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THE PUBLIC SECTOR PAY GAP IN FRANCE, GREAT BRITAIN AND ITALY

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We investigate public–private pay determination using French, British and Italian microdata. While traditional methods focus on parametric methods to estimate the public sector pay gap, in this paper, we use both non-parametric (kernel) and quantile regression methods to analyze the distribution of wages across sectors. We show that the public–private (hourly) wage differential is sensitive to the choice of quantile and that the pattern of premia varies with both gender and skill. In all countries the public sector is found to pay more to low skilled workers with respect to the private sector, whilst the reverse is true for high skilled workers. When comparing results across countries, we find that where pay formation is more regulated (i.e. as in France and Italy) the public sector pay gap is smaller; whilst where market factors play a larger role in pay determination (i.e. as in Great Britain) the public sector pay gap is larger—particularly in the lower part of the wage distribution—and females are much better off in the public sector as compared to the private sector.

1. Introduction

In many OECD countries public sector employment accounts for a significant share of total employment and public sector expenditures, as well as playing an important role in economic performance. The institutional setting governing human resources management and pay determination, as well as the goods and services (respectively) offered, however, can differ significantly between the public and private sectors. In this context, relative pay also shows substantial heterogeneity by gender and skill levels between the two sectors, whilst both sectors compete on the labor market. Among other things, these features have important implications for the functioning of the labor market in terms of workers-job queues, "wait" unemployment, as well as adverse effects in recruitment, retention and incentive policies. Empirical evidence on the public sector pay gap suggests, even after controlling for observable characteristics, a positive wage differential for public sector workers and higher premia for women as compared to men; also, pay

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dispersion is usually found to be lower in the public sector with respect to the private sector. Given existing differences in the distribution of wages across public and private sectors, public sector pay gap estimates proved, in general, rather sensitive to sample choice, empirical specification and the group of worker selected (Gregory and Borland, 1999).

In this paper, we investigate public–private pay determination comparing different institutional settings and public sector pay formation, using French, British and Italian microdata. Our findings contribute to the existing literature in several ways. First, by focussing on different countries we exploit institutional differences to gain insights on the process of pay formation. Second, while traditional methods focus on a parametric approach to estimate the public sector pay gap, we use both non-parametric and quantile regression methods to analyze the distribution of wages across sectors. We show that the public–private (hourly) wage differential is sensitive to the choice of quantile and that the pattern of premia varies with both gender and skill. We argue that the decomposition of predicted wage gaps at diverse quantiles provides a more accurate set of measures for the size of the part of the wage gap that is attributed to different returns to skills between the public and private sector. In all countries the public (private) sector is found to pay more (less) to low skill workers with respect to the private (public) sector, whilst the reverse is true for high skill workers. The effects are more pronounced for females. Finally, when the wage differential is decomposed by quantile, using an Oaxaca–Ransom type decomposition, we show that a significant portion is explained by observed characteristics (over 60 percent on average) and is increasing over the wage distribution. Symmetrically, the unexplained part due to the wage differential between public and private sector decreases and becomes close to zero at the highest quantiles, suggesting that differences in unobserved characteristics are more important at lower quantiles. When comparing results across countries, we find that where pay formation is more regulated (i.e. as in France and Italy) the public sector pay gap is smaller; whilst where market factors play a larger role in pay determination (i.e. as in Great Britain) the public sector pay gap is larger—particularly in the lower part of the wage distribution—and females are much better off in the public sector as compared to the private sector.

The paper is organized as follows. We start by comparing the institutional system and pay setting in each country. Next, in Section 3, we describe the data and present some descriptive statistics. Section 4 discusses the empirical strategy and compares results from the standard OLS approach to quantile regression methods. In Section 5 we investigate further the differences in the public sector pay gap across countries. Conclusions follow.

2. Institutional Differences in Public Sector Pay

The set of rules governing terms and conditions of employment and pay are quite different across the public and private sectors, in all countries. Despite the substantial changes introduced in recent decades to increase both competition and efficiency of the public sector, significant differences still exist between the two sectors. The latter range from the criteria adopted, in each sector, to select, recruit and promote workers, and to adjust wage levels, as well as in terms of wage

profiles, career advancement and the role played by collective bargaining and trade unions. In Italy and France public servants are still generally recruited through open, competitive examinations—for which a given level of education is required—and, once hired, enjoy life-time contracts in which seniority plays a major role. In general, public servants in the above countries cannot be discharged, except for misconduct, and the statutory terms apply regardless of whether the individual is employed at the national, regional or local authority level. Conversely, in Great Britain the process of decentralization has determined greater variation in both recruitment criteria and pay levels of civil servants across different Departments within the public sector and a number of services have been progressively contracted out.

In the French public sector the same pay scales apply to all public sector workers, and while unions do play a role in national wage negotiations the outcome of the bargaining process is not legally binding for the government (Guillotin and Meurs, 1999). In Italy, public sector wage levels and wage adjustments are largely decided at the central level (Dell'Aringa and Della Rocca, 1999).[1] In Great Britain, civil servants are covered by a variety of different arrangements, which include: Review Bodies, index linking, and decentralized as well as centralized collective bargaining. Also contracting-out and competitive tendering have contributed to a progressive "privatization" of pay setting procedures (Bender and Elliott, 1999). Thus, whilst in Great Britain private sector pay is used as a reference point for pay determination in the public service (at least in some part of it), France and Italy lack any application of this comparability principle and the reference is, in general, given by cost of living and public budget conditions.[2]

The total size of the public sector appears fairly similar in France and Great Britain, but smaller in Italy; however when computed as a percentage of total employment, Great Britain exhibits a smaller size—i.e. even more if allowance is made for part-time employment. A rough indication of the extent of public sector decentralization, across countries, is shown in Table 1 (row 1), where we report the share of public sector workers employed in Central administration. For example, in Great Britain the share of employees employed in the Central administration is 10–15 percent lower than in the other countries.[3] The public sector's composition also can vary substantially among countries (Table 1, rows 2 and 3): Italy shows a larger share of public sector employees in education, while the health sector is relatively larger in Great Britain. Another important difference across countries is related to the occupational structure and in particular to the share of managers. Great Britain, in particular, is characterized by a much larger share of managerial occupations (14 percent)—both in the public and private sectors—as opposed

[1]Public sector pay negotiations cover each of the eight functional sub-sectors defined as a result of the 1993 civil service reform in which an independent agency (Agenzia per la reppresentanza sindacale nel pubblico impiego, ARAN) has been invested of negotiating for public sector employees. The police and armed forces, university professors and other academic staff, judges and prosecutors, as well as senior civil servants are excluded from these negotiations.

[2]Minimum wage legislation also has different applications in these countries, being relevant in Great Britain and France, but absent in Italy.

[3]Note that that the Department of Education is not included in central administration in the U.K., but it is in France and Italy, which could partly explain the difference.

TABLE 1

PUBLIC SECTOR EMPLOYMENT STRUCTURE IN 1998

	France	Italy	Great Britain
Decentralisation			
1. Central administration (%)	0.53	0.59	0.43
PA sectors			
2. Education (%)	0.25	0.33	0.24
3. Health (%)	0.18	0.20	0.25
Total employees (1,000's)	4,583	3,330	4,794

Source: France—Ministere de la fonction publique, *Les chiffres cles de la fonction publique*, DGAFP, 2003.

Great Britain—Hicks S, Lindsay C, Livesey D, Barford N, Williams R., "Public Sector Employment", Office for National Statistics, March, 2005-06-22.

Italy—ARAN, *Conto Annuale*, 1998.

to Italy (2 percent) and France (5 percent).[4] The implications of these patterns are important, since both the level of decentralization and the composition of employment by occupation, education, age, hours of work are going to affect pay formation.

In the private sector, as opposed to the public, the degree of regulation is generally much lower in all countries. Italy and France, however, are still characterized by quite strict job protection measures, extensive coverage of collective agreements and a rather centralized system of pay determination. Conversely, in Great Britain pay determination is highly decentralized, unions are weaker and job protection is fairly low (OECD, 2000). As might be expected, pay inequality is greater and low pay employment is larger in Great Britain as compared to both France and Italy (OECD, 1996; Lucifora, 2000).

The different set of institutional rules that govern pay determination in the public sector, in the three countries considered, provides an interesting source of variation for assessing whether wage regulation and pay comparability standards, as well as other factors, have an impact on the public–private pay gap.

2.1. *Public–Private Pay: Some Stylized Facts*

Comparing (gross) pay levels across public and private sectors is not without problems. The more the public sector undertakes activities that are not found in the private sector and the lower is substitutability in the goods and services provided by each sector, the more difficult comparability is and the higher is the scope for pay differences existing across sector. Moreover, since the vast majority of doctors, nurses, teachers, policemen and judges are employed in the public sector, while insurance salesmen, assembly workers, stock and bond dealers are exclusive of private sector, average qualification and job contents are likely to differ and hence comparison of (unconditional) pay levels across sector can prove mislead-

[4]Data on the occupational structure come from the European Labour Force survey (Eurostat), hence observed differences should not depend upon different classification standards.

ing. With these caveats in mind, when we look at the raw average difference in pay between public and private sector, we find that these are quite different—i.e. 11.5, 28.5 and 16.1 percent, respectively for France, Italy and Great Britain. However, if we account for the existing heterogeneity in the characteristics, pay differentials are much lower than suggested from raw data: namely between 5 and 6 percent in all countries. Apart from average differences, one common feature shared by most countries is that minimum rates of pay for least skilled workers are higher in the public sector. This is the result of a number of features that impact differently on either sector. A wider union presence and a more effective use of union power—which protect low paid workers—as well as "fair" rates of pay offered by the State (as "good employer") to the least skilled, all tend to reduce wage dispersion in the lower part of the distribution in the public sector as compared to the private (Bender and Elliott, 1999). Conversely, the rates paid to the most senior public servants have often been reported to be substantially lower than those paid to individuals with comparable skills and responsibility in the private sector: public opposition to high rates of pay for public servants seems to account for this feature (Katz and Kreuger, 1991; Lucifora, 1999). Whilst the combined effects of these features is conducive to a less dispersed public sector wage structure, an additional effect works through the larger proportion of low paid individuals in the private sector of the economy, where both monopsony and discrimination effects have been documented to be larger (Bazen *et al*., 1998). The economic consequences of such an imbalance, assuming the private sector as the reference sector, are that the public sector pays more than the opportunity wage for unskilled and low skilled labor. On the contrary, under the hypothesis that labor market failures are less relevant for skilled individuals in the private sector, the rates paid to high skilled workers in the public sector appear to be less than what would be needed to attract, retain and motivate such workers. Clearly, the underlying distortions in relative pay, in both sides of the distribution, makes human resource management and recruitment decisions particularly difficult.

There are, of course, several features that are missing from a simple wage comparison which might be relevant. For example, other dimensions of the work package and the work environment such as, job security, risk and injury at work, may play a role (Hamermesh and Wolfe, 1990; Sandy and Elliott, 1996). Also, workers might be heterogeneous across sectors with respect to some unmeasured characteristics in a non-random way, such as preference for public sector work, desire to be a civil servant, or work in the non-profit sector, and thus self-select themselves according to those features. In this paper, while acknowledging the caveats that the features discussed above may imply, we restrict attention to the public sector pay gap as measured by hourly wages and focus on pay differentials between the public and the private sector that emerge along the entire wage distribution. The next section briefly reviews the empirical evidence and discusses the main results from previous studies.

2.2. *Previous Studies*

Most studies that have investigated relative wages across public and private sectors used a standard wage equation approach with a dummy variable to iden-

tify the public sector and estimate the public sector pay differential. An alternative approach has been to estimate separate equations for each sector and then compute the implied wage differentials using the Oaxaca–Ransom methodology. Some studies have also attempted to model the choice of the sector jointly with wage determination and then correct the estimation of the public–private differential.[5] In general, results from the above studies show a great deal of variation in the estimated differentials depending on the sample selected, the definition of the public sector, the specification chosen and the identification strategy used. These features, however, considerably complicate comparisons across countries.

The general finding in Great Britain is that, on average, civil servants earn more than comparable workers in the private sector (Rees and Shah, 1995; Disney and Gosling, 1998, 2003; Blackaby *et al*., 1999; Bender and Elliott, 1999). The average differential controlling for standard human capital variables is close to 5 percent, although it is much higher for females (15–18 percent) as compared to men (2–5 percent); while approximately half of the raw differential is explained by differences in observed characteristics. Evidence for Italy also suggests a relatively large raw (positive) differential between the public and the private sector (Cannari *et al*., 1989; Bardasi, 1996; Brunello and Dustmann, 1997; Lucifora, 1999; Comi *et al*., 2002). After conditioning on a set of variables, the differential results are moderate for men (10 percent) and higher for females (18–20 percent). The largest portion of the wage gap, however, can be attributed to differences in the observed characteristics of workers (90 percent), whilst only small differences in returns exist between the sectors. Finally, quite surprisingly, only a few studies have investigated the issue of public sector pay differentials in France (INSEE, 1996; Fournier, 2001; Fougere and Pouget, 2004). These studies suggest that in the public sector there is a positive (negative) premium for low (high) skilled workers, and that being a female also grants a positive premium.

However, given the differences in the distribution and dispersion of pay between the sectors, the standard approach based on the analysis of the conditional mean of the distribution has been criticized in a number of studies. For the U.S., Poterba and Rueben (1994) report evidence suggesting that the wage distribution for the public sector is much less dispersed and propose alternative methods to analyze pay differentials based on quantile regression. Mueller (1998) provides a decomposition of wage differentials at several quantiles of the densities, applied to workers in the public and private sectors in Canada. In the U.K., Blackaby *et al*. (1999) and Disney and Gosling (1998) show that the public sector pay gap varies along the distribution, being higher for the lowest deciles with respect to the top deciles. Melly (2002), in Germany, also finds that the differential decreases monotonically as one moves up the wage distribution.

[5]A number of studies estimated a sectoral choice equation which is then used to correct the coefficients in the wage equations. Notable examples of such an approach are Godderis (1988) and Hartog and Osterbeek (1993). Few studies also use fixed effect estimators to analyze public sector pay differentials; examples are Disney and Gosling (1998, 2003). However, both approaches are not without problems (Manski, 1993, 1995; Nawata, 1996). Some other studies have used longitudinal data and job movers to identify and estimate the public–private pay gap (Disney and Gosling, 2003). While this approach has the clear advantage of allowing researchers to control for unobserved heterogeneity through individual fixed effects, when transitions between sectors are scarce and badly measured (as it is in Italy and France, for example) there might be problems in the precision of the estimates.

TABLE 2

DESCRIPTIVE STATISTICS

	France		Italy		Great Britain	
	Private	Public	Private	Public	Private	Public
Personal characteristics						
Age	38.8	41.4	37.2	42.9	38.2	41.7
Education (years)	13.0	14.1	10.1	12.5	12.0	13.0
Females	0.432	0.601	0.360	0.549	0.452	0.644
Marry	0.750	0.761	0.607	0.767	0.586	0.661
Job attributes						
Workers	0.395	0.113	0.611	0.144	0.505	0.342
Clerks	0.304	0.439	0.315	0.475	0.183	0.169
Intermediate	0.251	0.394	0.054	0.344	0.142	0.393
Managers	0.050	0.054	0.020	0.035	0.170	0.096
Part time	0.162	0.212	0.080	0.055	0.217	0.312
Wages						
Males						
Hours	39.77	38.83	41.64	37.22	39.77	37.76
Log hourly wage (€)	2.123	2.238	2.072	2.357	2.417	2.578
(st dev)	0.381	0.365	0.465	0.422	0.604	0.532
Females						
Hours	34.61	34.59	36.13	32.31	29.59	28.32
Log hourly wage (€)	1.974	2.165	1.918	2.303	2.077	2.355
(st dev)	0.357	0.362	0.490	0.445	0.553	0.514

Note: Education is included in Central Administration in France and Italy.

3. DATA AND DESCRIPTIVE STATISTICS

This study uses microdata for Great Britain, France and Italy, for 1998.[6] Data used are drawn from National Surveys: British data from the Labor Force Survey (GBLS); Italian data from the Bank of Italy's Survey of Household Income and Wealth (SHIW); and French data from Enquéte Emploi (FREE). Each National Survey provides information on standard human capital variables (i.e. education, gender, marital status, age), occupation, region of residence, gross earnings, hours worked, part-time status and a public sector identifier.[7] We restrict our samples to non-agricultural employees aged from 15 to 70. In Table 2, we report the main features of the three data sets used and compare public and private sector workers. Descriptive statistics show that, on average, civil servants are older, more educated and work shorter hours in all countries. In the public sector are found more females, more part timers and a larger share of white collar workers. Furthermore,

[6]While using a single cross-section is never ideal, as the estimated differential could be influenced by some idiosyncratic shock, 1998 does not seem to be an outlier in the evolution of the public sector pay gap. In particular, Comi *et al*. (2002), documenting the evolution of public sector wages, over 15 years in Italy, do not report any specific pattern on the pay gap in 1998. Similarly, Fougère and Pouget (2004) and Desplatz *et al*. (2004) provide evidence for a moderate wage progression in France over the 1990s in both public and private sectors. Finally, Hicks *et al*. (2005) show that in Great Britain, over the second half of the 1990s, while no significant changes in wages in both sectors occurred, the year 1998 coincides with the lowest level of public sector employment as a share over total employment.

[7]The definition retained for the public sector is the same in all countries. It includes Central and Local Administrations, Health and Education and excludes firms, financed by the State, but operating on the market.

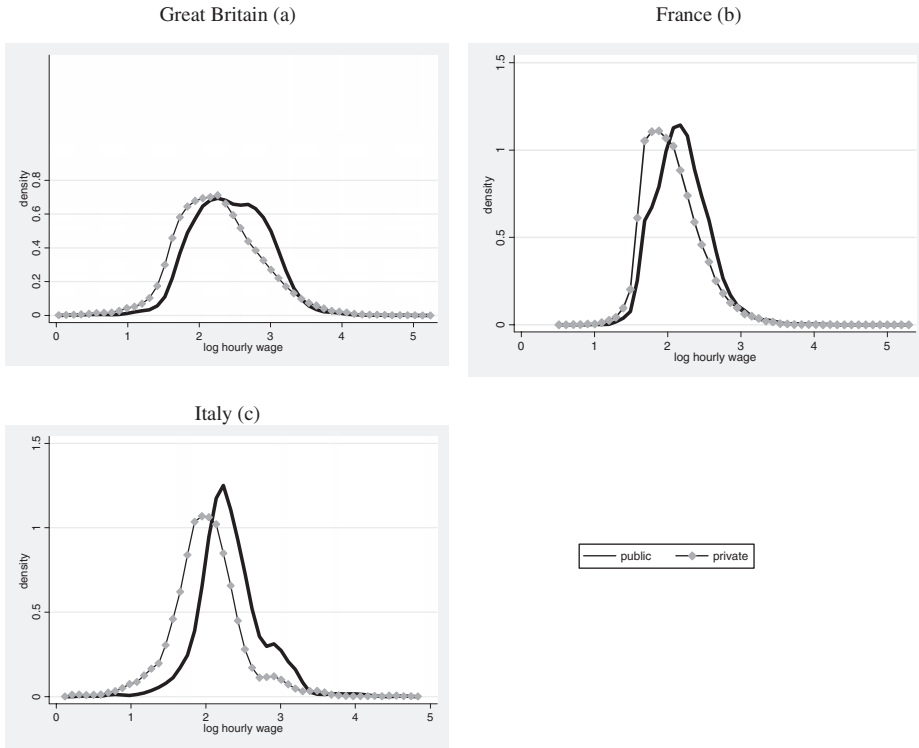

Figure 1. Distribution of Hourly Wages in the Public and Private Sector

when comparing hourly wages, public sector employees—both males and females—are shown to earn higher wages.[8]

Public and private sector wages also differ in term of (both unconditional and conditional) dispersion. In particular, the standard deviation of (log) hourly wages in the public sector (private sector) is 0.533 (0.604), 0.422 (0.465) and 0.365 (0.381) respectively in Great Britain, Italy and France. Wage dispersion appears to be wider in Great Britain, as opposed to Italy and France, especially in the private sector. To inspect the distribution of wages across sectors, we used non-parametric methods (kernel density estimator) to fit the density of hourly wages, which we then plot in Figure 1 for each country. Estimated densities confirm that (hourly) wages in the public sector, in all countries, have both a higher mean and a lower dispersion with respect to the private sector.

4. Public–Private Wage Differentials: A Cross-Country Comparison

We first estimate the public–private sector pay gap, pooling data for all sectors and countries and controlling, respectively, for the public sector and a set of

[8]In 1998 parities for the Euro were fixed within the European Monetary Union (EMU), hence this is what we used for France and Italy. As far as Great Britain is concerned, we used the average exchange rate for 1998 (European Parliament, 1998).

country dummies; next we split the sample by country and estimate a country specific public sector pay gap. When using OLS, we find a positive statistically significant coefficient on the dummy variable for the public sector—ranging from 0.05 to 0.113, according to the specification chosen and the country considered (i.e. Table 3, column 1). The estimated (conditional) pay gap is larger for Great Britain and smaller for Italy (which has the largest unconditional differential). Also, as one might expect, conditioning on a larger set of variables reduces the estimated pay gap. When the sample is split by gender, females show a much larger public sector wage gap as opposed to males.[9] The evidence discussed above, however, suffers from some limitations. In particular, given the differences in the distribution of pay between the sectors (i.e. public sector low-skilled workers, located in the lower part of the distribution, enjoy higher pay as compared to private sector workers), OLS methods based on conditional mean wage may be overly restrictive. In this context, the use of quantile regression methods (QRM), which allow the analysis of the entire wage distribution, may be preferable: for the (marginal) effect of the covariates on the dependent variable can differ at different points of the wage distribution. These outcomes may also be interpreted as the effect of a different distribution of unobserved determinants of wages, for a given set of workers characteristics, at various points of the wage distribution. The analytical framework we adopt for the estimation is based on the quantile regression methodology developed by Koenker and Basset (1978), and applied in the context of wage equations, among others, by Chamberlain (1994), Poterba and Rueben (1994), Buchinsky (1994, 1996, 1997) and Machado and Mata (2000).

Assume that the quantile q-th of the conditional distribution of wages is a linear function of worker's characteristics (X_k):

$$Q^q(y_k/X_k) = X_k\beta_k^q + PUB_k*\delta^q \tag{1}$$

Koenker and Basset (1978) have shown that quantiles can be estimated by minimizing (β^q, δ^q) in (2):

$$\min_{\beta^q,\delta^q} \sum_{\sigma_k<0} q^*|y_k - X_k\beta^q - PUB_k*\delta^q| + \sum_{\sigma_k>0} (1-q)^*|y_k - X_k\beta^q - PUB_k*\delta^q| \tag{2}$$

In the empirical analysis that follows, we first estimate the impact of workers' characteristics and job attributes on public and private sectors wages for males and females, and we then proceed to decompose the wage differential into a component that is due to differences in observed characteristics and a component that is due to differences in the rewards.

4.1. *Main Results*

To examine the effects of differences in characteristics on the public sector pay gap at different points in the distribution, we first carry out a series of quantile regressions on the pooled data set—by country and sector—and compare the main set of results with OLS estimates. Pooled regressions impose the restriction that the returns to observed characteristics are the same across countries and for

[9]The whole set of estimations is contained in an Appendix, not reported here, which can be obtained upon request from the authors.

TABLE 3

ESTIMATES OF PUBLIC SECTOR WAGE GAP (DECILES OF THE WAGE DISTRIBUTION)

		Quantile Regression: Deciles								
	OLS	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
Pooled sample										
Model 1	0.080	0.114	0.121	0.114	0.106	0.094	0.079	0.062	0.039	0.001
(n = 70,971)	(28.52)	(23.80)	(31.28)	(30.47)	(30.82)	(26.36)	(21.87)	(16.23)	(8.54)	(0.15)
Model 2	0.058	0.107	0.091	0.077	0.070	0.064	0.054	0.042	0.024	–0.001
(n = 70,971)	(18.97)	(27.48)	(26.83)	(25.19)	(22.97)	(20.48)	(17.05)	(11.49)	(6.62)	(–0.26)
France										
Model 1	0.070	0.094	0.110	0.106	0.096	0.082	0.069	0.053	0.033	0.003
(n = 49,286)	(20.03)	(19.23)	(26.95)	(22.98)	(25.92)	(20.83)	(16.05)	(12.00)	(6.55)	(0.41)
Model 2	0.055	0.095	0.084	0.072	0.070	0.064	0.054	0.041	0.026	–0.006
(n = 49,286)	(17.67)	(23.02)	(24.04)	(22.49)	(21.24)	(17.93)	(15.58)	(11.16)	(6.08)	(1.00)
Italy										
Model 1	0.113	0.172	0.150	0.130	0.122	0.117	0.109	0.111	0.107	0.059
(n = 4,820)	(8.50)	(7.64)	(8.49)	(9.44)	(9.42)	(9.22)	(7.26)	(7.12)	(6.34)	(2.22)
Model 2	0.049	0.114	0.084	0.069	0.060	0.061	0.053	0.038	0.027	–0.017
(n = 4,820)	(3.67)	(4.46)	(4.95)	(4.30)	(4.60)	(5.34)	(4.17)	(2.51)	(2.45)	(0.83)
Great Britain										
Model 1	0.079	0.154	0.134	0.130	0.114	0.099	0.075	0.052	0.034	–0.025
(n = 16,864)	(9.14)	(13.26)	(12.31)	(13.45)	(11.30)	(10.79)	(7.56)	(4.95)	(2.78)	(1.75)
Model 2	0.064	0.137	0.103	0.089	0.082	0.073	0.061	0.053	0.040	–0.005
(n = 16,864)	(8.07)	(10.55)	(10.54)	(10.47)	(10.37)	(8.61)	(7.33)	(5.84)	(3.48)	(0.37)

Notes: Dependent variable: log of hourly wage. T-values in parentheses. Model 1, personal characteristics: female, marital status, education in years, age, age squared. Model 2, Model 1 plus occupations (managers, intermediate, clerks, workers), part-time jobs and regions (region where capital city is located).

Pooled sample: same specification plus country fixed effects (ref: Italy).

the two sectors, and that public–private differences only depend on a shift factor (i.e. as shown in equation (1)). Hence, the estimated public sector dummy captures the extent to which the public sector pay gap remains unexplained—at the various quantiles—after controlling for individual characteristics, education, gender, job attributes and country specific effects. Next, after testing the country poolability, we run separate regressions by country. Table 3 presents estimates of the public–private sector wage differential at every decile of the wage distribution, for the pooled sample and for the country disaggregation, using two different specifications: the first controls for standard human capital variables only, while the second also controls for job characteristics and geographical location (i.e. capital city).[10]

The main set of results from quantile regressions shows that the public sector pay gap declines along the wage distribution; this is a common finding of both the pooled regression and country regressions.[11] The estimated public sector pay gap from the pooled model varies from 10 to 12 percent (lower when more controls are included in the specification), in the lowest deciles of the distribution, to almost zero in the highest deciles.[12] A similar pattern is found for the separate country regressions, where the wage premia paid to workers located in the lower part of the wage distribution is significantly higher, as compared to that paid at the top of the distribution. Interestingly, conditioning on a larger set of controls (model 2, in Table 3), the largest pay gap (at the lowest deciles) is found in Great Britain, while estimates for France and Italy do not differ considerably between them. These findings confirm our previous claim that focussing on the average public sector gap might be not appropriate. Since much of the empirical evidence we reviewed suggests the existence of a different gap across genders, in Figure 2 we report coefficient estimates of the public sector dummy (by decile) in separate country wage regressions for males and females. The public sector gap is decreasing along the wage distribution in all countries, and it is much higher for female workers as compared to their male counterpart (as shown in Figure 2). In the case of females the gap remains positive even at the top deciles, while for males in the upper part of the distribution it turns negative. It is worth noting that in Great Britain, the difference in the public sector wage gap across gender is far higher at the lowest deciles and decreases moving up the distribution; conversely in Italy and

[10]A number of sensitivity tests have been performed to check robustness of estimates. In particular, we focussed attention on school teachers. The main differences across countries concerns the higher number of hours worked declared by British (38.9), Italian (27.7) and French (34.1) teachers. When we exclude the teachers from the sample used in the empirical analysis, we find that the public–private pay differential is only slightly smaller in two of the three countries (no difference in Italy).

[11]We tested the poolability of countries' data sets—testing the restriction on equality of coefficients—first on public sector dummies and then on the overall equality of coefficients, and rejected both at the 1 percent significance level.

[12]The other variables included (though not reported in the table) are in line with the standard findings in the literature: for example, returns to education and age increase over the deciles in all countries. The only exception is Italy where returns to age decrease monotonically over the distribution. We also experimented with non-linear (quadratic) terms in education, as well as splines (with a knot at the end of compulsory schooling) and tested the differences in coefficient estimates. We found that the assumption of linearity could be rejected only for France, while in Italy and Great Britain the hypothesis was consistent with the data. In general results of the estimation were largely unaffected by these changes in specification.

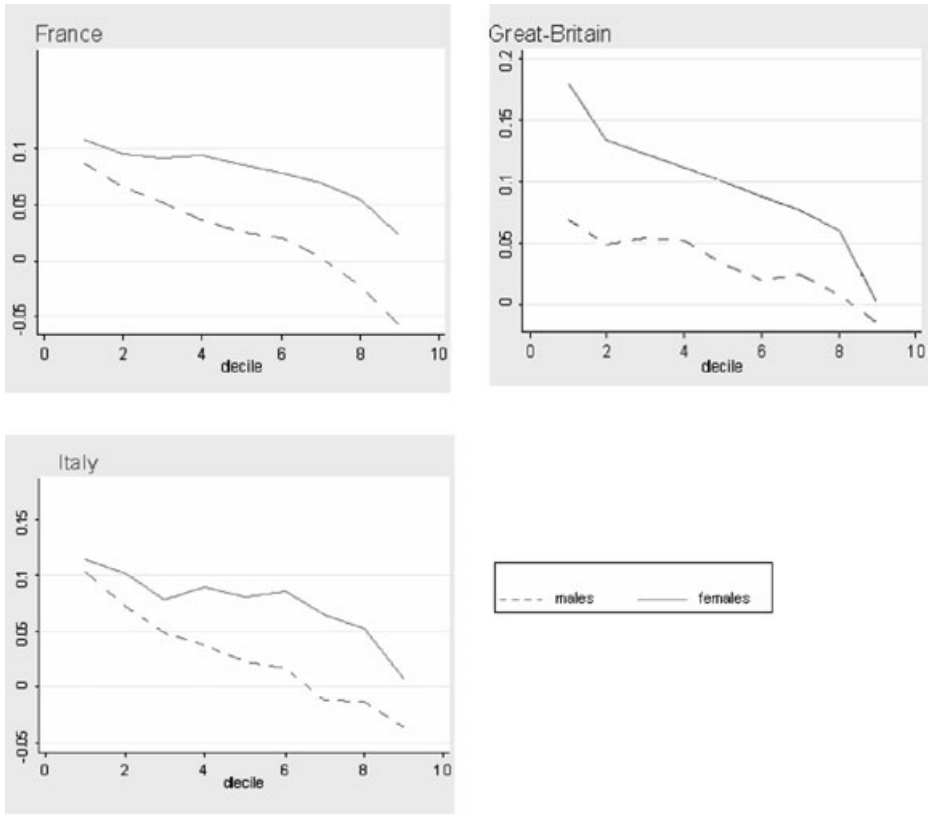

Figure 2. Estimates of Public Sector Wage Gap (deciles of the wage distribution)

France differences in the gap, across genders, increase along the distribution and are higher at the top deciles. In terms of gender wage differences, these patterns suggest that female are relatively (much) better off being in the public sector—with respect to men—at the lowest deciles in Great Britain, whilst the opposite is true (i.e. they are relatively better off at the highest deciles) in France and Italy. A possible interpretation for these patterns should take into account the differences in wage formation across countries. In particular, the more regulated environment for wage setting which is found, particularly in the private sector, in France and Italy has the effect of reducing the magnitude of wage differentials. Conversely, the more market-oriented environment in wage formation which prevails in Great Britain, in the private sector, tends to exacerbate wage differentials.

The above results tend to assign all differences in wages to a shift factor, neglecting the possibility that there might be differences in productivity related characteristics by sectors. To account for this, we estimate a more flexible specification by fitting separate earnings equations for public and private sectors and, within each sector, by gender. Results from this exercise confirm the findings that parameter estimates are not stable along the wage distribution. However, while returns to characteristics tend to decline over the wage distribution in Italy and

France, in Great Britain the opposite pattern is observed. This provides further support to the hypothesis that institutional differences in wage regulation matter: that is, in Italy and France, collective bargaining and union presence impose lower returns to productive characteristics and favor a more egalitarian wage structure; whilst, in Great Britain, decentralization in wage setting and higher employer discretion in wage setting (i.e. to attract and motivate workers, as well as using monopsony power) increase pay dispersion as well as public–private wage differences. In the next section, we address directly the issue of what part of the public sector wage gap is explained by differences in observed characteristics and what part is due to differences in rewards.

5. Decomposing the Gap

The standard methodology for analyzing public–private sector wage differentials, with OLS, is to decompose the observed gap into two main components and an interaction effect treated as a residual. In practice, the first part reflects the difference in average worker characteristics and job attributes between sectors; while the second part captures the difference in the returns to worker characteristics and job attributes between sectors—i.e. all computed at the mean of the wage distribution (Blinder, 1973; Oaxaca, 1973; Oaxaca and Ransom, 1994).[13] The evidence presented in previous sections, however, suggests that the public–private wage gap may be higher in the lower part of the wage distribution. To explore further this hypothesis we decompose wage differences, quantile by quantile, using an Oaxaca–Ransom type decomposition.[14] One main difference between OLS and QRM is that, whilst OLS estimators ensure that the "predicted wage" evaluated at the sample average vector of characteristics is equal to the sample average wage, QRM estimators do not share the same property. We follow a simple version of the approach developed by Machado and Mata (2000) which is based on quantile regression techniques and extend it to account for the "index" problem as suggested in Neumark (1988) and Oaxaca and Ransom (1988, 1994). The procedure is to generate counterfactual densities at each quantile of the distribution. In practice, as described in equation (3), we compare public and private workers' characteristics (personal and job attributes) evaluated at the remuneration ($\beta^*(q)$) that an individual at random would get in the whole economy (first part of equation (3)); and the density that would be observed if private and public sector workers, respectively, maintained their own individual and job characteristics but were going to be paid like an individual chosen at random in the economy (second part of equation (3), in square brackets).[15] In so doing, however, the difference between two quantiles of the marginal wage densities between the public and the private

[13]In the literature the wage differential due to different returns is often referred to as the "unexplained" part, and given a residual interpretation (i.e. with respect to what is explained by different characteristics); however, it is not clear if the decomposition will over or under estimate the residual. This should depend on whether omitted variables are positively or negatively correlated with productivity and on the distribution of the omitted variables across both sectors.

[14]Different techniques have been proposed in the literature for analyzing differences in distributions; examples are: Di Nardo *et al*. (1996), Donald *et al*. (2000), Fortin and Lemieux (1998), and Machado and Mata (2000).

[15]A similar approach has also been used by Mueller (1998) and Albrecht *et al*. (2003).

sector weighted by the characteristics of workers does contain an additional component, which we consider of second order of magnitude and treat as a residual.

$$y^{PB}(q) - y^{PR}(q) = (X^{PB} - X^{PR})\beta^*(q) + [X^{PB}(\beta^{PB}(q) - \beta^*(q)) + X^{PR}(\beta^*(q) - \beta^{PR}(q))] \tag{3}$$

In Table 4 we report the results of the decomposition and compare both standard methods and QRM type methods.

Results of the decomposition analysis clearly show that, in all countries and for both genders, the portion of the public sector wage gap accounted by differences in returns to (observed) characteristics declines monotonically, to almost zero, from lower to upper deciles. In other words, a significant portion of the differential, in the lower part of the wage distribution, can be accounted for by differences in returns; while in the upper part there are almost no differences (i.e. in some cases the difference in returns is negative). For males the estimated wage gap due to differences in returns becomes negative at top deciles, implying that there are significant differences in individual (observed) characteristics and occupations across sectors. For females, differences in returns are particularly important at the bottom of the wage distribution while they become insignificant (though still positive) at the top deciles.

Moreover, when comparing the public sector wage gap by deciles between gender, substantial differences emerge across the countries considered. Italy, for example, shows the highest public sector raw differential at each quantile for both males and females, but differences in the estimated wage gap due to returns are much smaller if compared to the other countries. Great Britain exhibits a significantly higher estimated difference in returns for females at lower deciles, while France is in between. In general males have a much smaller public sector wage gap, particularly in the upper part of the distribution. Hence, accounting for differences in the distribution of characteristics between sectors, some interesting patterns stand out. First, women seems to be better off in the public sector, particularly at the lowest deciles. Second, Great Britain seems to be characterized by the largest public–private differences in returns to observed attributes, thus suggesting the existence of higher differences in pay discretion (to retain and motivate) between sectors. Finally, in France and Italy much of the difference in pay between sectors seems to be explained by differences in observed characteristics, rather than in returns, supporting the idea (with the usual caveats) that in more regulated systems general skills and work experience are what matter more in pay determination.

6. Concluding Remarks

In this paper we have investigated public–private pay determination—using French, British and Italian micro data. Using quantile regression methods, we show that the public–private (hourly) wage differential is sensitive to the choice of quantile—thus rejecting the hypothesis of a constant wage differential (as implied in OLS methods)—and that the pattern of premia varies with both gender and skill. In France, Great Britain and Italy low skilled public sector workers are paid higher wages with respect to their private sector counterparts, whilst the reverse is

TABLE 4

DECOMPOSITION OF THE PUBLIC SECTOR WAGE GAP (DECILES OF THE WAGE DISTRIBUTION)

France	OLS	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
Males										
Raw differential (log)	0.116	0.148	0.141	0.132	0.126	0.124	0.120	0.115	0.099	0.072
Differences in return	0.016	0.086	0.063	0.045	0.032	0.024	0.015	0.005	–0.017	–0.055
Females										
Raw differential (log)	0.191	0.183	0.188	0.198	0.206	0.205	0.204	0.196	0.183	0.168
Differences in return	0.072	0.107	0.093	0.093	0.093	0.084	0.078	0.069	0.054	0.034
Italy	OLS	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
Males										
Raw differential (log)	0.285	0.346	0.283	0.261	0.261	0.265	0.267	0.265	0.280	0.281
Differences in return	0.009	0.081	0.050	0.034	0.033	0.021	0.017	–0.002	–0.005	–0.019
Females										
Raw differential (log)	0.385	0.480	0.413	0.380	0.378	0.377	0.394	0.396	0.398	0.363
Differences in return	0.042	0.080	0.066	0.047	0.054	0.052	0.046	0.040	0.038	0.013
Great Britain	OLS	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
Males										
Raw differential (log)	0.161	0.190	0.178	0.182	0.189	0.169	0.174	0.153	0.147	0.110
Differences in return	0.023	0.058	0.046	0.046	0.051	0.034	0.042	0.020	0.006	–0.033
Females										
Raw differential (log)	0.278	0.338	0.304	0.297	0.286	0.285	0.272	0.272	0.259	0.203
Differences in return	0.083	0.163	0.120	0.105	0.089	0.083	0.070	0.067	0.056	0.002

true for high skilled workers. Wage gap estimates suggest that females are better off being in the public sector, particularly at the lowest deciles, whilst the opposite is true for men at the highest deciles. In general, institutional differences in wage regulation seem to play an important role: in Italy and France, collective bargaining and union presence impose lower returns to productive characteristics and favor a more egalitarian wage structure based on observable characteristics—which explain the largest part of the pay gap; conversely, in Great Britain, decentralization in wage setting and higher employer discretion in wage setting contribute to increase pay dispersion as well as public–private wage differences. Different economic implications are in order. On the one hand, empirical evidence confirms that the public sector is a "fair employer," reducing both pay differences by gender and compressing pay dispersion with respect to the private sector. On the other hand, the existence of a positive public–private pay differential, along most of the wage distribution, also means that the public sector pays more than the opportunity wage to low skilled labor, while less than what is needed to attract, retain and motivate high skilled workers.

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