

**Public-Private Wage Premium and Heterogeneity:
An Analysis for Six European Countries**

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Abstract

Relying upon Eurostat data from the 2010 *Structure of Earnings Survey*, this paper draws a comparative picture of public vs. private earning gaps in six representative European economies (France, Germany, Italy, Spain, Sweden, UK). Our analysis extends to monthly earnings (going beyond the usually considered hourly earnings) and emphasises issues of comparability in several ways. We poise public sector workers against their appropriate counterpart: employees from large private firms, we complement the customary Oaxaca-Blinder decomposition with that obtained from Ćnopo's matching approach, we consider jobs and professional figures within the same sectors (basically NACE's P (Education), Q (Human health and social work activities), and utilities), and we consider workers characterised by similar levels of education. We find a public wage premium for monthly earnings mostly in UK and Spain, and with hourly earnings also in Italy. Generally, less educated employees working in the public sector fare better (in terms of premium) than their more educated colleagues. Female public sector workers are generally better off than their male counterparts. Sector-wide estimates suggest that rather different mechanisms of wage determination are at work in different segments of the public sector.

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1. Introduction

Labour market in the public sector presents many peculiar characteristics differentiating it from that in the private sector: criteria adopted to select, recruit and promote workers, to determine wage levels, as well as wage profiles, career advancement and industrial relations. Nevertheless the economic literature has dedicated relatively little room to analyse its functioning. This is surprising considering the importance of the public sector for the total employment: in 2013, in Europe 15.0% of men and 37.0% for women were employed in the public sector. In Norway, Denmark and Sweden more than 50% of female workers are public sector workers. In this paper, using a database not widely used, Eurostat's *Structure of Earnings Survey*, we investigate wage differences across public and private sector in six European countries. Given the obvious relevance of gender issues in this field, we are interested from the outset of the analysis in the interaction between public vs. private and female vs. male earning gaps. But a key feature of our analysis is that we stress issues of heterogeneity and comparability in a wider sense.

A first important point concerning comparability is that we complement the customary Oaxaca-Blinder decomposition with that obtained from Nopo's matching approach. There are however other issues of comparability. We believe that a correct comparison between the public and the private sector should focus mainly on the comparison between public employers and large private enterprises (hereafter LPE's; firms with more than 250 employees). Generally speaking, public employees have the same rights and wages independently of working in small or large establishments; this is not true in the private sector. Yet, trade-unions strength and human resource management tend to be more similar in the public sector and in LPE's. After all, the public sector could be deemed as a country's largest employer. Hence the comparison between public sector and LPE's seems to be the most correct one in principle. A further (and separate) issue is that some jobs exist only in the public sector; for these jobs (in public administration and defence; compulsory social security) there is no sense in comparing their earnings with the private sector. Only jobs and professional figures within similar sectors should be, at least in principle, considered. Subsequently, we shall exclude NACE sector O (public administration and defence; compulsory social security) from our field of analysis, and shall refine our analysis by considering jobs and professional figures within the same sectors (basically NACE's P (Education), Q (Human health and social work activities), and utilities). Finally we deal with another important source of heterogeneity, by providing estimates for workers characterised by similar levels of education.

Unlike in most of the existing literature, we shall not restrict our attention to hourly earnings. The reason for being interested also in monthly earnings comes from considering that people, especially women, who want to work into the public sector may choose this sector because it permits to better conciliate work and family life. In other words they may prefer lower earnings in exchange for shorter and more flexible working schedules. Dealing with hourly earnings could bias the analysis, and wrongly lead to the conclusion that a wage premium (actually based on shorter work hours) exists, if people are in fact interested in the purchasing power of their total earnings. Besides, as shall become clearer below, hourly earning may in some cases be affected by potentially serious measurement errors.¹

The structure of the paper is the following: after a brief literature review in section 2, section 3 describes in some detail the analytical framework; in section 4 the SES (Structure of Earnings Survey) database is presented, while section 5 includes the main empirical results. The last section, as usually, contains some concluding remarks.

¹ In fact, a more correct comparison should be based on annual earnings because only at this level it is possible to include in earnings some components of the remuneration such as annual bonuses and allowances not paid at each pay period. A problem with annual earnings is that a year is a relatively long period and some employees may not work with the same employer throughout all this period.

2. A brief survey of the literature

Most of the numerous empirical contributions about the private-public wage gap have investigated its size and quantitative characteristics, with fairly little attempt to provide support for theoretically-based arguments.

The seminal analyses of Smith (1976a, 1976b) for the US involve estimation of a Mincerian wage equation: the significance of a dummy variable for public sector workers indicates the existence of a public sector wage premium. About this type of approach Gregory and Borland (1999) observe: “*One problem with the dummy variable approach to estimating the effect of a worker’s sector of employment on earnings is that it models the effect of sector as an “intercept” effect- return to other productivity-related characteristics and job attributes are restricted to be equal across sectors.*” Despite its limitations, this methodology has been applied in many studies, which almost invariably find a wage premium for public sector workers, comparatively higher for female workers (Giordano et al., 2011; Depalo et al., 2013).

An alternative approach, following the methodology proposed by Oaxaca, 1973, and Blinder, 1973, involves estimating separate Mincerian equations for workers from public and private sector, and using the parameter estimates to decompose the average public-private wage gap into effects (a) attributable to differences in characteristics and (b) to the returns to these characteristics (the latter component reflecting the wage premium paid by the public sector to workers with the same characteristics as those of workers in the private sector).

Applications of this approach usually yield that differences in characteristics account for most of the public-private wage gap, but also confirm the presence of a public sector wage premium, which is greater for women. Difficulties with this approach (a selection bias) arise when wages across sectors depend on unobserved productivity-related characteristics, and sorting of employees between sectors on the basis of those characteristics occurs. The results of studies correcting for this bias, however, do not always coincide. While for most countries the wage premium widens in some cases the contrary happens. Furthermore, the magnitude of the selection effect differs greatly between studies.

Recent studies highlight the need to analyse wage differentials solely in the case of workers that are strictly comparable (that is, in the case of those whose observable characteristics are present in both the public and private sectors). Indeed, as noticed by Disney (2007) and Ramos *et al.* (2014), some jobs can exist only in the public sector; for these jobs there is no sense in a comparison with the private sector. These studies undertake their analyses employing the matching methodology proposed by Nopo (2008), which allows the common support of the distributions and its impact on the decomposition of wage differentials to be established between sectors. Other solutions to the problem of heterogeneity include the Fortin *et al.* (2010) decomposition. Ramos et al. (2014) provide a recent application of this technique.

3. The empirical framework

The Oaxaca-Blinder specification is arguably still today the workhorse in the empirical literature about wage differentials.² This approach separates the part of the observed gap that can be explained by observable differences between workers (group differences in endowments and other characteristics), and a residual, unexplained, part that has been variously labelled as the “premium”, the residual advantage to be employed in a certain job, the discriminatory gap, and so on. Clearly, this unexplained part could depend on unobservable characteristics of workers and jobs. In fact, taking stock of our short survey of the literature, we maintain that the most important problem to be faced in an empirical analysis of this kind is heterogeneity.³ Workers and employers are different

² A very large survey of the alternative decomposition methods can be found in Fortin *et al.* (2010).

³ There is in fact another very serious problem (widely analysed in the study of gender pay gap): the selection bias linked to the decisions to work, and to work in a given sector. This problem is usually dealt through the Heckman correction. In order to avoid an identification problem this correction needs some variables that influence the choice of

between public and private sector but also within sectors, although the differences are higher in the private sector. Workers differ for factors such as their innate capabilities, their acquired skills and their preferences. One obvious way to deal with heterogeneity is to divide the sample in many (more homogenous) subsamples to take into account the differences between workers. The problem is that each subsample may be too small to grant statistical representativeness to the results. To deal with the problems of heterogeneity, the literature has suggested various alternatives. An attractive solution is the Ñopo matching procedure (Ñopo, 2008) that considers the differences in the supports of the distributions of observable characteristics, i.e. the fact that some jobs exist only in the public sector and public sector workers generally do not perform jobs performed in the private sector. The Ñopo nonparametric approach does not require the estimation of earnings equations and divides the gap into four additive elements: two of these are analogous to the elements of the Oaxaca-Blinder decomposition (but computed only over the common support), while the other two account for differences in the supports. The Ñopo approach, however, can easily incur in a curse of dimensionality.

In this paper, we deal with the problem of heterogeneity in a manner explicitly connected with the main public sector workers' characteristics highlighted in the literature. We systematically allow for gender-based differences. We present the results of a Oaxaca-Blinder decomposition comparing public sector workers with private employees from LPE's. Then we replicate these exercises adopting the Ñopo approach. Finally we refine our analysis by carrying out the Oaxaca-Blinder decomposition within the sectors characterised by a significant presence of both public and private workers, basically NACE's P (Education), Q (Human health and social work activities)⁴ and Utilities,⁵ and within groups of workers characterised by similar levels of education.

We consider six countries for the analysis: the four largest Euro-area countries (Italy, France, Germany and Spain) plus the United Kingdom, the largest country outside Euro-area, and Sweden, a relatively large economy well-known for the peculiar characteristics of its welfare state and the high incidence of public sector on female employment. We will exclude from the analysis part-timers, young workers (below 20 years of age) and workers for which there is ambiguity about the size or the proprietary form (public or private) of their establishments.

4. The data

The dataset employed in the paper is the *Structure of Earning Survey* (SES). We mainly rely on the most recent wave of this dataset, referring to 2010. These data have already been utilised in order to analyse earning differences between public and private sector by Ramos *et al.* (2014) for a single country (Spain) and by de Castro *et al.* (2013) for a broad analysis of the whole European Union. Here we will compare a limited number of countries with a deeper analytical focus than the one adopted by de Castro *et al.* (2013).

sector by workers but not wage determination *per se*. In general, these variables are represented by socio-demographic characteristics distinguishing employed workers from the rest of population. Unfortunately, as already observed by Ramos *et al.* (2014), the database we use (the SES), only including matched employer-employee data, does not contain such variables.

⁴ In fact, rather than sector Q we have to consider the following (similar) aggregation: X86 (Human health activities), X87 (Residential care activities), X88 (Social work activities without accommodation) and X75 (Veterinary activities). For most countries the data are presented with this aggregation and it is not possible to disaggregate further these data.

⁵ Utilities are defined for France, Spain, Sweden and UK as X35 (Electricity, gas, steam and air conditioning supply), X36 (Water collection, treatment and supply), X49 (Land transport and transport via pipelines), X50 (Water transport), X51 (Air transport) and X52 (Warehousing and support activities for transportation); for Germany, in addition to the previous sectors: X37 (Sewerage), X38 (Waste collection, treatment and disposal activities: materials recovery) and X39 (Remediation activities and other waste management services); finally for Italy only X35, X36, X49 and X52.

As often happens, the choice of a particular dataset present pros and cons. The most important cons in SES data are the inclusion of information only on employed workers (not on the rest of population) and the absence of any information on work histories. However, there are many important pros in using the SES data for the kind of analysis developed in this paper.

The SES provides, for each country, harmonised information on a much larger number of employees than other sources and this allow a more correct comparison between countries. The data concern the level of remuneration, the individual characteristics of employees (sex, age, occupation, job tenure, etc.) and of their employers (economic activity, size and location), for all sectors of economic activity, except NACE classification A (Agriculture, forestry and fishing), T (Activities of households as employers; undifferentiated goods- and services- producing activities of households for own use) and U (Activities of extra-territorial organisations and bodies). The SES generally does not cover micro-enterprises. Indeed, as indicated by Eurostat, “*the inclusion of enterprises with fewer than 10 employees ... is optional*”.

For our purpose it is fundamental to note that SES provides direct information on the proprietary form (public or private) of the firm in which the employee works. When dealing with other cross-country databases, such as EU-SILC, proprietary form is not directly provided by the questionnaire and must be obtained making some restrictive hypotheses (often inferring it from the NACE classification).

All the data presented in this paper are weighted for the *grossing-up factor* for employees indicated in the database. Further information about our sample is provided in Table A.1 in the Appendix.

Both the Oaxaca-Blinder decomposition and the Ñopo approach are based upon the estimation of a Mincerian equation like (1):

$$(1) \ln W_i = \beta_i X_i + c_i$$

The list of the X-variables is provided below.

X-Variables
Sector of economic activity
education
health
utilities
others
Gender
Male
Age
20-29 years
20-39 years
40-49 years
50-59 years
60+ years
Type of occupation
Managers
Professionals
Others
Highest successfully completed level of education and training⁶
ISCED 1

⁶ Germany provides a reduced classification for the level of education attained, limited to three groups.

ISCED 2
ISCED 3
ISCED 4
ISCED 5
ISCED 6
length of service in enterprise, in years (job tenure)
Type of employment contract ⁷
Indefinite duration
temporary/ fixed duration
Apprentice

Note that relying on the rich information of the SES dataset, we included among the X's some variables not commonly found there, such as firm size and job tenure.

5. The main results

We now present our results, starting from the Oaxaca-Blinder decomposition and the Ñopo approach for the whole sample and then proceeding to the various sub-sample refinements.

5.a) The Oaxaca-Blinder decomposition (whole sample)

In all the tables giving the Oaxaca-Blinder decomposition, the total gap, its explained and unexplained parts (the latter being the premium) are expressed in log-points. Values significant at the 1% significance level are underlined twice, and values significant at the 5% level (but not at the 1% level) are underlined once. Obviously, values that are not underlined are significant at a level higher than 5%.

The results based on monthly earnings (Table 5.1) show the existence of a positive wage premium for public sector workers for Italy (not for males), Spain (again not for males) and UK respect to LPE's. Both positive and negative premia are in line with the values found in de Castro et al. (2013). Some differences emerging vis-à-vis the latter study (mainly for Germany and the UK) must be ascribed, in our opinion, to the fact that their raw wage gaps are measured from samples also including part-timers and Sector O.

Table 5.1- Oaxaca-Blinder decomposition (monthly earnings)

	Total	Males	Females	Total	Males	Females
ITALY			FRANCE			
Gap	<u>.0750000</u>	<u>.0930000</u>	<u>.1450000</u>	<u>-.0209646</u>	<u>.0351782</u>	<u>-.0042361</u>
Explained	<u>.0460000</u>	<u>.1130000</u>	<u>.0310000</u>	<u>-.0303794</u>	<u>.0117332</u>	<u>.0158983</u>
Unexplained	<u><u>.0290000</u></u>	<u><u>-.0200000</u></u>	<u><u>.1140000</u></u>	<u><u>.0094148</u></u>	<u><u>.023445</u></u>	<u><u>-.0201344</u></u>
GERMANY			SPAIN			
Gap	<u>-.0930000</u>	<u>-.0660000</u>	<u>-.0210000</u>	<u>.1643543</u>	<u>.1287166</u>	<u>.2700749</u>
Explained	<u>-.0390000</u>	<u>.0090000</u>	<u>.0010000</u>	<u>.1599985</u>	<u>.1482033</u>	<u>.2361826</u>
Unexplained	<u><u>-.0540000</u></u>	<u><u>-.0750000</u></u>	<u><u>-.0220000</u></u>	<u><u>.0043558</u></u>	<u><u>-.0194867</u></u>	<u><u>.0338923</u></u>
SWEDEN			UK			
Gap	<u>-.1261334</u>	<u>-.0942643</u>	<u>-.0792516</u>	<u>.0553233</u>	<u>.0666271</u>	<u>.1858206</u>
Explained	<u>-.0192549</u>	<u>.0209897</u>	<u>.0122887</u>	<u>-.0394637</u>	<u>.0123419</u>	<u>.0388617</u>
Unexplained	<u><u>-.1068785</u></u>	<u><u>-.115254</u></u>	<u><u>-.0915403</u></u>	<u><u>.0947871</u></u>	<u><u>.0542852</u></u>	<u><u>.146959</u></u>

⁷ Not all countries present data on apprenticeship. Sweden does not provide data for *Type of employment contract* at all.

If we consider hourly earnings (Table 5.2) we obtain a similar picture. However a (tiny) wage premium shows up for males in Italy and generally public sector workers are better off vis-à-vis the monthly earnings case (Germany is an exception to this rule).

Table 5.2- Oaxaca-Blinder decomposition (hourly earnings)

	Total	Males	Females	Total	Males	Females
	ITALY			FRANCE		
Gap	<u>.2890000</u>	<u>.2260000</u>	<u>.4070000</u>	<u>-.0125158</u>	<u>.068594</u>	<u>-.0231887</u>
Explained	<u>.2380000</u>	<u>.2200000</u>	<u>.2850000</u>	<u>-.0110122</u>	<u>.0245745</u>	<u>-.0363521</u>
Unexplained	<u>.0510000</u>	<u>.0010000</u>	<u>.1220000</u>	<u>.023528</u>	<u>.0440195</u>	<u>-.0131634</u>
	GERMANY			SPAIN		
Gap	<u>-.1160000</u>	<u>-.0910000</u>	<u>-.0430000</u>	<u>.2417481</u>	<u>.2012673</u>	<u>.3461385</u>
Explained	<u>-.0520000</u>	<u>-.0070000</u>	<u>-.0120000</u>	<u>.193639</u>	<u>.1685474</u>	<u>.2787115</u>
Unexplained	<u>-.0640000</u>	<u>-.0850000</u>	<u>-.0310000</u>	<u>.0481091</u>	<u>.0327199</u>	<u>.067427</u>
	SWEDEN			UK		
Gap	<u>-.1174689</u>	<u>-.0901618</u>	<u>-.0702898</u>	<u>.1328537</u>	<u>.1359358</u>	<u>.2433528</u>
Explained	<u>-.0159638</u>	<u>.0213055</u>	<u>.0132259</u>	<u>-.0079459</u>	<u>.0332651</u>	<u>.0496236</u>
Unexplained	<u>-.1015050</u>	<u>-.1114674</u>	<u>-.0835157</u>	<u>.1407996</u>	<u>.1026708</u>	<u>.1937292</u>

Summing up, the results of Oaxaca-Blinder decomposition show the existence of a public sector wage premium in Italy, Spain and UK, and of a negative premium in France, Germany and Sweden.

One of the main limits of Oaxaca-Blinder decomposition model is that its results represent only mean values that may not represent adequately all the employees. There are several ways to deal with heterogeneity. We first present results obtained the \tilde{N} opo approach for the whole sample and then proceed to disaggregation by subgroups.

5.b) The \tilde{N} opo approach (whole sample)

In all the tables presenting the \tilde{N} opo approach, D is the total gap, the difference between mean wages of the comparing groups. It is expressed as a percentage of the mean wage for the LPE's group. D0 is the unexplained part of the gap (the premium). D_{pub} is the part of the gap that can be explained by the differences in characteristics between two groups of the individuals from the public sector, that are in and out of the common support of the variables defined by matching variables. D_{LPE} is the part of the gap that can be explained by the differences in characteristics between two groups of the individuals from LPE's that are in and out of the common support of the variables defined by matching variables. DX is the part of the gap that can be explained by differences in the distribution of characteristics of the two groups (public sector and LPE's) in the common support defined by the matching variables. Note that $D = D0 + D_{pub} + D_{LPE} + DX$. The outcome is expressed as a percentage of the mean wage for the LPE's group. Confidence intervals are only available for D0, to whose values apply the same underlining conventions described for the Oaxaca-Blinder decomposition.

The results based on monthly earnings (Table 5.3) now show the existence of a negative wage premium also for public sector workers for Italy (not for females) and Spain. The UK remains the only country with a pervasive positive premium.

Table 5.3- \tilde{N} opo approach (monthly earnings)

	Total	Males	Females	Total	Males	Females
	ITALY			FRANCE		

D	.0570000	.1070000	.1240000	-.06185252	-.02934589	-.01069219
D0	<u>-.0080000</u>	<u>-.0310000</u>	<u>.0530000</u>	<u>-.0352222</u>	<u>-.0291268</u>	<u>-.0378240</u>
D_{pub}	-.0020000	.0540000	-.0240000	.06232879	.09403642	.04346220
D_{LPE}	-.0110000	-.0170000	-.0040000	-.02026076	-.02679850	-.02021362
DX	.0800000	.1010000	.0990000	-.06869834	-.06745697	.00388324
GERMANY			SPAIN			
D	-.1000000	-.0710000	-.0300000	.16325298	.13873611	.28973759
D0	<u>-.1230000</u>	<u>-.1360000</u>	<u>-.0790000</u>	<u>-.03934492</u>	<u>-.05403355</u>	<u>-.01010534</u>
D_{pub}	.0020000	.0150000	.0000000	.05105074	.06916960	.04274222
D_{LPE}	-.0010000	-.0010000	-.0020000	-.01484169	-.01933237	-.01250585
DX	.0210000	.0500000	.0500000	.16638885	.14293244	.26960655
SWEDEN			UK			
D	-.13963779	-.0990133	-.09989697	-.01580924	.01606537	.13660015
D0	<u>-.11262985</u>	<u>-.1197474</u>	<u>-.09433086</u>	<u>-.02503304</u>	<u>-.00612662</u>	<u>-.08357068</u>
D_{pub}	.03058845	.04001052	.04166997	.00975603	.01997955	.00231095
D_{LPE}	-.00799272	-.00971365	-.00604058	-.03666501	-.04369534	-.01779225
DX	-.04960366	-.00956277	-.04119550	-.01393330	.03365454	.06851077

Considering hourly earnings (Table 5.4) we obtain a partially different picture: a positive wage premium in the public sector reappears in the aggregate results for Italy and Spain.

Table 5.4- *Ñopo approach decomposition* (hourly earnings)

	Total	Males	Females	Total	Males	Females
ITALY			FRANCE			
D	.3260000	.2750000	.4950000	-.01382602	.0096016	.04158286
D0	<u>-.0140000</u>	<u>-.0120000</u>	<u>-.0820000</u>	<u>-.01942605</u>	<u>-.01716437</u>	<u>-.02040258</u>
D_{pub}	.2090000	.1930000	.2570000	.06943164	.09981172	.0512175
D_{LPE}	-.0120000	-.0170000	-.0030000	-.01724262	-.02336937	-.01701396
DX	.1140000	.1110000	.1590000	-.04658899	-.04967638	.0277819
GERMANY			SPAIN			
D	-.1220000	-.0950000	-.0520000	.25287314	.22124895	.38493552
D0	<u>-.1360000</u>	<u>-.1490000</u>	<u>-.0920000</u>	<u>-.00706300</u>	<u>-.00566087</u>	<u>-.03169438</u>
D_{pub}	-.0000000	.0120000	-.0030000	.06126476	.08159551	.05112876
D_{LPE}	-.0010000	-.0010000	-.0020000	-.01563041	-.02026990	-.01265849
DX	.0150000	.0420000	.0450000	.20017580	.16558421	.31477087
SWEDEN			UK			
D	-.13439707	-.09795716	-.09343456	.04618953	.06558401	.19598813
D0	<u>-.10976465</u>	<u>-.11768061</u>	<u>-.08953790</u>	<u>-.08372492</u>	<u>-.06891999</u>	<u>-.12766255</u>
D_{pub}	.03112102	.04048260	.04109397	.01331410	.01843922	.01108626
D_{LPE}	-.00814155	-.00989635	-.00604893	-.04341754	-.05282195	-.01787467
DX	-.04761189	-.01086281	-.03894170	-.00743195	.03104675	.07511399

Summing up, the results from the *Ñopo* approach are less favourable for public sector workers. They are (slightly) worse off than in the Oaxaca-Blinder case.

5.c) *The Oaxaca-Blinder decomposition (educational-attainment samples)*

We now proceed to the results obtained separating the sample in three levels of educational attainment. We consider three distinct groups of educational attainment, in order to simplify our analysis and to make international comparisons more reliable. In fact, Germany provides data for educational attainment considering only three groups (instead of the traditional six ISCED levels) and we reproduce the same classification for all countries.

These results basically show that the level of educational attainment has a systematic impact on the wage premium. Generally, in line with most of the available evidence, less educated employees are relatively better off in the public sector than in LPE's.

For employees with level A of education (Table 5.5a) there are widespread wage premia (expecting Germany and Sweden). When we consider hourly earnings (Table 5.5b), these premia invariably increase.

Table 5.5a- Oaxaca-Blinder decomposition for level A of education (monthly earnings)

	Total	Males	Females	Total	Males	Females
	ITALY			FRANCE		
Gap	<u>.048006</u>	<u>.0498042</u>	<u>-.099971</u>	<u>.1034673</u>	<u>.1833072</u>	<u>.0261545</u>
Explained	<u>-.0177417</u>	<u>.0151425</u>	<u>-.0341568</u>	<u>-.0258301</u>	<u>.0806998</u>	<u>-.0976152</u>
Unexplained	<u>.0657476</u>	<u>.0346616</u>	<u>.1341277</u>	<u>.1292974</u>	<u>.1026075</u>	<u>.1237697</u>
	GERMANY			SPAIN		
Gap	<u>-.2235609</u>	<u>-.1862791</u>	<u>-.203054</u>	<u>.0778124</u>	<u>.0524214</u>	<u>.1389288</u>
Explained	<u>-.2106568</u>	<u>-.1505933</u>	<u>-.2092227</u>	<u>.0004866</u>	<u>.0482234</u>	<u>.048606</u>
Unexplained	<u>-.0129041</u>	<u>-.0356858</u>	<u>.0061687</u>	<u>.0004478</u>	<u>.0041979</u>	<u>.0903228</u>
	SWEDEN			UK		
Gap	<u>-.1520277</u>	<u>-.1327003</u>	<u>-.1143047</u>	<u>-.0440461</u>	<u>.0382718</u>	<u>.1696276</u>
Explained	<u>-.057796</u>	<u>-.0335745</u>	<u>-.0363273</u>	<u>-.0736084</u>	<u>-.0334296</u>	<u>-.01537</u>
Unexplained	<u>-.0942317</u>	<u>-.0991258</u>	<u>-.0779774</u>	<u>.1176545</u>	<u>.0717015</u>	<u>.1849976</u>

Table 5.5b- Oaxaca-Blinder decomposition for level A of education (hourly earnings)

	Total	Males	Females	Total	Males	Females
	ITALY			FRANCE		
Gap	<u>.1037355</u>	<u>.0888973</u>	<u>.1692572</u>	<u>.1040352</u>	<u>.1785275</u>	<u>.0318004</u>
Explained	<u>.0162459</u>	<u>.0330272</u>	<u>.0142096</u>	<u>-.0331854</u>	<u>.0667865</u>	<u>-.0996745</u>
Unexplained	<u>.0874896</u>	<u>.0558701</u>	<u>.1550476</u>	<u>.1372206</u>	<u>.1117409</u>	<u>.1314749</u>
	GERMANY			SPAIN		
Gap	<u>-.2436697</u>	<u>-.2068797</u>	<u>-.224853</u>	<u>.1633555</u>	<u>.1353316</u>	<u>.2260325</u>
Explained	<u>-.2211012</u>	<u>-.1646439</u>	<u>-.2180616</u>	<u>.0607567</u>	<u>.0570565</u>	<u>.0776902</u>
Unexplained	<u>-.0225685</u>	<u>-.0422358</u>	<u>-.0067914</u>	<u>.1025989</u>	<u>.0782751</u>	<u>.1483423</u>
	SWEDEN			UK		
Gap	<u>-.1502525</u>	<u>-.136748</u>	<u>-.1089123</u>	<u>.1180488</u>	<u>.1001055</u>	<u>.2172703</u>
Explained	<u>-.0547719</u>	<u>-.0352815</u>	<u>-.0321755</u>	<u>-.035262</u>	<u>-.0078879</u>	<u>-.0080097</u>
Unexplained	<u>-.0954806</u>	<u>-.1014665</u>	<u>-.0767369</u>	<u>.1533108</u>	<u>.1079934</u>	<u>.22528</u>

For employees with level B of education (Tables 5.6a-5.6b) the public sector wage premium follows the same pattern as above, but with smaller size and significance, especially if monthly earnings are considered.

Table 5.6a- Oaxaca-Blinder decomposition for level B of education (monthly earnings)

	Total	Males	Females	Total	Males	Females
ITALY			FRANCE			
Gap	<u>-.045993</u>	<u>-.0604573</u>	<u>.0572008</u>	<u>-.0413631</u>	<u>.0181501</u>	<u>-.0353423</u>
Explained	<u>-.0664114</u>	<u>-.0328264</u>	<u>-.0508141</u>	<u>-.0353706</u>	<u>-.0018698</u>	<u>.0065932</u>
Unexplained	<u>.0204184</u>	<u>-.0276309</u>	<u>.108015</u>	<u>-.0059925</u>	<u>.0200199</u>	<u>-.0419355</u>
GERMANY			SPAIN			
Gap	<u>-.103619</u>	<u>-.1130876</u>	<u>-.0197526</u>	<u>.0632242</u>	<u>.0882011</u>	<u>.1576118</u>
Explained	<u>-.0504454</u>	<u>-.0351823</u>	<u>-.0018212</u>	<u>.0464977</u>	<u>.0917053</u>	<u>.1126673</u>
Unexplained	<u>-.0531736</u>	<u>-.0779052</u>	<u>-.0179313</u>	<u>.0167265</u>	<u>-.0035043</u>	<u>.0449445</u>
SWEDEN			UK			
Gap	<u>-.174614</u>	<u>-.139134</u>	<u>-.1246307</u>	<u>.0373532</u>	<u>.0387061</u>	<u>.1755474</u>
Explained	<u>-.0946927</u>	<u>-.045538</u>	<u>-.0689739</u>	<u>-.0610539</u>	<u>-.0028231</u>	<u>-.003173</u>
Unexplained	<u>-.0799213</u>	<u>-.093595</u>	<u>-.0556568</u>	<u>.0984072</u>	<u>.0415291</u>	<u>.1787204</u>

Table 5.6b- Oaxaca-Blinder decomposition for level B of education (hourly earnings)

	Total	Males	Females	Total	Males	Females
ITALY			FRANCE			
Gap	<u>.1404174</u>	<u>.0462461</u>	<u>.2893315</u>	<u>-.0164971</u>	<u>.043069</u>	<u>-.0154959</u>
Explained	<u>.0901457</u>	<u>.0445262</u>	<u>.1593888</u>	<u>-.0215013</u>	<u>.0047625</u>	<u>.0234523</u>
Unexplained	<u>.0502717</u>	<u>.0017199</u>	<u>.1299427</u>	<u>.0050042</u>	<u>.0383065</u>	<u>-.0389482</u>
GERMANY			SPAIN			
Gap	<u>-.1202929</u>	<u>-.1336264</u>	<u>-.0312807</u>	<u>.1416837</u>	<u>.15549</u>	<u>.2398201</u>
Explained	<u>-.0583657</u>	<u>-.0473391</u>	<u>-.0059896</u>	<u>.070383</u>	<u>.1005425</u>	<u>.143812</u>
Unexplained	<u>-.0619272</u>	<u>-.0862874</u>	<u>-.0252911</u>	<u>.0713007</u>	<u>.0549475</u>	<u>.0960081</u>
SWEDEN			UK			
Gap	<u>-.1610424</u>	<u>-.1352211</u>	<u>-.1073094</u>	<u>.1120404</u>	<u>.1055197</u>	<u>.2254253</u>
Explained	<u>-.0883399</u>	<u>-.0459689</u>	<u>-.0635698</u>	<u>-.0373746</u>	<u>.0087228</u>	<u>-.0021398</u>
Unexplained	<u>-.0727025</u>	<u>-.0892522</u>	<u>-.0437396</u>	<u>.149415</u>	<u>.0967968</u>	<u>.2275651</u>

Finally, when we consider the employees with level C of education (Tables 5.7a-5.7b), we observe that, with monthly earnings, a public sector wage penalty appears in many situations. Female workers, especially in Italy and UK, do not conform to this evolution. When we consider hourly earnings the situation changes very little.

Table 5.7a- Oaxaca-Blinder decomposition for level C of education (monthly earnings)

	Total	Males	Females	Total	Males	Females
ITALY			FRANCE			
Gap	<u>-.0443292</u>	<u>.0355685</u>	<u>.0312139</u>	<u>-.261372</u>	<u>-.2182231</u>	<u>-.1759063</u>
Explained	<u>-.0684607</u>	<u>.0681098</u>	<u>-.0694049</u>	<u>-.2054178</u>	<u>-.1451396</u>	<u>-.1359991</u>
Unexplained	<u>.0241314</u>	<u>-.0325412</u>	<u>.1006188</u>	<u>-.0559542</u>	<u>-.0730835</u>	<u>-.0399072</u>
GERMANY			SPAIN			
Gap	<u>-.3869651</u>	<u>-.2659124</u>	<u>-.3639496</u>	<u>.0420382</u>	<u>.0129937</u>	<u>.129062</u>
Explained	<u>-.2786125</u>	<u>-.1524373</u>	<u>-.2807022</u>	<u>.0668388</u>	<u>.0597225</u>	<u>.1299651</u>

Unexplained	<u>-.1083526</u>	<u>-.1134751</u>	<u>-.0832474</u>	<u>-.0248006</u>	<u>-.0467288</u>	<u>-.0009031</u>
	SWEDEN			UK		
Gap	<u>-.2094792</u>	<u>-.177929</u>	<u>-.1481458</u>	<u>-.0045953</u>	<u>.0198747</u>	<u>.1248532</u>
Explained	<u>-.0886569</u>	<u>-.0353858</u>	<u>-.0449604</u>	<u>-.0832697</u>	<u>-.0391348</u>	<u>.0235946</u>
Unexplained	<u>-.1208224</u>	<u>-.1425432</u>	<u>-.1031854</u>	<u>.0786744</u>	<u>.0590095</u>	<u>.1012586</u>

Table 5.7b- Oaxaca-Blinder decomposition for level C of education (hourly earnings)

	Total	Males	Females	Total	Males	Females
	ITALY			FRANCE		
Gap	<u>.2725093</u>	<u>.2679885</u>	<u>.3923091</u>	<u>-.1723046</u>	<u>-.1248514</u>	<u>-.1030085</u>
Explained	<u>.2307493</u>	<u>.2736422</u>	<u>.2887141</u>	<u>-.1484922</u>	<u>-.0920095</u>	<u>-.0840882</u>
Unexplained	<u>.04176</u>	<u>-.0056538</u>	<u>.1035949</u>	<u>-.0238124</u>	<u>-.0328419</u>	<u>-.0189203</u>
	GERMANY			SPAIN		
Gap	<u>-.4123435</u>	<u>-.2912446</u>	<u>-.3897471</u>	<u>.1038992</u>	<u>.0737044</u>	<u>.1857506</u>
Explained	<u>-.2902238</u>	<u>-.163866</u>	<u>-.2923515</u>	<u>.1124001</u>	<u>.0963376</u>	<u>.1775796</u>
Unexplained	<u>-.1221197</u>	<u>-.1273786</u>	<u>-.0973956</u>	<u>-.0085009</u>	<u>-.0226331</u>	<u>.008171</u>
	SWEDEN			UK		
Gap	<u>-.2030638</u>	<u>-.1720297</u>	<u>-.1431248</u>	<u>.0654028</u>	<u>.0797094</u>	<u>.1873412</u>
Explained	<u>-.0874286</u>	<u>-.0336792</u>	<u>-.0457032</u>	<u>-.0591595</u>	<u>-.0243694</u>	<u>.0375034</u>
Unexplained	<u>-.1156352</u>	<u>-.1383505</u>	<u>-.0974217</u>	<u>.1245623</u>	<u>.1040788</u>	<u>.1498378</u>

On the whole, the public sector wage premium is more sizeable for low-educated employees than high-educated employees. This is consistent with a stronger role played in wage determination by trade unions in the public sector.

In Tables 5.8a-5.8b we consider the main results from Ñopo approach for level A of education.

Table 5.8a- Ñopo approach for level A of education (monthly earnings)

	Total	Males	Females	Total	Males	Females
	ITALY			FRANCE		
D	.02401922	.02793530	.081609	.08997984	.16697228	.01628135
D0	<u>-.02023043</u>	<u>-.01752977</u>	<u>-.029178</u>	<u>-.05093124</u>	<u>-.03747972</u>	<u>-.08532434</u>
D _{pub}	-.03449620	-.04164584	-.002292	.02376852	.00688221	.06568119
D _{LPE}	.00157622	-.00094177	-.014938	-.05600918	-.05459386	-.07682066
DX	.03670878	.05299314	.069661	.07128925	.17720421	-.05790351
	GERMANY			SPAIN		
D	-.18181276	-.14811733	-.17037128	.05848447	.04331947	.12193464
D0	<u>-.07088466</u>	<u>-.08399833</u>	<u>-.03852773</u>	<u>-.02069997</u>	<u>-.04175776</u>	<u>-.02664703</u>
D _{pub}	-.02015568	-.01957625	.00663438	-.01858787	-.02225139	.03088209
D _{LPE}	-.01677701	-.01416380	-.02628004	-.02426113	-.02894989	-.03689992
DX	-.07399541	-.03037895	-.11219789	.12203343	.13627851	.10130545
	SWEDEN			UK		
D	-.1468001	-.12519317	-.11822981	-.00371079	.00552835	.14517234
D0	<u>-.0975293</u>	<u>-.09809971</u>	<u>-.09371537</u>	<u>.05480359</u>	<u>.02007114</u>	<u>.17649085</u>
D _{pub}	-.0168868	-.00965603	.00391042	-.00745823	-.01104097	.03074519

D_{LPE}	-0.0185299	-0.02134054	-0.02682214	-0.11227048	-0.12282111	-0.11550709
DX	-0.0138540	.00390311	-0.00160272	.06121433	.1193193	.05344338

Table 5.8b- *Ñopo* approach for level A of education (hourly earnings)

	Total	Males	Females	Total	Males	Females
ITALY			FRANCE			
D	.08105856	.06498617	.16247134	.09804664	.17182598	.0267313
D0	<u>.04643136</u>	<u>.04250765</u>	<u>.05879174</u>	<u>.03841079</u>	<u>.02663374</u>	<u>.06836124</u>
D_{pub}	-0.01121251	-0.02105109	.01751925	.02730899	.01246913	.064816
D_{LPE}	-0.0008164	-0.00260034	-0.0153779	-0.04359217	-0.04241406	-0.06209047
DX	.04665611	.04612995	.10153824	.07591904	.17513716	-0.04435547
GERMANY			SPAIN			
D	-0.19907981	-0.16564349	-0.19143193	.15737543	.14001019	.22514416
D0	<u>-.08743040</u>	<u>-.09788891</u>	<u>-.06186918</u>	<u>.04278256</u>	<u>.02139663</u>	<u>.08870576</u>
D_{pub}	-0.02074545	-0.01986129	.00388426	-0.01419378	-0.02039965	.04089720
D_{LPE}	-0.01635392	-0.01379198	-0.02546325	-0.02612322	-0.03032495	-0.03859347
DX	-0.07455004	-0.03410132	-0.10798377	.15490987	.16933815	.13413467
SWEDEN			UK			
D	-0.1459456	-0.12955681	-0.11371968	.06695924	.06466529	.19436699
D0	<u>-.09737526</u>	<u>-.09713098</u>	<u>-.09650176</u>	<u>.09804266</u>	<u>.06512845</u>	<u>.20428577</u>
D_{pub}	-0.01494145	-0.01104407	.00747218	.01167768	.0078698	.04116156
D_{LPE}	-0.01859329	-0.02125739	-0.02668962	-0.12678878	-0.13765071	-0.12031344
DX	-0.01503559	-0.00012437	.00199952	.08402767	.12931775	.06923309

In Tables 5.9a-5.9b we consider the main results from *Ñopo* approach for level B of education.

Table 5.9a- *Ñopo* approach for level B of education (monthly earnings)

	Total	Males	Females	Total	Males	Females
ITALY			FRANCE			
D	-0.09340329	-0.08782847	.0095676	-0.07279653	-.020818	-0.05540554
D0	<u>-.01056874</u>	<u>-.03983059</u>	<u>.06349321</u>	<u>-.00635011</u>	<u>-.00252076</u>	<u>-.01425038</u>
D_{pub}	-0.05848731	-0.02952255	-0.06644555	.02146981	.01771727	.02987993
D_{LPE}	-0.02347430	-0.02800798	-0.01291061	-0.04342983	-0.0464909	-0.03972047
DX	-0.00087295	.00953265	.02543056	-.0444864	.0104764	-0.03131462
GERMANY			SPAIN			
D	-0.12924832	-0.13009643	-.05319977	.05739773	.10160436	.1515082
D0	<u>-.11486790</u>	<u>-.13185028</u>	<u>-.06627123</u>	<u>-.03077443</u>	<u>-.05043050</u>	<u>.01362310</u>
D_{pub}	-0.00633283	-0.0050746	-0.00326983	.04624173	.01406033	.11095535
D_{LPE}	-0.00145237	-0.00131848	-0.00243005	-0.0299781	-0.02354146	-0.04873129
DX	-0.00659522	.00814693	.01877135	.07190853	.161516	.07566104
SWEDEN			UK			
D	-0.18050865	-0.14341932	-0.13844683	-0.0358261	-0.02131912	.13361361
D0	<u>-.08593951</u>	<u>-.09104829</u>	<u>-.07076812</u>	<u>.02762527</u>	<u>.00614887</u>	<u>.09518611</u>
D_{pub}	-0.01799886	-0.01980387	-0.0003598	.00861094	.00836709	.02187311

D_{LPE}	-0.01314201	-0.0137888	-0.0154087	-0.06845341	-0.0746324	-0.04703091
DX	-0.06342827	-0.01877836	-0.05191021	-0.0036089	.03879732	.0635853

Table 5.9b- *Ñopo* approach for level A of education (hourly earnings)

	Total	Males	Females	Total	Males	Females
ITALY			FRANCE			
D	.1125767	.02601349	.30687459	-.03904516	.01654922	-.02957707
$D0$	<u>-.01237088</u>	<u>-.0215741</u>	<u>-.09693479</u>	<u>.00218584</u>	<u>.00695015</u>	<u>-.00748233</u>
D_{pub}	.106109	.05526469	.1760728	.02398514	.02034254	.03211949
D_{LPE}	-.02345945	-.02807265	-.01280867	-.03508384	-.03776205	-.03195795
DX	.01755626	.02039555	.04667566	-.0301323	.02701858	-.02225628
GERMANY			SPAIN			
D	-.14437864	-.14821602	-.06472821	.14125152	.17562613	.24931171
$D0$	<u>-.1294755</u>	<u>-.14755733</u>	<u>-.07763543</u>	<u>.01905789</u>	<u>.00202259</u>	<u>.05695135</u>
D_{pub}	-.00639346	-.00504582	-.00384639	.06355273	.03524894	.12432476
D_{LPE}	-.00133298	-.00119052	-.00234132	-.03082892	-.02464339	-.0487035
DX	-.0071767	.00557765	.01909493	.08946981	.16299799	.1167391
SWEDEN			UK			
D	-.17078253	-.1420812	-.12376686	.01851619	.02220437	.18181858
$D0$	<u>-.08318440</u>	<u>-.08892654</u>	<u>-.06628305</u>	<u>.09668553</u>	<u>.08215785</u>	<u>-.1407426</u>
D_{pub}	-.01622085	-.01963506	.00097388	.01751907	.00913839	.03812493
D_{LPE}	-.01328358	-.01396253	-.01532374	-.0894433	-.10292035	-.04705374
DX	-.05809369	-.01955707	-.04313395	-.00624511	.03382849	.05000479

In Tables 5.10a-5.10b we consider the main results from *Ñopo* approach for level C of education.

Table 5.10a- *Ñopo* approach for level C of education (monthly earnings)

	Total	Males	Females	Total	Males	Females
ITALY			FRANCE			
D	-.05200144	.05266709	.01730264	-.26136249	-.21421399	-.19719475
$D0$	<u>-.04689332</u>	<u>-.09294155</u>	<u>-.04996561</u>	<u>-.10602854</u>	<u>-.11310167</u>	<u>-.08730972</u>
D_{pub}	-.08325287	-.03408279	-.09500353	-.04787557	-.12551027	.03503737
D_{LPE}	-.02654458	-.02369188	-.02801044	-.01387406	-.01024641	-.03154548
DX	.10468933	.20338332	.09035099	-.09358433	.03464436	-.11337691
GERMANY			SPAIN			
D	-.29075233	-.21503647	-.27567755	.02928649	.015607	.11939886
$D0$	<u>-.15663972</u>	<u>-.15859156</u>	<u>-.14645346</u>	<u>-.06172823</u>	<u>-.06914492</u>	<u>-.05048948</u>
D_{pub}	-.10167796	-.09300013	-.08846751	.05825455	.08426662	.03933556
D_{LPE}	.00147001	-.00017364	.00521863	-.01454117	-.01368765	-.01174208
DX	-.03390466	.03672887	-.04597521	.04730133	.01417295	.14229485
SWEDEN			UK			
D	-.2242545	-.18606441	-.1713946	-.07036154	-.02352485	.06296993
$D0$	<u>-.15701865</u>	<u>-.17576119</u>	<u>-.1211933</u>	<u>.01687173</u>	<u>.00366624</u>	<u>-.0561498</u>

D_{pub}	.01382748	.01778006	.01976409	.02962167	.03681227	.01699888
D_{LPE}	-.00983998	-.00894142	-.0089828	-.00924992	-.01443757	.00470799
DX	-.07122334	-.01914187	-.0609826	-.10760502	-.04956579	-.01488673

Table 5.10b- *Ñopo* approach for level C of education (hourly earnings)

	Total	Males	Females	Total	Males	Females
	ITALY			FRANCE		
D	.253416	.26927542	.44031244	-.18649302	-.13365531	-.12779931
D0	<u>-.03195693</u>	<u>-.07698447</u>	<u>.06214603</u>	<u>-.0752249</u>	<u>-.08060773</u>	<u>-.06146616</u>
D_{pub}	.14388626	.16249252	.18174801	-.0364157	-.11609147	.04875087
D_{LPE}	-.02673894	-.02472643	-.02651039	-.01556025	-.01152516	-.03303955
DX	.1682256	.20849381	.2229288	-.05929217	.07456905	-.08204448
	GERMANY			SPAIN		
D	-.30737233	-.23404384	-.29217846	.09252114	.07623727	.18045065
D0	<u>-.16574872</u>	<u>-.16680171</u>	<u>-.15991538</u>	<u>-.03286385</u>	<u>-.03891578</u>	<u>-.02380543</u>
D_{pub}	-.09843717	-.09063896	-.0844271	.06451257	.09234308	.04533567
D_{LPE}	.00143463	-.00017434	.00502431	-.01570745	-.01460659	-.01368567
DX	-.04462106	.02357117	-.0528603	.07657987	.03741656	.17260608
	SWEDEN			UK		
D	-.22224342	-.18556376	-.16911935	-.01485466	.01818799	.12317717
D0	<u>-.1533737</u>	<u>-.17341144</u>	<u>-.11510878</u>	<u>.06519855</u>	<u>.0530652</u>	<u>.10016391</u>
D_{pub}	.01452484	.01793213	.02070969	.03169864	.03231086	.025991
D_{LPE}	-.0100004	-.00917151	-.00903481	-.00244407	-.00497337	.00352393
DX	-.07339415	-.02091293	-.06568544	-.10930779	-.06221471	-.00650167

Once again, the public sector wage premium is more sizeable for low-educated employees than high-educated employees. However, like in 5.b), public sector workers are slightly worse off with the *Ñopo* approach than with the Oaxaca-Blinder decomposition.

5.d) The Oaxaca-Blinder decomposition (sector-wide samples)

As repeatedly said, we have other ways to deal with heterogeneity or better to face the criticism that the comparison of all public workers with all private workers does not make sense since some works can exist only in the public sector and other works cannot exist there. We carry out the public-private comparison only within sectors in which there are both public and private employers. To this end we consider the Education, Health and Utilities sectors defined in Section 3.

For a correct comparison we have to make some caveats. First of all, especially for Education sector, the number of LPE's is limited, so the number of observations for employees in LPE's is very low and the statistical significance of data is not always guaranteed. Furthermore, there are problems of measurement for hourly earnings (mostly in Education),⁸ especially in Italy.⁹ Finally, even in these sector-wide samples we cannot exclude a priori some problems of comparability.

⁸ Similar problems are also stressed in Giordano *et al.* (2011).

⁹ In Italy the SES data on earnings for public employees mostly come from administrative sources; these sources do not report information about the number of hours paid, so the database reports primarily contractual working hours that could underestimate significantly actual working hours, especially in Education. Moreover, note that SES does not report the data on hourly earnings for Italy and Sweden, so they are estimated as a ratio between monthly earnings and number of hours paid. As a consequence, the probable underestimation of the number of hours paid in Italy would imply an overestimation of hourly earnings for public sector workers in this country. Matters are less clear *a*

In any case, for the Education sector (Tables 5.11a-5.11b) we observe a very different situation respect the picture described for the aggregated data. The most important difference regards Germany where we now witness very high values for the public sector wage premium. In this country the wage gap seems very high: males working into the public sector earn three times the colleagues in the LPE's (1.097 log points represents a gap of 109.5%). When we consider the wage premium the differences are reduced but always consistent (0.148 log points or 16.0%).

Other important differences with the aggregate estimates are represented by the absence of a wage premium for public employees in UK and for employees in LPE's in Sweden. In Spain and Italy there is a wage premium for female employees in the public sector; in Italy this premium appears very consistent (0.208 log points or 23.1%). Also in France there seems to be a wage premium for female public sector workers, but it is not statistically significant. The most important difference arising with the use of hourly earnings is the absence of wage premium for female public sector workers in Spain.

Table 5.11a - Oaxaca-Blinder decomposition for Education (monthly earnings)

	Total	Males	Females	Total	Males	Females
ITALY			FRANCE			
Gap	<u>.390</u>	.119	<u>.480</u>	.021	-.247	<u>.240</u>
Explained	<u>.264</u>	<u>.204</u>	<u>.272</u>	<u>.152</u>	<u>.136</u>	<u>.186</u>
Unexplained	<u>.126</u>	-.085	<u>.208</u>	-.131	-.384	.054
GERMANY			SPAIN			
Gap	<u>.848</u>	<u>1.097</u>	<u>.616</u>	-.014	-.012	-.017
Explained	<u>.615</u>	<u>.949</u>	<u>.361</u>	<u>-.042</u>	.001	<u>-.068</u>
Unexplained	<u>.232</u>	<u>.148</u>	<u>.255</u>	.028	-.014	<u>.051</u>
SWEDEN			UK			
Gap	<u>.066</u>	<u>.066</u>	<u>.068</u>	-.055	-.044	-.042
Explained	<u>.089</u>	<u>.101</u>	<u>.078</u>	<u>-.042</u>	-.017	<u>-.037</u>
Unexplained	<u>-.023</u>	<u>-.035</u>	-.010	-.013	-.027	-.006

Table 5.11b - Oaxaca-Blinder decomposition for Education (hourly earnings)

	Total	Males	Females	Total	Males	Females
ITALY			FRANCE			
Gap	<u>.689</u>	<u>.406</u>	<u>.783</u>	.076	-.126	<u>.246</u>
Explained	<u>.436</u>	<u>.232</u>	<u>.483</u>	<u>.151</u>	<u>.132</u>	<u>.185</u>
Unexplained	<u>.252</u>	.174	<u>.300</u>	<u>-.075</u>	-.258	.060
GERMANY			SPAIN			
Gap	<u>.818</u>	<u>1.065</u>	<u>.587</u>	<u>-.079</u>	-.048	<u>-.098</u>
Explained	<u>.597</u>	<u>.928</u>	<u>.345</u>	<u>-.050</u>	-.002	<u>-.076</u>
Unexplained	<u>.220</u>	<u>.137</u>	<u>.242</u>	-.029	-.046	-.022
SWEDEN			UK			
Gap	<u>.074</u>	<u>.072</u>	<u>.078</u>	-.013	-.012	.001

priori for Sweden. More precisely, in Italy, for the public sector, the Italian National Institute of Statistics (Istat) does not use a specific questionnaire but uses several, different, sources (administrative and fiscal data and some other different statistic datasets). Especially for Education the datasets used by Istat do not provide information on the number of hours paid in public school; therefore Istat uses as a proxy the contractual working hours, that are lower than the hours actually worked. As a result there is an overestimation of the data on hourly earnings (see Istat 2010 and Istat 2013).

Explained	<u>.096</u>	<u>.103</u>	<u>.088</u>	<u>-.045</u>	<u>-.029</u>	<u>-.042</u>
Unexplained	<u>-.022</u>	<u>-.031</u>	<u>-.010</u>	<u>.032</u>	<u>.017</u>	<u>.042</u>

Also for Health (Tables 5.12a-5.12b) we register some significant differences vis-à-vis the aggregate estimates. In Italy, Spain and UK we see a significant wage premium for public employees, both males and females. Also in Germany there is a public sector wage premium, but this premium is much smaller than in the previous three countries. The picture is more or less the same when we consider hourly earnings instead of monthly earnings.

To better understand these results we must remember that in Health there are also the social care activities or social services, generally performed by private (for-profit or non-profit institutions), often characterised by a high presence of females, low paid jobs and high turnover (Eurofound, 2006). To investigate these problems we need more specific analyses that exceed the scope of this work.

Table 5.12a - Oaxaca-Blinder decomposition for Health (monthly earnings)

	Total	Males	Females	Total	Males	Females
ITALY			FRANCE			
Gap	<u>.522</u>	<u>.447</u>	<u>.491</u>	<u>.000</u>	<u>.124</u>	<u>-.050</u>
Explained	<u>.244</u>	<u>.204</u>	<u>.189</u>	<u>.012</u>	<u>.082</u>	<u>-.013</u>
Unexplained	<u>.278</u>	<u>.243</u>	<u>.302</u>	<u>-.011</u>	<u>.042</u>	<u>-.038</u>
GERMANY			SPAIN			
Gap	<u>.064</u>	<u>.075</u>	<u>.068</u>	<u>.405</u>	<u>.435</u>	<u>.389</u>
Explained	<u>.027</u>	<u>.039</u>	<u>.031</u>	<u>.205</u>	<u>.245</u>	<u>.183</u>
Unexplained	<u>.037</u>	<u>.036</u>	<u>.037</u>	<u>.199</u>	<u>.190</u>	<u>.205</u>
SWEDEN			UK			
Gap	<u>.081</u>	<u>.124</u>	<u>.064</u>	<u>.459</u>	<u>.563</u>	<u>.405</u>
Explained	<u>.169</u>	<u>.251</u>	<u>.136</u>	<u>.233</u>	<u>.318</u>	<u>.318</u>
Unexplained	<u>-.088</u>	<u>-.127</u>	<u>-.072</u>	<u>.226</u>	<u>.245</u>	<u>.245</u>

Table 5.12b - Oaxaca-Blinder decomposition for Health (hourly earnings)

	Total	Males	Females	Total	Males	Females
ITALY			FRANCE			
Gap	<u>.526</u>	<u>.460</u>	<u>.497</u>	<u>-.001</u>	<u>.115</u>	<u>-.04</u>
Explained	<u>.236</u>	<u>.201</u>	<u>.184</u>	<u>.011</u>	<u>.078</u>	<u>-.011</u>
Unexplained	<u>.289</u>	<u>.259</u>	<u>.312</u>	<u>-.012</u>	<u>.037</u>	<u>-.037</u>
GERMANY			SPAIN			
Gap	<u>.062</u>	<u>.068</u>	<u>.068</u>	<u>.465</u>	<u>.504</u>	<u>.446</u>
Explained	<u>.025</u>	<u>.035</u>	<u>.029</u>	<u>.210</u>	<u>.248</u>	<u>.188</u>
Unexplained	<u>.037</u>	<u>.033</u>	<u>.040</u>	<u>.255</u>	<u>.256</u>	<u>.259</u>
SWEDEN			UK			
Gap	<u>.090</u>	<u>.127</u>	<u>.075</u>	<u>.521</u>	<u>.617</u>	<u>.472</u>
Explained	<u>.163</u>	<u>.246</u>	<u>.129</u>	<u>.226</u>	<u>.308</u>	<u>.183</u>
Unexplained	<u>-.073</u>	<u>-.119</u>	<u>-.054</u>	<u>.295</u>	<u>.309</u>	<u>.289</u>

Utilities are a reasonably homogeneous sector, which in many countries has undergone a process of deregulation and privatisation. For this sector (Table 5.13a-5.13b) we observe the presence of a general- although not very large- public sector wage premium in the monthly earnings of all

countries, with the only exception represented by Germany. In some cases the value for the premium is not statistically significant. The highest value is the premium for males in Spain: 0.080 log points or 8.3%. Another interesting feature of these results is that, unlike in the rest of the estimates, women workers fare worse than their male colleagues. With hourly earnings there is a consistent increase of the wage premium in Spain and UK (for males in Spain the wage premium is now equal to 0.158 log points or 17.1%) and the reduction of the public sector wage premium for Italy to a level close to zero (the wage premium is not statistically significant, both for males and females).

Table 5.13a - Oaxaca-Blinder decomposition for Utilities (monthly earnings)

	Total	Males	Females	Total	Males	Females
ITALY			FRANCE			
Gap	<u>.080</u>	<u>.071</u>	<u>.104</u>	<u>.130</u>	<u>.140</u>	<u>.069</u>
Explained	<u>.035</u>	<u>.025</u>	<u>.062</u>	<u>.080</u>	<u>.081</u>	<u>.057</u>
Unexplained	<u>.045</u>	<u>.046</u>	<u>.042</u>	<u>.050</u>	<u>.059</u>	<u>.012</u>
GERMANY			SPAIN			
Gap	<u>.010</u>	<u>-.007</u>	<u>.050</u>	<u>.178</u>	<u>.160</u>	<u>.176</u>
Explained	<u>.022</u>	<u>.005</u>	<u>.053</u>	<u>.103</u>	<u>.080</u>	<u>.114</u>
Unexplained	<u>-.013</u>	<u>-.013</u>	<u>-.003</u>	<u>.075</u>	<u>.080</u>	<u>.062</u>
SWEDEN			UK			
Gap	<u>.106</u>	<u>.127</u>	<u>.051</u>	<u>.090</u>	<u>.069</u>	<u>.183</u>
Explained	<u>.064</u>	<u>.079</u>	<u>.035</u>	<u>.038</u>	<u>.023</u>	<u>.102</u>
Unexplained	<u>.042</u>	<u>.048</u>	<u>.016</u>	<u>.052</u>	<u>.046</u>	<u>.081</u>

Table 5.13b - Oaxaca-Blinder decomposition for Utilities (hourly earnings)

	Total	Males	Females	Total	Males	Females
ITALY			FRANCE			
Gap	<u>.053</u>	<u>.044</u>	<u>.081</u>	<u>.167</u>	<u>.182</u>	<u>.089</u>
Explained	<u>.036</u>	<u>.026</u>	<u>.065</u>	<u>.087</u>	<u>.091</u>	<u>.061</u>
Unexplained	<u>.018</u>	<u>.019</u>	<u>.016</u>	<u>.079</u>	<u>.091</u>	<u>.028</u>
GERMANY			SPAIN			
Gap	<u>.015</u>	<u>.003</u>	<u>.040</u>	<u>.243</u>	<u>.229</u>	<u>.231</u>
Explained	<u>.023</u>	<u>.007</u>	<u>.054</u>	<u>.096</u>	<u>.071</u>	<u>.114</u>
Unexplained	<u>-.007</u>	<u>-.004</u>	<u>-.014</u>	<u>.147</u>	<u>.158</u>	<u>.117</u>
SWEDEN			UK			
Gap	<u>.107</u>	<u>.129</u>	<u>.049</u>	<u>.170</u>	<u>.159</u>	<u>.225</u>
Explained	<u>.065</u>	<u>.081</u>	<u>.035</u>	<u>.042</u>	<u>.026</u>	<u>.109</u>
Unexplained	<u>.042</u>	<u>.048</u>	<u>.014</u>	<u>.128</u>	<u>.132</u>	<u>.115</u>

Summing up, we have observed some differences between the aggregate estimates and the sector-wide estimates for three fundamental fields of public intervention, i.e. Education, Health and Utilities. Looking at Education we do not observe very significant differences between public sector and LPE's in Spain, Sweden and UK. The most striking results show up for Germany: contrary to what found at the aggregate level, there is a wage premium for public sector workers, especially in Education. In France and in Italy the results are more ambiguous and not always statistically significant. In Health, with the exception of Sweden and perhaps France, we observe a positive and high wage premium for public employees. In several cases this premium results particularly high

(Italy and Spain). In Utilities we observe also a positive wage premium for public employees, but in this case it is not very high (except for Spain and UK when we consider hourly earnings).

Therefore, these data yield a different picture than the one that emerged from the analysis for the whole economy. However, the problem of statistical significance pervades the comparison between public sector and LPE's for sector-wide data, especially for Education. This problem could derive from the reduced number of LPE's in the sectors. To overcome it we have also considered the data for the whole private sector (characterised by a higher number of observations), but no sizeable consequence has ensued. Results are available upon request.

5.e) Commenting the evidence

The whole-sample results show the existence of a public sector wage premium mostly in Spain and UK, both for monthly and hourly earnings, and in Italy mainly for hourly earnings. These results are consistent with the literature on the public-private differentials that has shown higher public wage premia when they are calculated on hourly earnings instead of monthly earnings (see, for example, Giordano *et al.*, 2011; Christofides and Michael, 2013). In the other countries a negative premium always shows up for public sector workers.¹⁰ Country-wise, our results are broadly consistent with those, also relying on the SES, of Ramos *et al.* (2014) for Spain, and of de Castro *et al.* (2013) for EU countries, and of some important former studies (Lucifora and Meurs, 2006; Brindusa *et al.*, 2011; Tepe *et al.*, 2011; Ghinetti and Lucifora, 2013; Dickson *et al.*, 2014) for the countries in our sample. Generally speaking, our countries provide a ranking of public wage premia going from UK to Spain, Italy, France, Germany, Sweden. The literature suggests that it is useful to distinguish national systems of pay regulation in the public services across three dimensions: first, the extent to which collective bargaining is subject to unilateral employer regulation (see Marsden, 1994), second, the degree of local wage negotiation either as part of national pay settlements or as a substitute to them (see OECD, 1993); and thirdly, the degree of integration of the system of pay determination across all employees in public services (see Rubery and Fagan 1994, 1995). Yet, inasmuch as unilateral employer regulation is concerned, countries in our sample do not differ very much. In the majority of countries, for those groups covered by collective bargaining, it is usual for the wage agreement to be subject to parliamentary approval or explicitly constrained by ministerial assessment of the implications for the state budget. The former condition is notable in Sweden and the UK and the latter condition applies in Italy, France and in Spain. Centralisation holds also very little promise as an explanation. Sweden stands out as the country where local pay determination is most strongly developed, and then one can rank UK, Germany, Spain, Italy and France (Grimshaw *et al.*, 2012). This ranking has little relation to that of our wage premia. The degree of integration is perhaps more promising. The UK public sector would stand out as being relatively fragmented, France would be located at the pole of relative integration. Spain, Sweden and Germany would not too far behind France. Italy might be placed in between the two poles.

When we consider separately sub-groups with different levels of educational attainment, we see that less-educated public sector workers are always, relatively, better off. The evidence also shows that in many cases a public sector wage premium exists only for some segment of female employees. All this is consistent in principle with a stronger role played by trade unions and collective bargaining in the public sector. Around 45 % of public sector employees in Italy are members of a union. In the UK, unionisation is much higher in the public than in the private sector. The right to strike in the public sector is in practice recognised. Also the fact that female public sector workers seem to fare less well in the UK than in other countries may be consistent with a recent loss in union membership in the British public sector. It should however be noted that in

¹⁰ In all countries there are not very large differences when we compare the public sector to private sector instead of LPE's. However, the evidence is always more favourable to the existence of a public sector wage premium when we consider the whole private sector. This is consistent with a stronger role played in wage determination by trade unions in the public sector and in LPE's. Results are available upon request.

highly unionised countries such as Sweden and, to a lesser extent, Germany, the skill-wage premium gradient is rather flat. Arguably, public sector unionisation matters less when the private sector is also highly unionised. The public sector wage penalties in France are also consistent with the capability of French private unions to rely on *erga omnes* legislation (very high union coverage, not applicable to the public sector: information on these matters can be gathered from <http://www.worker-participation.eu/>). More generally our findings suggest the need to consider jointly public and private labour-market institutions.

Another interesting point relates to pay reforms in the public sector of the countries under scrutiny: although diverse in timing and according to the institutional framework, they have a common pattern: decentralisation, more merit pay, more competition. Budgetary crises brought about a reduction in staff, and a decreasing public wage premium. There are however two few interesting exceptions (Meurs, 2012). In Sweden there was an early fiscal consolidation, with no budget crisis, and no specific employment status for civil servants. Deregulations, liberalisation and privatisations exposed previously protected activities to competition. In Germany there have been staff reduction (public sector employment went down by nearly a third) and wage constraint since 1992 (especially since the Debt Brake of 1999). More decentralised collective agreements since 2005-2006 brought about increasing differences in annual wages across Länder. Arguably as result of these events, in neither country there is a public wage premium.

We observe some interesting differences between the aggregate estimates and the sector-wide estimates for three fundamental fields of public intervention, i.e. Education, Health, and Utilities. Looking at Education we do not observe very significant differences between public sector and LPE's in Spain, Sweden and UK. On the other hand, public wage premia are fairly high for Health in Italy and Spain. The most striking results show up for Germany: contrary to what found at the aggregate level, there is a wage premium for public sector workers, especially in Education. An interesting feature of the results for Utilities (where we generally observe a small public wage premium) is that, unlike in the rest of the estimates, female public sector workers fare worse than their male colleagues. Sector-wide estimates suggest that rather different mechanisms of wage determination are at work in different segments of the public sector. These estimates are however beset by a problem of statistical significance, suggesting caution in the interpretation of their results.

6. Concluding remarks

In this paper we have presented some relatively novel evidence on the public-private wage gaps for six important European countries, using the Structure of Earnings Survey of 2010. We capture many countries in a transition period, with restructuring of the public sector under way. Our analysis extends to monthly earnings (going beyond the usually considered hourly earnings) and emphasises issues of comparability in several ways. We exclude NACE sector O (without comparable private sector workers) from our field of analysis, we poise public sector workers against their appropriate counterpart: employees from large private firms, we consider workers characterised by similar levels of education, we complement the customary Oaxaca-Blinder decomposition with that obtained from Ñopo's matching approach, and we consider jobs and professional figures within some sectors (Education, Health, and utilities) taken separately.

On the whole, the public sector wage premium seems to be more sizeable for females than males, for less-educated employees than highly-educated employees and when we consider hourly earnings instead of monthly earnings. Country-wise, our results are largely consistent with a stronger role played by trade unions and collective bargaining in the public sector. However they also suggest the need to consider jointly public and private labour-market institutions, an undertaking which may run into some informational problems. We observe some interesting differences between the aggregate estimates and the sector-wide estimates for three fundamental fields of public intervention, i.e. Education, Health, and Utilities, suggesting that policies aiming to

affect wage determination in the public sector are not likely to be very successful if they follow a one-size-fits-all approach.

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Table A.1 – The Composition of the SES Sample Under Scrutiny (N's), by Sector and Level of Education**France**

	PUBLIC	SECTOR	FEMALES	
	A	B	C	Total
Education	151	464	2672	3287
Health	1376	9117	835	11328
Utilities	169	712	147	1028
Others	281	1276	748	2305
Total	1977	11569	4402	17948

	PUBLIC	SECTOR	MALES	
	A	B	C	Total
Education	123	380	2342	2845
Health	404	2569	411	3384
Utilities	1136	3314	387	4837
Others	492	1989	1155	3636
Total	2155	8252	4295	14702

	LPE	FEMALES		
	A	B	C	Total
Education	0	30	17	47
Health	591	3035	424	4050
Utilities	125	468	142	735
Others	3395	13522	6258	23175
Total	4111	17055	6841	28007

	LPE	MALES		
	A	B	C	Total
Education	3	41	12	56
Health	355	951	214	1520
Utilities	465	1589	341	2395
Others	6543	25768	10997	43308
Total	7366	28349	11564	47279

Germany

	PUBLIC SECTOR		FEMALES	
	A	B	C	Total
Education	2363	4144	14639	21146
Health	1189	10106	2188	13483
Utilities	325	3560	639	4524
Others	1806	14603	5317	21726
Total	5683	32413	22783	60879

	PUBLIC SECTOR		MALES	
	A	B	C	Total
Education	2866	4148	17619	24633
Health	432	4106	2872	7410
Utilities	2939	17869	2019	22827
Others	2327	21430	10111	33868
Total	8564	47553	32621	88738

	LPE		FEMALES	
	A	B	C	Total
Education	411	518	217	1146
Health	1564	11202	1867	14633
Utilities	484	5471	869	6824
Others	9109	48002	9795	66906
Total	11568	65193	12748	89509

	LPE		MALES	
	A	B	C	Total
Education	661	705	164	1530
Health	643	5368	2445	8456
Utilities	2523	20136	2635	25294
Others	19385	130227	39591	189203
Total	23212	156436	44835	224483

Italy

	PUBLIC SECTOR		FEMALES	
	A	B	C	Total
Education	811	4938	4955	10704
Health	1692	4227	2039	7958
Utilities	124	673	203	1000
Others	570	2416	1336	4322
Total	3197	12254	8533	23984

	PUBLIC SECTOR		MALES	
	A	B	C	Total
Education	583	1933	2656	5172
Health	964	1861	1659	4484
Utilities	2153	2359	348	4860
Others	2435	3821	1477	7733
Total	6135	9974	6140	22249

	LPE		FEMALES	
	A	B	C	Total
Education	27	23	23	73
Health	1036	1553	361	2950
Utilities	447	556	125	1128
Others	8062	12567	3664	24293
Total	9572	14699	4173	28444

	LPE		MALES	
	A	B	C	Total
Education	6	19	9	34
Health	228	456	171	855
Utilities	2818	1988	200	5006
Others	21574	25788	6015	53377
Total	24626	28251	6395	59272

Spain

	PUBLIC	SECTOR	FEMALES	
	A	B	C	Total
Education	164	386	1378	1928
Health	962	2359	3131	6452
Utilities	83	223	202	508
Others	901	979	1950	3830
Total	2110	3947	6661	12718

	PUBLIC	SECTOR	MALES	
	A	B	C	Total
Education	67	288	898	1253
Health	642	700	1238	2580
Utilities	837	1037	489	2363
Others	1671	1350	1992	5013
Total	3217	3375	4617	11209

	LPE	FEMALES		Total
	A	B	C	
Education	14	42	219	275
Health	291	368	236	895
Utilities	342	406	196	944
Others	6925	5283	4981	17189
Total	7572	6099	5632	19303

	LPE	MALES		Total
	A	B	C	
Education	13	18	145	176
Health	162	101	80	343
Utilities	1138	958	517	2613
Others	12185	10636	7447	30268
Total	13498	11713	8189	33400

Sweden

	PUBLIC SECTOR			FEMALES	Total
	A	B	C		
Education	563	3564	7793	11920	
Health	1136	10294	17416	28846	
Utilities	59	518	284	861	
Others	433	1933	1807	4173	
Total	2191	16309	27300	45800	

	PUBLIC SECTOR			MALES	Total
	A	B	C		
Education	299	1394	4098	5791	
Health	667	3326	6374	10367	
Utilities	263	1565	548	2376	
Others	805	3931	1646	6382	
Total	2034	10216	12666	24916	

	LPE			FEMALES	Total
	A	B	C		
Education	13	123	292	428	
Health	198	1136	829	2163	
Utilities	104	553	217	874	
Others	1600	9096	5444	16140	
Total	1915	10908	6782	19605	

	LPE			MALES	Total
	A	B	C		
Education	10	73	137	220	
Health	76	332	260	668	
Utilities	498	1927	516	2941	
Others	4343	24028	10008	38379	
Total	4927	26360	10921	42208	

UK

	PUBLIC	SECTOR	FEMALES		Total
	A	B	C		
Education	525	3183	4275		7983
Health	559	3186	2898		6643
Utilities	7	38	36		81
Others	157	781	549		1487
Total	1248	7188	7758		16194

	PUBLIC	SECTOR	MALES		Total
	A	B	C		
Education	365	1855	2218		4438
Health	210	1190	1231		2631
Utilities	56	201	101		358
Others	366	1471	779		2616
Total	997	4717	4329		10043

	LPE	FEMALES		Total
	A	B	C	
Education	17	69	104	190
Health	115	589	368	1072
Utilities	101	521	297	919
Others	1605	7094	4689	13388
Total	1838	8273	5458	15569

	LPE	MALES		Total
	A	B	C	
Education	11	77	67	155
Health	39	214	124	377
Utilities	607	2349	953	3909
Others	3202	14476	8720	26398
Total	3859	17116	9864	30839