels are found to enjoy similar wages to their private sector counterparts, whereas females with similar levels of education suffer from negative wage gaps; highly-educated workers have negative wage gaps regardless of their gender. By job position, public plant workers enjoy a positive wage gap (15.2%) while craft workers and salesmen have a non-significant gap; all other professional categories suffer from a large negative wage gap, from -17.1% (technicians) down to -28.7% (managers).

Finland

The SES contains full coverage by NACE sector. In 2010, public employment in the sample amounts to 39% of total employment therein, with an identical proportion in 2006.

Based on the data in the SES, public wages were -6.2% lower than in the private sector in 2010 (-6.9% in 2006). This public wage gap is similar across genders; it is negative for all age groups except young people for whom no significant gap is observed. The wage gap is also negative for all levels of education, with the largest negative wage gap being observed for public sector workers with low levels of education (-11.0%). Results by age and gender yield very similar results for males and females. By age and educational attainment, the most significant difference is obtained for public sector workers with low levels of education: males appear significantly worse off (-14.6% wage gap) than their female counterparts (-7.2%). Finally, by job position, a negative wage gap is observed for all professional categories except salesmen, plant workers and elementary workers, for which the gap is non-significant; it is particularly large for managers (-25.2%).

France

The SES only contains information for the NACE sector "Public administration and defence; compulsory social security" in the 2010 series. Hence, the public sector coverage for 2006 is incomplete. In 2010, with full coverage by NACE sector, public employment in the sample amounts to 31% of total employment therein. This figure is not comparable with that for 2006.

Public wages were, on average, -3.7% lower than in the private sector in 2010. The public wage gap is non-significant for males and negative for females (-5.4%). A negative wage gap is observed for all age groups, though it is slightly larger for younger individuals (-5.7% versus -3.7% for middle-aged and older workers). Less educated workers in the public sector enjoy higher wages than their private sector counterparts (positive wage gap of 6.4%) whereas highly-educated employees have a negative wage gap (-10.1%) and employees with middle-level education a non-significant one. By gender and age, the only significant public sector wage gap found for males is for younger workers (-8.8%), whereas young females have a non-significant wage gap; on the other hand, middle-aged and older females have a negative public sector pay gap (-6.0% and -4.6% respectively). By gender and educational attainment, males workers with low levels of education have a positive wage gap (11.4%) and those with medium levels of education a non-significant one, while females with low levels of education have a non-significant wage gap and those with medium educational levels a negative wage gap (-4.2%); highly educated workers have a negative wage gap regardless of gender. By job position, public sector workers within higher professional categories obtain lower remunerations than in the private sector (i.e. -12.6% for managers) whereas workers within lower job categories enjoy positive or non-significant gaps (e.g., 28.7% for plant workers or 8% for salesmen).

Germany

There are two types of public sector workers in Germany, namely "officials" (*Beamte*) and "ordinary civil servants" (*Angestellte*). Officials have a job guarantee, but in turn no right to strike and may have to accept specific postings, although in practice also ordinary civil servants have usually very stable and unlimited contracts in the public administration. However, as far as net salaries are concerned, there is a significant difference between the two categories. Net salaries are usually higher for officials compared to ordinary civil servants in that officials do not need to pay pension or unemployment insurance contributions as these are paid by the federal or state governments. There has been a tendency over the past years to reduce the share of officials compared to ordinary civil servants, in particular in the Eastern Federal States, with a view to reducing public expenditure on officials' pensions. Despite this trend, the existence of these two categories of public workers implies that the public wage gap for "officials" is actually higher than that estimated in this paper, whereas for "ordinary civil servants" the opposite is true.

The SES only contains information for the NACE sector "Public administration and defence; compulsory social security" in the 2010 series. Hence, the public sector coverage for 2006 is incomplete. In 2010, with full coverage by NACE sector, public sector employment in the sample amounts to 24% of total employment therein. This figure is not comparable with that for 2006.

Public wages were, on average, 10% higher than in the private sector in 2010. This gap was higher for females; almost 13% compared with 8.3% for males. The positive gap is observed for all age groups, always above 6.5% and being highest for older workers (14.8%). The positive public wage premium is highest for workers with a low level of educational attainment (24.5%), whereas it is very negative (-16.8%) for workers with tertiary education. By gender and education, males and females in the public sector with low and medium levels of education have similar wage premia compared to those in the private sector, approximately 24% and 12%, respectively; for workers with tertiary education, the negative wage gap is significantly larger for males (-21.5% compared with -7.9% for females). By job position, negative public wage premia are observed for managers and professionals, whereas sizeable positive premia are estimated for workers in the lowest professional categories.

Greece

The SES only contains information for the NACE sector "Public administration and defence; compulsory social security" in the 2010 series. Hence, the public sector coverage for 2006 is incomplete. In 2010, with full coverage by NACE sector, public sector employment in the sample amounts to 27% of total employment therein. Although this figure might not be comparable with that for 2006, the share of public employment is almost the same in both series (26% in 2006).

Public sector wages were, on average, 8.3% higher than in the private sector in 2010. This gap was higher for males; almost 10.3% compared with 6.6% for females. The positive gap is higher for young workers (14.5%), while non-significant for older workers. Moreover, the positive public sector wage premium is highest for workers with a low level of educational attainment (28.7%), whereas it amounts to 15% for workers with secondary education; no significant premium is detected for workers with tertiary education. By gender and education, males and females in the public sector with low and medium levels of education enjoy positive wage premia compared to those in the private sector, although this is higher for male employees, amounting to 38% even in the case of low education. By job position, negative public wage premia are observed for managers (-39.2%) and technicians (-9.6%), whereas sizeable positive premia are estimated for workers in the lowest professional categories (e.g., 39.4% in the case of plant employees).

Hungary

The SES contains full coverage by NACE sector. In 2010 public employment in the sample amounts to 41% of total employment therein, with a similar proportion (44%) in 2006.

Based on the data in the SES, public sector wages were -15.8% lower than in the private sector in 2010 (non-significant in 2006). This public wage gap is significantly larger for females (-22.7%) than for males (-8.5%). The size of this negative public wage gap is found to decrease with age, from -21.6% for young employees to -8.2% for older ones. The negative wage gap is very strong for highly educated employees (-38.1%) but not significant for those with low educational levels. By gender and age, females are found to disadvantaged compared with males across all age categories: the negative wage gap for young females (-29.2%) is about twice as big as that of males (-14.7%), and middle-aged and older females suffer from a negative public wage gap while the gap for males is non-significant. The picture by gender and educational attainment is similar, as females are also consistently worse off than males: females with low and medium levels of education suffer from a negative public wage gap while the gap for males is non-significant, while the negative wage gap for highly educated males and females is comparable though still higher for females (35.1% versus 40.0%). By job position, public sector plant workers (31.2%) and craft workers (8.5%) enjoy a positive wage gap, while salesmen have a non-significant gap; all other professional categories exhibit a large negative wage gap ranging from -14.2% (elementary workers) down to -39.5% (professionals).

Ireland

The SES contains full coverage by NACE sector. In 2010 public employment in the sample amounts to 32% of total employment therein, up from 28% in 2006.

Based on the data in the SES, public wages were around 21.2% higher than in the private sector in 2010. The gap was higher for females; 21.8% compared with 19.6% for males. A sizeable positive gap is observed for all age groups and decreases with age, ranging from 34.6% for younger workers to 17.6% for older workers. A positive public wage premium is also observed at all levels of educational attainment; the largest one is observed for workers with low education (24.3%), while the lowest one is detected for workers with medium levels of education with 17.5%. The wage premia for females is higher at all levels of educational attainment, although the difference with respect to male workers is lowest for highly-educated employees. By job position, positive public wage premia are observed for all categories except craft workers. Generally, the highest gaps occur with employees working in lower professional categories. It is worth noting that even in the case of managers and professionals the public wage gap is very sizeable, at 15.4% and 26%, respectively.

Italy

The SES does not contain information for the NACE sector "Public administration and defence; compulsory social security", for which the public sector coverage is incomplete. According to the information in the sample, public sector employment in the sample amounts to 24% of total employment in both years.

Based on the data in the SES, public wages were approximately 10.5% higher than in the private sector in 2010. The gap was higher for females; 14.5% compared with 5.9% for males. A sizeable positive gap is observed for young workers (27.1%) and middle-aged workers (11.4%), whereas no significant premium is found for older workers. A positive public wage premium is also observed at all levels of educational attainment, the largest one being observed for workers with low levels of education (15.9%), while the lowest one is detected for workers with medium levels of education with 4.5%. A sizeable wage premium for females is found at all levels of educational attainment, whereas for male workers only a significant one is found for low education. By job position, negative public wage premia are observed for managers (-11.6%) and clerical workers (-7.5%), whereas sizeable positive premia are estimated for workers in the lowest professional categories (23.9% in the case of craft employees) but also for professionals (21.9%).

Latvia

The SES contains full coverage by NACE sector. In 2010 public employment in the sample amounts to 45% of total employment therein, with a slightly lower proportion (41%) in 2006.

Based on the data in the SES, public sector wages were -7.5% lower than in the private sector in 2010 (-10.6% in 2006). The public wage gap is non-significant for males and negative for females (-13.9%). A negative public wage gap is found for young (-17.3%) and middle-aged (-10.6%) employees, while it is not significant for older employees. By education, only highly educated employees have a negative public wage gap that is significant (-20.3%). By age and gender, male employees are consistently better off than female employees, as middle-aged males have no significant public wage gap and older males a positive one (8.7%) while the gap for females is always negative. By gender and educational attainment, a non-significant wage gap is found for workers with low levels of education and a strong negative gap for highly educated workers, regardless of gender; however for workers with middle levels of education, males have a positive public wage gap (8.1%) and females a negative one (-8.7%). By job position, public sector plant workers (21.5%) and craft workers (9.6%) enjoy a positive wage gap while salesmen have a non-significant gap; all other professional categories suffer from a large negative wage gap ranging from -8.3% (clerical workers) down to -22.5% (technicians).

Lithuania

The SES contains full coverage by NACE sector. In 2010 public employment in the sample amounts to 42% of total employment therein, with a similar proportion (39%) in 2006.

Based on the data in the SES, there is no significant public wage gap in 2010 or in 2006. By gender, we find a positive wage gap for men (11.8%) and a non-significant one for women. There is no significant public wage gap for any age category, however a positive wage gap is found for workers with a medium level of education (10.0%). By age and gender, the only significant public wage gaps are for middle-aged men (12.1%) and older men (11.9%). By level of education, a strong positive wage gap is found for men with medium levels of education (19.8%) and a negative one for women with medium educational levels (-6.3%); all other coefficients are not significant. By job position, a negative wage gap is found for managers, clerical workers and elementary workers (-16.1%, -18.1% and -14.5%) and a positive one for craft employees (11.5%) and particularly plant workers (38.5%).

Luxembourg

The SES does not contain information for the NACE sector "Public administration and defence; compulsory social security", for which the public sector coverage is incomplete. According to the information in the sample, public sector employment in the sample amounts to 11% of total employment in both years.

Based on the data in the SES, public sector wages were approximately 20.4% higher than in the private sector in 2010. The gap was higher for males; 22.6% compared with 16.1% for females. A sizeable positive gap is observed for all age groups and increases with age, ranging from 21.3% for younger workers to 22.2% for older workers. A positive public wage premium is also observed at all levels of educational attainment, which in all cases is similar and around 20%. The wage premia for females is higher than for males only for employees with high educational levels. However, for workers with low and medium levels of education, the public sector wage gap is significantly higher for male workers. By job position, positive public wage premia are observed for all categories except managers. The highest gaps occurs with workers in lower professional categories (52.2% in the case of plant employees), although the gap is also significantly high in the case of professionals (almost 25%).

Malta

The SES does not contain information for the NACE sector "Public administration and defence; compulsory social security", for which the public sector coverage is incomplete. According to the information in the sample, public employment in 2010 amounts to 28% of total employment, with a somewhat higher proportion in 2006 (35%).

Based on the data in the SES, there is no significant public wage gap in 2010 (positive wage gap of 4.6% in 2006). No significant wage gap is found by age, gender or educational attainment. By gender and age, a significant positive wage gap is found for young males (11.9%) and a significant negative wage gap is found for females with medium levels of education (-13.6%). By job position, negative wage gaps are found for managers (-17.8%), clerical workers (-11.8%) and elementary workers (-6.4%), while positive wage gaps are found for salesmen (26.2%); all other wage gaps are non-significant.

Netherlands

The SES contains full coverage by NACE sector. In 2010 public sector employment in the sample amounts to 37% of total employment therein, with a lower proportion in 2006 (33%).

Based on the data in the SES, there is no significant public sector wage gap in 2010 (negative wage gap of -12.3% in 2006). A negative wage gap is found for males (-5.9%) and a positive one for females (3.9%). The public sector wage gap is positive for younger employees (10.8%) and negative, albeit small, for older employees (-2.7% for middle-aged workers and -3.8% for old workers). Employees with lower and medium levels of education enjoy positive wage gaps (5.3% and 3.4%) while those with higher educational levels suffer from a negative gap (-9.7%). By age and gender, young males and females enjoy a positive wage gap (6.4% and 13.6% respectively), though only older males have a negative wage gap (-7.6% for middle-aged males and -8.1% for old males). By educational attainment, all males are found to suffer from a negative wage gap, though it is smaller for males with low and mediumlevels of education (-3.8% and -3.1%) than for those who are highly educated (-11.9%); on the other hand women with low and medium levels of education enjoy a positive public wage gap (13.4% and 7.4%) while highly-educated women have a negative wage premium (-8%) comparable to their male counterparts. By job position, public sector workers within higher professional categories obtain lower remunerations than in the private sector (i.e. –15.1% for managers and -8.1% for professionals), whereas workers within lower job categories enjoy positive wage gaps (e.g., 14.4% for salesmen and 8.6% for elementary workers).

Poland

The SES contains full coverage by NACE sector. In 2010 public employment in the sample amounts to 38% of total employment therein, down from 41% in 2006.

Based on the data in the SES, public sector wages were approximately 6.5% higher than in the private sector in 2010. The gap was only significant for males at 8.5%. By age groups, only a positive gap of 9.1% is observed for older workers. By educational attainment, positive premia are detected for workers with low (16.2%) and medium levels of education (13.1%), while a sizeable negative gap is found for highly-educated workers. Positive wage

premia of around 18% are estimated for males with low and medium levels of education, whereas the gap is negative (almost -16%) for highly-educated males. For females, a positive gap is found with low levels of education; in the remaining cases, the estimates are not significant. By job position, positive public wage premia are only observed for workers in lower professional categories, with the highest gap occurring in the case of plant workers at 27.5%. In the case of managers, very negative gaps of -35% are observed.

Portugal

The SES does not contain information for the NACE sector "Public administration and defence; compulsory social security", for which the public sector coverage is incomplete. According to the information in the sample, public employment in the sample amounts to 19% in 2010, up from 17% in 2006.

Based on the data in the SES, public sector wages were around 11.9% higher than in the private sector in 2010. The gap was somewhat higher for females; 12% compared with 10.9% for males. A sizeable positive gap is observed for all age groups. This gap is larger for younger workers (13.9%), whereas for middle-aged and lower workers is very similar reaching 8.8%. A positive public sector wage premium is also observed at all levels of educational attainment; the largest one is observed for workers with low educational levels (18.6%), while the lowest one is detected for workers with high levels of education with 4.5%. The wage premia for females is only higher at high levels of educational attainment, though there does not seem to be a significant and comparable wage gap for male workers. By job position, positive public sector wage premia are observed for all categories except managers (with a negative premium of -12.1%) and technicians (not significant). Generally, the highest gaps occur for workers in lower professional categories (e.g., 47.4% in the case of plant workers).

Romania

The SES contains full coverage by NACE sector. In 2010 public employment in the sample amounts to 34% of total employment therein, with a similar proportion in 2006 (33%).

Based on the data in the SES, there is no significant public wage gap in 2010 (positive wage gap of 17.4% in 2006). The public wage gap is non-significant for males and negative for females (-23.7%). By age, the only significant gap found is for young workers (-37.1%). Employees with low and medium levels of education are found to enjoy positive wage gaps (11.3% and 17.0%), while those with higher educational levels suffer from a negative wage gap (-42.2%). By age and gender, young females are found to suffer from a much larger negative wage gap than their male counterparts (-51.1% versus -20.7%); middle-aged females also experience a negative wage gap (-23.5%), while all other coefficients are non-

significant. By gender and educational attainment, males with low and middle levels of education enjoy positive gaps (15.8% and 24.9% respectively) while their female counterparts have no significant wage gap; all highly-educated workers suffer from large negative wage gaps, though it is larger for females (-48.9%) than for males (-33.9%). By job position, public sector workers within higher professional categories obtain lower remunerations than in the private sector (i.e. –44.6% for professionals), whereas workers within lower job categories enjoy positive wage gaps (i.e. 49.3% for plant workers).

Slovenia

The SES contains full coverage by NACE sector. In 2010 public employment in the sample amounts to 39% of total employment therein, up from 37% in 2006.

Based on the data in the SES, public sector wages were approximately 5.6% higher than in the private sector in 2010. The gap was only significant for males at 8%. By age groups, the positive gap increases with age, amounting to 6.5% in the case of older workers. By educational attainment, positive premia are detected for workers with low (11.3%) and medium levels of education (8.1%), while no significant gap is found for highly-educated workers. Positive wage premia of approximately 10.5% are estimated for males with low and medium levels of education, whereas a gap of 14.4% is estimated for females with low educational attainment. In no other case are significant premia estimated. By job position, positive public wage premia are only observed for workers in the lower professional categories, with the highest gap occurring for sales employees at 29.7%. In the case of managers, a negative gap of -9.1% is observed.

Slovakia

The SES contains full coverage by NACE sector. In 2010 public employment in the sample amounts to 31% of total employment therein, with an identical proportion in 2006.

Based on the data in the SES, public sector wages were -10.1% lower than in the private sector in 2010 (-9.0% in 2006). The public wage gap is non-significant for males and negative for females (-15.8%). A negative public wage gap is found for young (-15.1%) and middle-aged (-13.6%) employees while it is not significant for older employees. Public sector workers with low levels of education enjoy higher wages than their private sector counterparts (positive wage gap of 6.0%), whereas highly-educated employees have a negative wage gap (-28.4%) and employees with middle levels of education a non-significant one. By age and gender, no significant wage gap is found for males in any age category, while for females a negative wage gap is found that narrows as age increases (-21.7% for young females, -18.4% for middle-aged ones and -8.4% for older females). By age and educational attainment, males workers with low educational levels have a positive wage gap

(13.6%) and those with medium levels of education a non-significant one, while females with low educational levels have a non-significant wage gap and those with medium levels of education a negative wage gap (-10.3%); highly-educated workers have a negative wage gap regardless of gender (-28.6% for males and -27.8% for females). By job position, public sector workers within higher professional categories obtain lower remunerations than in the private sector (i.e. -32.3% for professionals and -25.8% for managers) whereas workers within lower job categories enjoy positive or non-significant gaps (e.g., 14.0% for salesmen and 11.5% for plant workers).

Spain

The SES only contains information for the NACE sector "Public administration and defence; compulsory social security" in the 2010 wave. Hence, the public sector coverage for 2006 is incomplete. In 2010, with full coverage by NACE sector, public employment in the sample amounts to 23% of total employment therein. This figure is not comparable with that for 2006.

Based on the data in the SES, public sector wages were around 15% higher than in the private sector in 2010. On a comparable basis, the gap seems to have narrowed since 2006 by approximately 2 p.p. The gap was higher for females; almost 16.8% compared with 13.1% for males. The positive gap is observed for all age groups, being highest for middle-aged workers (17.9%) and very sizeable also for younger workers (16.7%). A positive public wage premium is also observed at all levels of educational attainment; the largest one is observed for workers with low levels of education (20.8%), whereas the public wage premium for highly educated workers stands at around 9%. The wage premia for females is higher at all levels of educational attainment. While the wage premia are similar across genders for workers with low levels of education, the premium is significantly higher for females with medium (with 19.1%) and high educational levels (11.9%). By job position, positive public wage premia are observed for all categories except managers (-6.2%), technicians and craft workers (non-significant in both cases). The highest gaps take place for workers in lower professional categories.

Sweden

The SES contains full coverage by NACE sector. In 2010 public employment in the sample amounts to 15.7% of total employment therein, with a similar proportion in 2006 (15%). However, the SES does not contain information about the type of contract for Sweden, for which equation (1) has been estimated for all the different possibilities as for the other countries but without controlling for the type of contract. Table 11 summarizes the regression results for Sweden by group of characteristics.

Based on the data in the SES, public sector wages were -12.5% lower than in the private sector in 2010 (-13.8% in 2006). This negative public wage gap was larger for males; -14.1% while for females stood at -10.3%. The negative wage gap is also observed across all age groups, being largest for middle-aged workers although the difference with respect to older workers is small. In all cases the negative gap is higher for males. A negative public wage premium is also found for all levels of educational attainment. The size of the negative premium rises with the level of education and is always more sizeable for male workers. For example, it amounts on average to -19.3% in the case of males with tertiary education. By job position, only a positive public sector wage premium of 7.5% is found for plant workers; in the remaining cases either negative or no significant premia are observed. The most sizeable ones show up in the cases of managers (-25.4%) and technicians (some -22%).

Table 11: Estimates for Sweden by group of characteristics

	Both genders	Male	Female
Total	-0.125***	-0.141***	-0.103***
By age			
Young (15-29)	-0.075***	-0.094***	-0.061***
Middle (30-49)	-0.143***	-0.161***	-0.118***
Old (50+)	-0.122***	-0.145***	-0.096***
By education			
Low education	-0.058***	-0.084***	-0.041***
Medium education	-0.06***	-0.076***	-0.052**
High education	-0.17***	-0.193***	-0.141***
By job position			
Manager	-0.254***		
Professional	-0.187***		
Technician	-0.221***		
Clerical	-0.095***		
Sales	-0.004		
Craft	-0.041***		
Plant	0.075***		
Elementary	-0.008		

Note: *, ** and *** indicate significance at the 10%, 5% and 1% level, respectively.

United Kingdom

The SES contains full coverage by NACE sector. In 2010 public sector employment in the sample amounts to 33% of total employment therein, with a lower proportion in 2006 (29%).

Based on the data in the SES, there is no significant public wage gap in 2010 (positive wage gap of 3.6% in 2006). No significant public sector wage gap is observed either by gender or level of educational attainment. By age, however, positive wage gaps are found for young

(10.7%) and old (4.9%) employees. By age and gender, positive wage gaps are found for both young males and young females (9.4% and 10.9%) and for old males (8.1%) while all other coefficients are non-significant. By age and educational attainment, the only significant coefficient is for females with low levels of education (4.6%). By job position, a negative wage gap is found for managers (-15.6%) and technicians (-16.8%) and a positive one for plant workers (6.7%) and elementary workers (5.9%); all other coefficients are non-significant.

Annex II: The Blinder-Oaxaca decomposition[8]

The Blinder-Oaxaca decomposition relies on the assumption of the existence of two different groups for which the difference in one variable is to be assessed. In our case, the two groups are public (pub) and private (priv) sector workers, the outcome variable the (log) hourly earnings (w^l), and a set of predictors (X^l) such as gender, level of education, age group, ISCO job category and sector of activity. This decomposition aims at assessing how much of the mean outcome difference

$$gap = E(w^{pub}) - E\left(w^{priv}\right) \tag{3}$$

where *E(w)* denotes the expected value of hourly earnings, is accounted for by group differences in the predictors. This expected value is gauged from the linear model

$$w^l = X^l\beta^l + \varepsilon^l \quad , \quad E(\varepsilon^l) = 0, \;\; l \in \{pub, priv\} \tag{4}$$

Since by assumption $E(\beta^l) = \beta^l$ it holds that $E(w^l) = E(X^l)\beta^l$. Accordingly,

$$gap = E(X^{pub})\beta^{pub} - E\left(X^{priv}\right)\beta^{priv} \tag{5}$$

In order to identify the contribution of group differences in predictors to the overall outcome difference, it is convenient to add and subtract some terms to rearrange equation (5) as:

$$gap = \left[E(X^{pub}) - E\left(X^{priv}\right)\right]\beta^{priv} + E\left(X^{priv}\right)\left(\beta^{pub} - \beta^{priv}\right)$$

$$+\left[E(X^{pub}) - E\left(X^{priv}\right)\right]\left(\beta^{pub} - \beta^{priv}\right) \tag{6}$$

This is a "three-fold" decomposition, with the first summand amounting to the part of the differential that is due to group differences in the predictors (the "endowments effect"), the second component measuring the contribution of differences in the coefficients, and the third summand referring to the interaction between the differences in endowments and coefficients that exist simultaneously between the two groups.

Note that decomposition (6) is formulated from the viewpoint of private workers. That is, the first summand measures the expected change in private workers' wages if they had the public workers' characteristics. Similarly, the second component measures the expected change in private workers' wages if they had the coefficients associated to public employees.

An alternative decomposition results from the concept that there is some non-discriminatory coefficients vector that should be used to determine the contribution of the differences in the predictors. Let β^* be such a non-discriminatory coefficients vector. Hence, in our case the total wage difference between the public and private sector can then be expressed as

[8] This technical annex follows closely the explanation provided in Jann (2008).

$$gap = \left[E(X^{pub}) - E\left(X^{priv}\right)\right]\beta^{*} + [E(X^{pub})(\beta^{pub} - \beta^{*}) + E\left(X^{priv}\right)\left(\beta^{*} - \beta^{priv}\right)]$$

which is equation (2) in the main text and where the first summand is the part of the wage differential that is "explained" by group differences in the personal characteristics (the "quantity effect") and the second summand is the "unexplained" part and the wage gap we are interested in measuring.

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