The public-private duality in wage reforms & adjustment during the Greek crisis

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Abstract

There is a general perception that the crisis in Greece impacted mostly public sector wages, whereas in fact its impact on private sector wages has been equally large, if not larger. In this paper we examine sector-specific wage reforms and dynamics for the duration of the crisis, using micro-data from the Greek Labour Force Survey over 2009-2013 and applying a wage-decomposition analysis on the basis of an endogenous switching regression model, which controls for sector-selection. We find large sectoral differences in wage adjustment not only in terms of magnitude but also in terms of timing and direction. While the private sector has recorded a substantial response to the heavy demand pressure, changing noticeably its valuation of worker and job characteristics, adjustment in the public sector, despite the significant wage-cuts, has been slower and less sizeable. Consequently, public premia for monthly regular wages never fell during the crisis; rather, they initially increased and subsequently returned back to their original level.

Keywords

endogenous switching; wage decomposition; public wage premium; crisis; Greece

JEL Codes:

J31, J45, J58, H12

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1.   Introduction

The debt crisis that engulfed Greece since the end of 2009 led to an unprecedented adjustment program, involving an array of policy measures and reforms that particularly affected the labour market. At its outset, the adjustment program focused on fiscal consolidation, thus introducing (among other measures, such as tax hikes) gradual but cumulatively pervasive public sector wage and benefit cuts. Soon policy focus shifted to issues of competitiveness and the current-account deficit, and a number of measures were introduced that targeted specifically the private sector. These included the downgrading/abolition of collective wage agreements, a strong reduction in the statutory minimum wage (the determination of which passed from the social partners to the government) and the liberalisation (albeit slow and to date incomplete) of a number of professions.

On the aggregate, the combined impact of the policy measures and of the general demand shock was an increase in total unemployment from 8% in 2008 to 27% today and an average fall in unit labour costs of approximately 14% over 2009-2013 (OECD, 2013). Given, however, the different position of the two sectors and the different types of measures applied to each, the impact across sectors has been rather differentiated (e.g., Tzannatos and Monogios, 2013, report falls in public sector wages of between 22% and 40%, depending on method of calculation). Despite this, and although there is a rich literature that examines the distributional impact of the 'great recession' on different segments of the labour market in other European countries (Immervoll et al., 2011; Vaughan-Whitehead, 2011; Bentolila et al., 2012; Barret and Kelly, 2012; Bergin et al., 2012; Jenkins et al., 2013; Callan et al., 2013), studies on Greece have been scarce (e.g. Matsaganis, 2012; Matsaganis and Leventi, 2013; Daouli et al., 2013a). Further, none of the existing studies examines the impact of the Greek crisis in light of the striking public-private sector duality. This may be partly because the effects of the Greek crisis, which started later than in other countries (in the mid 2009) and has proven to be the lengthiest in Europe, have yet to materialize in full. Still, it constitutes a significant gap – for understanding, in particular, how the crisis has reshaped the structural characteristics of the Greek labour market.

Pre-crisis inequality in labour market outcomes across the public and private sectors is well-documented. Because the vast majority of public sector jobs were until very recently permanent and unemployment flowed almost exclusively from the private sector, the bulk of the research naturally focused on wage disparities. Studies have estimated the public wage premium to range at 20-40% from the mid-70s to the late 80s (Kioulafas et al., 1991; Kanellopoulos, 1997) and to exceed 50% in the late 1990s (Papapetrou, 2006a; 2006b). More recently, Christopoulou and Monastiriotis (2013) reported an estimate for 2005 of around 32%. Taking as public employees those who work in the public administration, education, and health sectors, Giordano et al. (2011) and Christofides and Michael (2013) reported similar pre-crisis premia. The size of these estimates is particularly high not only in absolute terms, but also relative to differentials observed in advanced economies internationally (Giordano et al. 2011; Campos and Centeno, 2012). Of course, some part of the premium is justified because the skills and characteristics of public sector employees differ from those of private sector employees. Christopoulou and Monastiriotis (2013) report that the pre-crisis public wage premium adjusted for individual characteristics was at the order of 11%, reflecting smaller but still sizeable differences in the valuation of characteristics (structure of returns) between sectors.

In this paper we ask how the aforementioned patterns changed during the crisis. Specifically, we study changes in Greek wages from 2009, a year that marked the beginning of the crisis but saw no wage cuts or labour market reforms, until 2013, a year that follows the implementation of the bulk of labour market reforms and is expected to flag the end of the recession. We document differences in wage dynamics across the public and private sector both at the observational level and adjusting for individual and job characteristics. To explore the driving forces of these differences, we perform endogenous switching wage regressions which control for sector selection; we compare changes in the estimated returns to characteristics across sectors; and we inform our discussion by decomposing the wage changes to their detailed constituent components (price, composition, and selection effects).

We find that, compared to private sector wages (i.e. net monthly wages excluding non-regular bonuses), public wages were less impacted during the crisis. Wage adjustment in the private sector has been stronger, more prolonged, and was accompanied by a substantial change in the structure of returns both for individual characteristics (e.g., education) and on the aggregate (for worker and job characteristics at large). In contrast, wage changes in the public sector took longer to take effect, with a very modest downward adjustment in the early phase of the crisis and equally modest changes in the valuation of worker and job characteristics throughout. Both sectors registered substantially negative horizontal price effects (associated to the regression constant and measuring effectively the size of the shock in each sector). In the private sector a large part of this was offset by favourable changes in the valuation of workforce and job characteristics; while in the public sector adjustment was much smaller and concerned effectively only compositional changes (endowment effects), as changes in the price effects for workforce and job characteristics cancelled each other out.

In what follows, we briefly outline the context of wage-setting in the Greek labour market and the recent pay-cuts and reforms (section 2); we introduce our method, data, and some descriptive evidence (section 3); we present our econometric results (section 4); and conclude by discussing their implications (section 5).

2. A tale of two reforms: Wage setting before the crisis and austerity-led measures in the public and private sector

Labour unions in Greece operate in three levels (primary, secondary, peak), which often have no systematic inter-links, and are highly fragmented along party-political lines. In this context, individual low-level unions and political/governmental forces developed clientalistic relationships, which operate in parallel with the relationships at the peak level (Lavdas, 2005; Tsarouhas, 2008; Zambarloukou, 2006). Governments have used these relationships to pursue consensus on their political agenda while unions pursued particularistic privileges, including pay-raises. Such union-state clientalistic transactions found a more prosperous ground in the public sector, as this sector is less exposed to market competition and unions there have the ability to halt vital operations of the state (e.g. education, health, garbage disposal).

Thus, before the crisis, wage determination in Greece was characterised by a combination of centralised bargaining and various forms of sectoral and occupational fragmentation. In the private sector, bargaining for minimum wages (for basic unskilled occupations) took place at the national level, while other salary categories were bargained separately by sectoral or occupational unions. However, union representation was limited to large private firms (with over 20 employees), while for workers in smaller private firms, which in fact constitute the vast majority, pay was either at the

minimum level or at the level set by centralized agreements by extension of coverage (Tsarouhas, 2008; Zambarloukou, 2006). In the public sector, pay differed among job contracts covered by private or public employment law. The former category was governed by the same rules as the private sector (and the majority had union representation) [1], while the latter was represented by the Chief Directorate of Public Employee Associations (ADEDY) but only at non-wage negotiations; the government unilaterally set the pay-scales for these jobs by law.[2]

Together, informal and formal pay negotiations had caused Greek wages to become rather disparate, even within the public sector. According to a descriptive study commissioned by the government in 2010 (GMIA et al., 2011) public pay varied across several dimensions. First, as we mentioned above, pay differed among jobs covered by private and public employment law. Second, for jobs covered by public employment law, there was a distinction between general and special pay scales, which corresponded to a loose distinction between public employees and civil servants (magistrates, medical doctors, forensic surgeons, academics, diplomats, and the armed forces). Third, pay also varied significantly inside the general and special pay scales, sometimes due to differences in basic pay, but mostly due to different types of bonuses. In result, employees with identical skills and job content often earned very different wages because they were employed in different segments of the public sector. While GMIA et al. (2011) make no connection of labor unions and wage disparity, it is suggestive that within a single Ministry or public entity there may operate several union federations but no federation represents employees across different Ministries or public entities.

The practice of granting privileges to particular interest-groups in exchange for electoral support ended abruptly with the beginning of the Greek crisis. Under pressure to reduce its public expenditure, in 2010 the Greek state unilaterally adopted an array of measures that have impinged on all areas of policy, including in the labour market (see the meticulous reviews by Tzannatos and Monogios, 2013; Ioannou, 2013). With a series of laws voted in that year, the government introduced numerous public pay cuts[3] which had an average effect of about 12% (NBG, 2010). As the crisis escalated in fall 2011, and amid a massive strike wave, the parliament passed another law to further rationalize the pay-scales.[4] This second wave of cuts was meant to address the wage disparity within the public sector discussed above. For jobs in the narrow public sector paid according to the general pay-scales, the 2011 law evened out the basic pay and its evolution with seniority. Although the basic pay was now set somewhat higher relative to prior levels, most benefits were abolished resulting in an overall reduction in total earnings. These new wage arrangements also became the model for private law contracts in public sector utilities and organizations, which were removed from the jurisdiction of collective bargaining. However, they did not apply for civil servants paid under special pay-scales, or for public law contracts in utilities and entities. These job categories were the object of the third wave of reforms that took place in 2012[5]. In that year, the government extended the implementation of the unified remuneration system to public sector utilities, and rationalized the wages of civil-servants based on equivalent criteria, though sustaining the distinction of unified and special pay-scales and an associated premium.

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[1] In 2004 job contracts under private employment law in the narrow public sector that had no union representation were awarded salary equivalent to the jobs covered by public employment law. Laws: N.3205/2003 (ΦΕΚ Α' 297), ΚΥΑ 2/7093/0022 (ΦΕΚ Β' 215/2004), ΚΥΑ 2/5916/0022 (ΦΕΚ Β' 214/2004).

[2] ADEDY comprises over a thousand primary-level unions organized in 45 federations that represent jobs in the narrow public sector; i.e., in central government (Ministries), local government, and public entities. (http://www.adedy.gr/adedy/site/home/ws/primary+menu/adedy/domi/omospondies.csp, accessed: 24/10/13). In effect, these unions exerted pressure on wages via strikes and their ties with political parties.

[3] Laws: N.3833/2010 (ΦΕΚ Α' 40), N.3845/2010 (ΦΕΚ Α' 65), N.3899/2010 (ΦΕΚ Α' 212).

[4] Law N.4024/2011 (Φ ΕΚ Α' 226).

[5] Law: N.4093/2012 (ΦΕΚ Α' 222).

On the employment front, state interventions in the public sector were less dramatic. During 2009-2012, public employment decreased only through retirement and the non-renewal of temporary contracts (approximately 70-80 thousand were lost). Although the permanency of public jobs is protected by the Greek Constitution, the government has committed to a cutback of least a 150 thousand jobs by 2015. As we mentioned earlier, the implementation of this commitment has been deliberately protracted till the late 2013.

Starting with the 2011 law, the government also reformed wages and industrial relations in the private sector. The law implemented a radical decentralisation of wage bargaining by annulling the 'principle of the most favourable provision', according to which enterprise-level bargaining could only deviate upwards from the national agreement (and was thus associated with wage premia – Daouli et al., 2013b). Also radical was the reduction in the monthly minimum wage that followed in 2012[6]. For those above the age of 24, the reduction was from 751 to 586 euros (a reduction of 22%) and for those under the age of 25 the reduction was from 751 to 510 euros (32%). Although these wage reforms took place mostly at the second half of the crisis, job-creation in the private sector started declining dramatically soon after the crisis emerged and employment losses became widespread as the crisis unfolded. As a result, total unemployment in Greece reached an unprecedented 27% by 2013, with most of it flowing out of private employment. The unemployment rate for young people in particular soared at 59%.

Quite naturally, these developments have altered fundamentally the pay and valuation conditions in the Greek labour market, not only in absolute terms (i.e., declining wages) but also in relative terms (relative valuation of characteristics and sorting within and across sectors). Our analysis aims to unveil these processes.

3. Empirical strategy

3.1. Method

We start by describing public sector wage premia both at the observational level and from Mincer wage regressions which control for worker and job characteristics. We report these raw and net premia at the mean and by decile of the wage distribution. We then account for the possible endogeneity between wages and the choice of sector by estimating an endogenous switching regression model, as developed by Van der Gaag and Vijverberg (1988). This model comprises two Mincer wage equations (one for each sector) and a selection equation sorting individuals across sectors, with jointly dependent errors[7]:

$$\ln W_{it} = \beta X_{it} + \varepsilon_{it} \qquad (1)$$

$$S_{it} = \gamma_1 (\ln W_{it,publ} - \ln W_{it,priv}) + \gamma_2 Z_{it} + u_{it} \qquad (2)$$

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[6] This was included in the same law (N.4093/2012) which rationalized wages of the civil-servants.
[7] This is essentially a two-stage procedure, analogous to the Heckman model. Our estimation is by a Full Information Maximum Likelihood (FIML) method, which fits the binary and continuous regressions simultaneously and makes the appropriate error adjustments. For details see Lokshin and Sajaia (2004).

In (1), W_{it} is the monthly wage of individual *i* who is interviewed in year *t*, *X* is a vector of control variables, *β* the respective returns, and *ε* is a random error. In (2), *S=1* if person *i* is in the public sector, $(\ln W_{i,publ} - \ln W_{i,priv})$ denotes the public-private sector wage differential, *Z* is a vector of instruments that influence the choice of sector, and *u* is the error term. We report estimates of the above model separately for different calendar years.

With the derived estimates, we subject the mean wage change from year t_0 to year t_1 to the classic Blinder-Oaxaca (1973) decomposition technique, which separates endowment and price effects, as follows:

$$\ln\overline{W}_{it_1} - \ln\overline{W}_{it_0} = (\overline{X}_{it_1} - \overline{X}_{it_0})\beta_{t_1} + (\beta_{t_1} - \beta_{t_0})\overline{X}_{it_0}$$

(3)

The first term in the right-hand side of (3) captures differences in worker characteristics valuated at t_1 prices (i.e. it gives the endowment effect that would prevail if there were no differences in the structure of returns between the two calendar years, so that $\beta_{t_1} = \beta_{t_0}$), and the second term captures differences in the price of these characteristics expressed in t_0 mean values.[8] To obtain a detailed narrative of wage dynamics, we conduct the above decomposition for alternative time periods (2009-2013; 2009-2011; and 2011-2013) and by separating the characteristics of workers (education, experience, marital status, whether has child/ren, foreign-born) from those of employers/jobs (sector, occupation, region, part-time contract, temporary contract, small firm, hours of work). Specifically, we identify the part of wage-changes that is due to (i) compositional changes in worker characteristics; (ii) compositional changes in job characteristics; (iii) changes in the returns to worker characteristics; (iv) changes in the returns to job characteristics; and (v) changes in the constant (which we interpret to reflect wage changes due to horizontal shifts in 'baseline' wages). Further, we compute a separate 'selection' effect which gives the part of the overall wage change that is accounted for by the way in which different employees, owing to their observed characteristics and unobserved preferences (as captured in our selection equation), select into different sectors.

Finally, we calculate the equivalent detailed decomposition at different deciles of the wage distribution, though we exclude the selection effect since econometric techniques for validly accounting for sample selection in the context of quantile regression are at early stages of development (e.g. Arellano and Bonhomme 2010; Huber and Melly 2011). To do this, we combine the recentered influence function (RIF) approach proposed by Firpo et al. (2009) with the use of weights proposed by DiNardo et al. (1996) and Barsky et al. (2002). Our RIF is a transformation of the log wage so that its mean equals the quantile of interest. Using this function and assuming a linear relationship with the worker and job characteristics, we can generalize the Oaxaca decomposition of the mean gap to quantiles. However this linearity assumption is restrictive and potentially involves out-of-sample predictions. To address this limitation we employ the DiNardo et al. (1996) weighting approach which equalizes the empirical distributions of characteristics between the years compared.

Specifically, our decomposition at the *j*-quantile (q_{tj}) of log wages relies on the following regression:

$$\text{RIF}(\ln W_{it}, q_{tj}) = \beta(q_{tj})X_{it} + v_{it},$$

(4)

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[8] We also applied the Daymont-Andrisani (1984) decomposition to allow for a price-endowments interaction term. The estimated interaction effects were too small to be of economic interest and all other effects remained robust. These results are available upon request.

where $RIF(lnW_{it}, q_{tj}) = q_{tj} + [j - d_j]/f_{lnW}(q_{tj})$, $f_{lnW}(q_{tj})$ is the density function of lnW_{it} computed at quantile q_{tj}, and d_j is a dummy variable that equals one if $lnW_{it} \leq q_{tj}$ and zero otherwise. For $t = t_0$ we estimate (4) as a linear (OLS) regression, but for $t = t_1$ we estimate a weighted least squares (WLS) specification, with the weights given by:

$$w(X) = [\Pr(t = t_0 \mid X)\Pr(t = t_1)]/[\Pr(t = t_1 \mid X)\Pr(t = t_0)], \tag{5}$$

In (5), $Pr(t=t_1|X)$ is the conditional probability of an individual being interviewed in t_1, which we derive by assuming a logit model. It then becomes straightforward to decompose the wage difference by decile into the Oaxaca-equivalent composition and price effects, as follows:

$$q_{t_1 j} - q_{t_0 j} = [(\beta^{OLS}(q_{t_1 j})\overline{X}_{it_1} - \beta^{WLS}(q_{t_1 j})\overline{X}_{it_0}] + [(\beta^{WLS}(q_{t_1 j}) - \beta^{OLS}(q_{t_0 j}))\overline{X}_{it_0}] \tag{6}$$

3.2. Data and descriptive patterns

In our empirical analysis we use individual-level data from the spring wave of the Greek Labour Force Survey (LFS), for the years 2009-2013. The LFS is a quarterly household survey covering information on a range of personal, household and labour market characteristics, including age, gender, marital status, education, region of residence, labour market status, occupation and sector of work, usual hours of work, regular monthly wages (reported in wage bundles which typically have a 100 euro range)[9], and others. Each wave contains approximately 30,000 working-age individuals, of which around two-fifths are wage earners – though this share drops as the crisis deepens.

Table 1 provides summary statistics for our sample, which manifest the significant differences between the public and private sectors both statically, in terms of composition, and with regard to their adjustment during the crisis. Relative to the private sector, the public sector consistently employees more women and more workers who are educated, experienced, natives, and married with children; and has lower rates of irregular (especially part-time) employment. During the crisis the share of the private sector in total employment decreased by 2.2 percentage points. Average years of schooling increased in both sectors, but average experience increased only in the private sector, reflecting the increasing job-finding difficulties for new labour market entrants and the soaring retirement ages. Part-time employment also increased substantially in this sector (but declined in the public sector); while the share of foreign-born declined. Average wages have declined in both sectors but have remained higher in the public sector throughout the period. In real terms (Figure 1A), private wages declined almost linearly from the beginning of the crisis, while public wages fell only faintly over 2009-2011, sharply over 2011-2012, and slightly further in 2013.[10]

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[9]Because the bundles differ slightly across waves, we have harmonised them into eight comparable categories. Following Livanos and Pouliakas (2012) and Christopoulou and Monastiriotis (2013) we take the mean value of the bundles as a proxy for each individual's monthly wage. Although clearly imperfect, this is the only possible way to analyse wages in Greece and it has been shown elsewhere (Christopoulou and Monastiriotis, 2013) to produce robust estimates of Mincer equations when using alternative methods of estimation (OLS and interval regressions).

[10] The rise of public nominal monthly wages in 2009-2011 may seem at odds with estimates of a significant cut in average wages during the period (e.g., NBG, 2010, estimated this at near 12%). Part of this disparity can be explained by measurement, as our wage measure excludes the so-called Christmas, Easter and holiday bonuses (which were accounted for in the NBG estimation). Another part is due to compositional changes of the public workforce: for example, a disproportionate outflow of temporary contract workers (which typically have lower wages) will tend to increase measured average wages despite the pay-cuts. We demonstrate this in Table A1 in the Appendix, which compares our estimates with data from external sources and shows that in all cases (including our data) the wage bill falls monotonically throughout the crisis, even when our mean wage

In other words, public wages declined with a significant delay – at least when having in mind the immense pressures applied to public finances during the period. Average hours of work were in contrast higher in the private sector but have been constantly declining (with around 1.8 hours of weekly work lost between 2009 and 2013), while in the public sector average weekly hours actually increased.

Drawing on the evolution of average monthly wages, we compute the overall (raw) public-private sector wage differential. As we show in Figure 1B, this differential (calculated for 2009 at 32.7%) rose between 2009 and 2011, declined notably in 2012, but recovered significantly – and rather surprisingly – in 2013 (reaching 33.8% in that year).[11] Though not shown here, the equivalent differential in terms of hourly wages follows a similar pattern, but it is much larger in size due to the sectoral differences in hours of work. Of course the aforementioned compositional changes have exerted an influence on these trends. Controlling for such changes through an OLS regression on the pooled sample (see Table A.2 in the Appendix), gives a somewhat different picture. The net differential appears to have risen from 8.8% in 2009 to 14.6% in 2011 but to have subsequently dropped in 2013, though remaining higher than in 2009 (at 9.3%).

The temporal evolution of public wage premia calculated at the mean may of course mask diverse patterns across the wage distribution. Thus, we next examine changes by wage decile, with the necessary forewarning that they may be noisy, since they derive from a wage variable that is reported in bundles.[12] As Figure 2 shows, in the first half of the crisis private sector wages fell more or less uniformly across the wage distribution, though slightly more for the low-paid. In contrast, public wage changes in that period were unsystematic, and they were even positive at the 2nd and 6th deciles. Such wage hikes can be explained by the discontinuation of many temporary low-pay contracts in 2010 but, also, they may indicate that public sector administrators countered the early wage cuts by expediting internal promotion. In the second half of the crisis, private sector wages dropped dramatically at the lower tail of the distribution, reflecting the cut in minimum wages. All other workers saw smaller wage declines, though still higher than those in the earlier period, with those at the 8th decile affected the least. Given the unification of the pay-scales that was applied in the largest part of the public sector during that period, the corresponding public wage changes were also negative and larger than before, but now formed a clear W-pattern, affecting less those at the tails and at the median of the wage distribution.

These differential changes in sectoral wages across the distribution translate into differential patterns in public sector premia. We show this in Figure 3, where we plot premia net of compositional changes in worker and job characteristics derived from quantile regressions on the pooled sample (full set of results available upon request). Comparing the light (2009) and dark (2013) solid lines, one can see small benefits for the low-paid and important losses for the high-paid in the public sector relative to their private sector counterparts. However, as with premia at the mean, changes over the full period conceal important changes across sub-periods. Over 2009-2011, driven by faster private wage adjustment, the public premium increased substantially across the board, exceeding 20% for the low-paid. It was over 2011-2012, when the unified pay scales were

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increases. This latter discrepancy concerns only our descriptive statistics, as our regression analysis controls for compositional changes.

[11] One may suspect that the hump-shaped pattern in public premia is driven by wages in the "wider" public sector which was subjected to fewer reforms and later on in the crisis. We show in Figure A1 in the Appendix that, in fact, the pattern is most evident in the "narrow" public sector (i.e. public services) and in local government.

[12] Researchers have used wages from the Greek LFS in quantile regressions before (e.g. Christopoulou and Monastiriotis 2013), producing premia consistent with evidence from continuous wages reported in other Greek surveys (Papapetrou 2006a, 2006b).

applied, that the premium fell. In fact, in 2012, the premium is almost linearly decreasing across wage quantiles, likely reflecting the abolition of benefits. Some of this fall was corrected in 2013.

These descriptive patterns reflect the significant compositional and valuation changes that have occurred in the two sectors during the various phases of the crisis. Of course, our analysis does not take into account annual bonuses (the so-called 13th and 14th salaries, covering bonuses for Christmas, Easter and paid holidays). Because these bonuses were significantly cut in the public sector but not in the private sector (at least, not formally), our results likely overestimate public sector premia. On the other hand, our data most probably fail to capture informal wage cuts in the private sector (e.g. in black market wages), which are commonly perceived to be large and widespread, especially at the lower end of the wage distribution. Therefore, it is also plausible that our results underestimate public sector premia. It is important to acknowledge both data limitations, though the former one should mostly affect our descriptive results. In principle, returns to sector-specific worker and job characteristics should be independent from non-regular annual bonuses (if such bonuses were in our data, they would be captured by the constant). We turn to the systematic analysis of these in the next section.

4. Econometric analysis

4.1. Wage structures and sector-selection

Previous studies have shown that there is significant selection of workers between the public and private sectors in Greece. It is, therefore, important to account for selection effects and test whether the crisis has affected their intensity. To do this, we follow the endogenous switching regression model and instrument the 'choice' of sector using an indicator of whether a worker has parents or a spouse employed in or retired from the public sector. Following Christopoulou and Monastiriotis (2013) and earlier studies cited therein, we hypothesise that this indicator (henceforth, 'public history') reflects both wider household preferences about the sector of employment and information/access advantages for public sector jobs. The results, for both the selection process and the wage returns in the two sectors, are reported in Table 2.[13]

The results suggest that before the crisis selection related to 'public history' has been significant. We estimate that having a household member employed in the public sector in 2009 was associated with a 43% higher probability of the individual being also employed in the public sector. Selection on this and correlated unobserved characteristics, however, did not affect wages for those individuals that obtained public-sector jobs (the 'rho' correlation coefficient is statistically insignificant). Instead, 'public history' translated to a wage penalty for those individuals who were 'wrongly' selected into the private sector: for them, we estimate a wage penalty in 2009 of 3% ('lamda' coefficient in the private-sector wage regression). Reading across columns, it is evident that this selection mechanism became weaker as the crisis progressed. In 2011 the influence of the 'public history' variable for an individual's selection into the public sector had declined to 37.6%, showing that, indeed, this variable reflected to a certain extent an accessibility issue. The private-sector penalty associated to possession of characteristics that selected an individual into the public sector almost doubled over this period, in turn suggesting that this sector was intensifying its wage sorting in favour of employees who possessed more private-sector-like characteristics. This effect, however, declined and became statistically insignificant by 2013, perhaps reflecting that with the pervasive job losses in the private sector (unemployment reaching 27% in the summer of 2013), even the possession of

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[13] For sector-specific wage regressions unadjusted for selection, see Table A3 in the Appendix.

unobserved characteristics more akin to the private sector was not sufficient to generate a wage advantage there. Consistently, the selection influence associated to public history declined further in that period to 31%.

Among the other characteristics that contribute to sector-selection, a few present statistically significant changes which are worth discussing. The selection of women away from the public sector declined over time, as they were rapidly losing their jobs in the private sector, which traditionally protects men as the primary bread-winners.[14] Likewise, the strong selection of non-natives away from the public sector halved by 2011, again because the private-sector job losses hit disproportionately non-natives, but re-emerged in 2013 as private-sector job-losses became more pervasive affecting more horizontally the population, irrespective of ethnicity. In a similar fashion, both part-time contracts (initially more pervasive in the private sector) and temporary contracts (initially more pervasive in the public sector) first diminished in the public sector but eventually recovered. These patterns make sense, as part-time and temporary public sector jobs were amongst the first to be shed away, and as many private-sector jobs were switched to part-time or temporary status.

The estimates of the second-stage wage regressions are also interesting. First, the female wage penalty has been consistently higher in the private sector throughout the crisis. Over 2009-2011, this premium increased in the private sector and decreased in the public sector and, thus, the female disadvantage in the private sector initially intensified. However, this change was fully restored by 2013. Further, the early stages of the crisis saw a fast convergence in the returns to education in the two sectors, with the public sector advantage (of some 20%) literally disappearing by 2011. This equalisation of the returns to education remained in 2013, with returns increasing notably in both sectors (by over 40% in total), showing the elevated significance of education not only for job-finding (Monastiriotis and Martelli, 2013) but also for one's wage outcomes once employed. The experience premium also saw increases of similar magnitude. The sectoral differential in this premium, which was statistically indistinguishable from zero before the crisis, initially increased, as the returns to experience increased faster in the public sector. However, the private sector caught up with the public sector at the second half of the crisis. This shows a pay disadvantage for young people in both sectors that comes on top of their disadvantage with respect to employment outcomes, as reflected in the exceptional rise in youth unemployment.

With regard to household characteristics (marital status and parenthood) changes have been less dramatic. The premium associated with being married, which was statistically equal across sectors for the duration of the crisis, remained rather unchanged. The premium associated with having children, which was significant only in the private sector, declined in the latter phase of the crisis and became statistically insignificant there also. In contrast, there is a significant differentiation between the two sectors with regard to the foreign-born penalty. While up to 2011 both sectors equally penalized foreign workers, in 2013 the public sector seems to offer a foreign-born premium (at the almost implausible rate of 18.6%). This result reflects the significant compositional changes that took place in the sector with regard to non-native employment, presumably with the public sector maintaining in its ranks only the highest-skilled/top-paid among its non-native employees.

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[14] This sizeable gender effect and its temporal evolution raise the question of whether one should conduct the analysis separately for men and women, thus testing for gender differences in both sector selection and in the returns to characteristics within sectors. We do this in Table A4 in the Appendix where we show that the effect of the instrument variable in the selection equation does not differ by sex. However, there are some other gender differences (e.g. regarding the wage penalties to being married and foreign born in the private sector), which we intend to explore in future work.

Among the job characteristics, part-time and temporary contracts entailed sizeable wage penalties which were statistically higher in the public sector over the entire period of study. These penalties initially deepened but eventually recovered in all cases apart from the penalty to having a temporary job in the private sector, which increased throughout (by a total of 35%). In turn, the small-firm penalty, after an initial increase in both sectors, fell to its original levels in the public sector but more than doubled in the private sector, clearly reflecting the deteriorating demand conditions in the country and the impact that this had, disproportionately, to small private-sector businesses. The overall effect of the fall in demand is also reflected in the evolution of the estimated intercepts, with the disadvantage observed for the private sector growing from 4.7% in 2009 to 8.4% in 2011 and falling slightly to 6.1% in 2013, despite the fact that public sector net wages also declined (by 7.2% over the entire period compared to 8.7% in the private sector).

Note that the decline in the estimated intercepts (showing 'baseline' wages net of individual and job characteristics) is notably lower than the decline in actual wages reported by official sources (and also recorded in our data as described in the previous section). This reaffirms our earlier conclusion that compositional changes have also been an important part of the story of labour market adjustment in Greece during the crisis. To examine these compositional changes, and their relative weight vis-à-vis changes in the valuation of workforce characteristics, we proceed with our decomposition analysis.

4.2. Decomposition of wage changes

We begin with the decompositions at the mean of the wage distribution, which we report in Table 3. The results corroborate the earlier finding that the impact of selection, although observable, is not particularly sizeable. Selection amplified total wage adjustment in the public sector by a non-trivial 5.3%, but in the private sector the effect was opposite and minimal (1.7%). Interestingly, this effect is driven entirely by developments in the second phase of the crisis, as the effect of selection in the two sectors in the first phase of the crisis worked in the opposite direction.

Having net out the selection effects, we find that the observed downward wage adjustment is more than fully explained by changes in the price components. While in almost all cases the endowment effects moved in the opposite direction, they were nowhere near sufficient to counter-balance the substantial wage adjustment in the country. In the public sector, endowment effects worked against downward wage adjustment by a factor of 18.7%; whereas in the private sector they were negligible (at 0.7% of the raw difference). As the detailed decomposition results show, the reason for this difference is that, while in the public sector compositional changes both in worker and job characteristics tended to push wages up, in the private sector these effects pushed in opposite directions, largely offsetting each other. Put differently, workforce quality improved with the crisis in both sectors, but job quality increased in the public sector and decreased in the private sector. Concerning the timing of these changes, the largest part of the compositional adjustment in the public sector took place early on in the crisis, which reflects again that this sector shed many temporary and part-time (i.e. low-skill and low-pay) jobs at that time. In the private sector, the deterioration in job quality happened immediately as soon as the crisis started and continued apace thereafter, but improvements in worker quality were more pronounced in the later phase.

The movement of the price components was similarly non-uniform, despite the overall downward influence (by 113% and 103% in the two sectors, respectively). In the public sector, returns to worker characteristics have worked to increase wages while returns to job characteristics worked in the opposite direction. In absolute value, these effects were similar (corresponding to 30% and 28% of the raw wage change, respectively) and thus cancelled out. In contrast, in the private sector, the

returns to both worker and job characteristics worked to increase wages. Favourable worker characteristics were valued higher after the crisis (in ceteris paribus terms), so that they counteracted wage declines by a very large 60.8%, while the corresponding effect of job characteristics was even higher, at 66.5% of the raw wage change. In both cases, the main component driving the downward movement of wages has been the price effect corresponding to the constant. This effect gives a measure of the shock experienced in each sector, as it represents a horizontal change in baseline wages after controlling for wage changes that are due to compositional and valuation changes in terms of workforce and job characteristics. According to the results, the effect is large in the public sector (at -0.2997 it represents a 'baseline' adjustment of 115.5% of the total raw change) but it is really devastating in the private sector (-0.7406 or 230% of the corresponding raw change), thus showing how the negative demand shock, but also adjustment to it, was more sizeable in that sector.

When comparing sub-periods we find that this private sector shock increased as the crisis deepened and as wage-setting was liberalised, while the countervailing effects remained on average roughly unchanged. The only difference is that the worker price-effects became more pronounced in the second half of the crisis while the job price-effects were more pronounced in the first half (as did the corresponding endowment effects). On the contrary, the negative 'baseline adjustment' in public wage was equally sizeable throughout the crisis, but the countervailing forces were stronger in the first half of the crisis and weaker in the second half. Although the initial wage-cut did take effect (as seen in the decline of the 'baseline' component by 0.15 log-points) a large part of it was counterbalanced by the simultaneous move towards a more favourable valuation of worker characteristics (equivalent to a total-wage rise of 0.16 log-points) as well as by the smaller improvements in the endowment components. In a way this explains why policy efforts, which were hugely unpopular and costly in political terms, took so long to take effect. In contrast, when the valuation of worker characteristics was rationalised (in/after 2011), actual public sector wages declined much faster.

To delve deeper in these patterns, we turn to the decomposition results by wage decile, which we report in Figure 4. As with the results at the mean of the distribution, we find that composition effects due to changes in worker and job characteristics had a minor contribution to wage changes across deciles; price effects due to worker and job characteristics had a moderate and mostly positive contribution; and the constant effect had the highest negative influence in both sectors. However, the mean decompositions conceal that, over 2009-2013, price effects due to worker and job characteristics were in fact negative at the low deciles in both sectors. In contrast, worker and job price effects favoured workers at the 3rd-5th wage deciles in the public sector, and those at the upper end of the distribution in the private sector, i.e. exactly where the negative constant effect was highest. This suggests that, the way the public sector adjusted its rewards to worker and job characteristics during the crisis favoured the low-paid, while private sector adjustments favoured the high-skilled highly-paid workers. Admittedly, the constant effect in the public sector was positive at the very low wage deciles, and overall more sizeable than what the decomposition at the mean suggests. This is more obvious when one compares sub-periods, with the mean decompositions suggesting that the constant effect was stable over time but the quantile decomposition showing a huge increase over time (from a nearly positive effect over 2009-2011 to a highly negative effect in 2011-2013). We attribute these results to underlying selection effects, for which we have not controlled. [15] Because they are less affected by selection bias, t^{he} ^{r}esults from the private sector are

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[15] We base this inference on decomposition results at the mean of the wage distribution without adjustment for sector selection, which we report in Table A5 in the Appendix. As this table shows (and in comparison with Table 3), failure to control for selection significantly biases the magnitude of the estimated price effects in the public sector. In particular, when we do not correct for selection bias, the constant effect appears significantly larger overall, and much larger in the second half of the crisis relative to the first half, which is exactly what we

more reliable. These results suggest that the crisis (i.e. the 'baseline adjustment' captured by the constant) initially affected wages more or less uniformly across the wage distribution but, as the crisis escalated, those who were affected the most were at the tails of the wage distribution; i.e. the minimum wage earners and the high-skill highly-paid employees.

5. Conclusion

The crisis in Greece has been largely presented as a crisis of, and in, the public sector. Indeed, public sector workers saw remarkable wage cuts, while an effective hiring freeze and some downsizing was also implemented, as the country struggled to deal with pressures to consolidate its public finances. Nevertheless, the private sector was also, and in some respects more deeply, affected. Apart from the dramatic developments with respect to (un)employment outcomes, private sector wages also declined substantially, owing of course to the collapse of public and private demand and the liquidity problems that the crisis transmitted to private businesses through the destabilised banking sector. These developments had not only a sectoral character, representing different adjustment trajectories and pressures in the private and public sectors, but also a temporal dimension, as labour market and policy pressures in the two sectors took place at different points in time and at different speeds.

Motivated by these developments, in this paper we exploited the timely availability of micro-data from the Greek LFS and applied contemporary micro-econometric techniques to examine the compositional and valuation dynamics underpinning the observed wage adjustments not only over the whole period (2009-2013) but also across two constituent sub-periods. Of course, this was not an arbitrary choice. Despite its severity, the Greek crisis unfolded rather slowly and in a prolonged fashion. Between 2009 and 2011, the (centre-left) government of the time imposed fiscal austerity measures (including public-sector wage-cuts) with relative brevity, facing huge opposition both by the public and in parliament. Following the loss of confidence of this government in November 2011, the country has since been led by a coalition government (between the party formerly in government and the main centre-right party, which was a strong anti-austerity force while in opposition). This government has implemented further cuts in the public sector and a much more pervasive programme of labour market and wage deregulation. The political turbulence of 2011 had a devastating effect on the Greek economy, as fears about a sudden exit from the Eurozone led to a further collapse in private demand, as well as domestic and foreign investment, and an immense liquidity problem throughout the economy. Thus, in more than one ways, the crisis in Greece has had at least two phases – and in many respects it can be argued to have had also two faces, one for the private and one for the public sector.

The results from our regression and decomposition analyses confirm these observations and vindicate our approach to the issue. They are in line with existing narratives of the labour market effects of the crisis in Greece, but they also shed light to new angles of the crisis and provide confirmatory evidence to support and quantify them. Among our headline findings, the one that perhaps stands out concerns the overall wage adjustment between sectors and periods: in the public sector monthly regular wages took a long time to adjust and only fell significantly after 2011; in contrast, the corresponding wages in the private sector were affected faster and overall more deeply, even prior to the wave of measures that deregulated wage bargaining and lowered minimum wage-floors. Importantly, this result remains not only when we control for sector-selection

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find in the quantile decompositions. Importantly, correcting for selection does no not affect the direction of the price effects.

(which, despite some changing patterns, does not seem to have had a big influence to overall wage changes) but also when we control for the actual changes to workforce/job characteristics (i.e., accounting for the fact that those falling into unemployment are not a random draw from the pool of existing employees). In all cases, wage adjustment in the private sector appears to be larger and to have started earlier compared to the public sector. As a result of this, and against common perception, the monthly public wage premium increased in the early phase of the crisis and only started falling after 2011, though never decreasing below its 2009 level. In fact, the fall in public wage premia affected mostly the least privileged public sector workers, i.e. those in high-skill high-pay jobs who before the crisis were earning the lowest wage premia. In contrast, the wage reforms tended to protect public employees at the lower end of the wage distribution; that is, those who were already the most privileged compared to their private sector counterrparts.

Underneath this finding, however, are substantial differences in the way in which prices (both in terms of 'baseline' wages and with regard to specific worker and job characteristics) have adjusted in the two sectors. Our results suggest that in the private sector demand pressures were strong and continuous, affecting initially all skill levels and later the high skilled. Importantly, however, these pressures were partly offset by an intensification of wage-sorting, with a significant rise in the returns to marketable workforce characteristics, including most notably the returns to schooling (as well as by smaller increases in the returns to job characteristics and the quality of workers). In the public sector in turn, adjustment was slower and more muted in the beginning of the crisis, as this sector also rewarded worker characteristics higher than before (and saw some improvement in the composition of workers and jobs). After 2011, however, the rationalisation of pay-scales in that sector led to a relative reduction in the price/valuation of marketable workforce characteristics, impacting mostly the high-skilled.

Given the initial differences in returns between the two sectors, these austerity-led developments – albeit painful– are not completely discouraging. The changes in returns in the private sector, in particular, is a rather positive development, as returns in this sector have been traditionally low, thus acting as a disincentive to seeking private-sector dependent employment and further reinforcing the selection of the more skilled and more educated into the public sector. The correction of these imbalances may be the most important, and perhaps the only, 'good news' coming out from the crisis for the Greek labour market.

6. References

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Figure 1. Wage patterns over 2009-2013 at the mean of the wage distribution

A. Mean real monthly wages by sector (in euros)
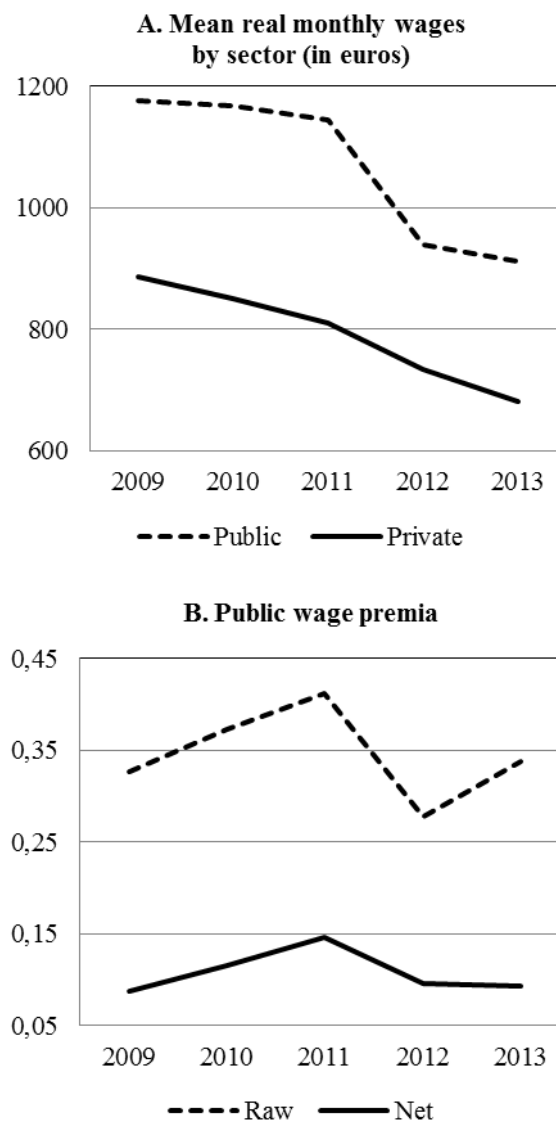

B. Public wage premia

Figure 2. Change in public and private wages across the wage distribution in selected periods
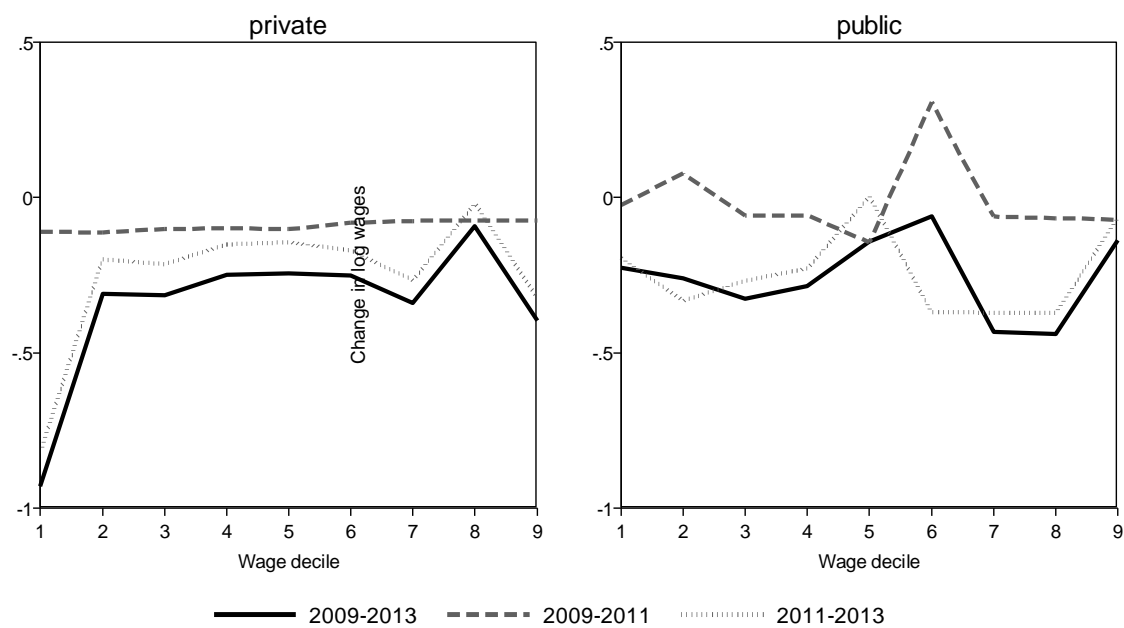
Figure 3. Public wage premia net of worker and job characteristics across the wage distribution by calendar year
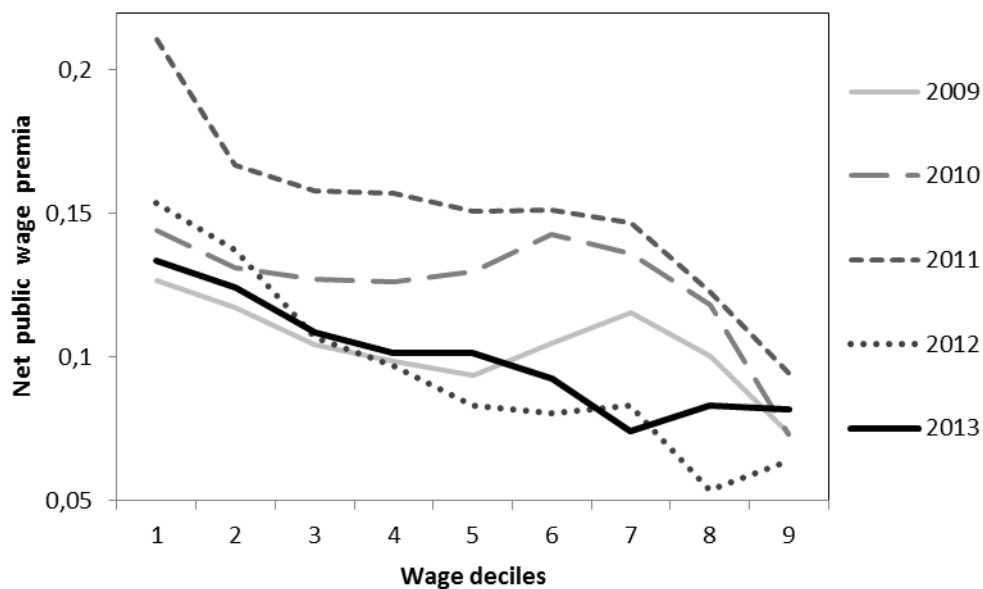
Figure 4. Decomposition of wage-changes across the wage distribution
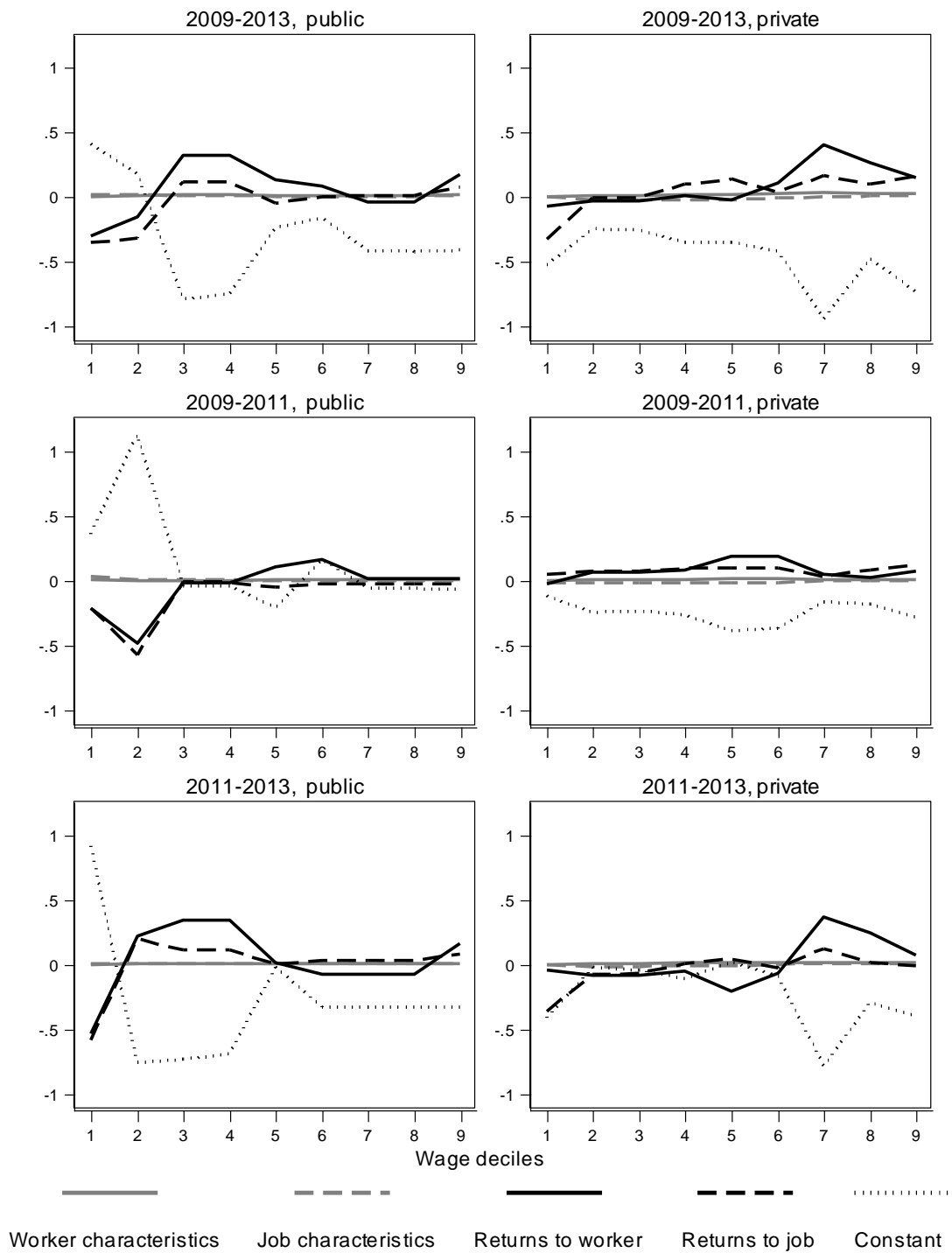
Table 1. Weighted means and frequencies of selected variables by sector and year

		2009	2010	2011	2012	2013
Public sector	Females	0.461	0.469	0.464	0.459	0.457
	Education in years	14.78	14.96	15.14	15.24	15.45
	Experience in years	21.50	21.62	22.11	22.25	21.88
	Married/Cohabitating	0.678	0.688	0.702	0.694	0.703
	Has child/ren	0.437	0.434	0.465	0.439	0.448
	Foreign born	0.010	0.009	0.010	0.007	0.005
	Part-time worker	0.029	0.026	0.024	0.021	0.020
	Temporary worker	0.097	0.094	0.070	0.067	0.080
	Small firm	0.212	0.203	0.208	0.169	0.153
	Production sectors: secondary	0.070	0.064	0.054	0.056	0.057
	Production sectors: tertiary	0.919	0.928	0.938	0.936	0.936
	Occupation: White collar	0.788	0.790	0.813	0.808	0.793
	Occupation: Blue collar	0.153	0.147	0.125	0.130	0.136
	Nominal monthly wage in euros	1322	1373	1388	1150	1107
	Weekly hour of work	36.12	36.10	36.22	36.96	37.20
	Observations	5,633	5,527	4,694	3,505	3,212
Private sector	Females	0.415	0.421	0.423	0.439	0.431
	Education in years	12.42	12.56	12.75	13.16	13.14
	Experience in years	18.69	19.08	19.27	19.15	19.74
	Married/Cohabitating	0.555	0.572	0.570	0.574	0.596
	Has child/ren	0.346	0.366	0.361	0.366	0.392
	Foreign born	0.199	0.192	0.199	0.171	0.166
	Part-time worker	0.066	0.074	0.082	0.110	0.140
	Temporary worker	0.134	0.146	0.149	0.118	0.118
	Small firm	0.563	0.564	0.562	0.520	0.509
	Production sectors: secondary	0.328	0.305	0.275	0.245	0.236
	Production sectors: tertiary	0.646	0.662	0.694	0.720	0.727
	Occupation: White collar	0.553	0.570	0.596	0.637	0.636
	Occupation: Blue collar	0.447	0.430	0.404	0.362	0.364
	Nominal monthly wage in euros	996.5	1000	983.2	900.1	827.5
	Weekly hour of work	41.40	41.08	40.65	39.98	39.61
	Observations	9,746	9,659	7,826	5,677	5,065

Notes: Public sector includes public services, public bodies, local governments, public utility enterprises, public or public-controlled banks, and public-controlled firms. Reference production sector is primary, and reference occupation category is armed forces.

Table 2. Public-private wage structures under endogenous sector selection in selected years

	2009			2011			2013		
	Public	Private	Selection	Public	Private	Selection	Public	Private	Selection
Female	-0.0666***	-0.1355***	-0.2126***	-0.0475***	-0.1461***	-0.1426***	-0.0632***	-0.1182***	-0.1207**
	[0.0081]	[0.0075]	[0.0428]	[0.0082]	[0.0080]	[0.0459]	[0.0107]	[0.0116]	[0.0580]
Education	0.0192***	0.0153***	0.0603***	0.0208***	0.0202***	0.0512***	0.0274***	0.0233***	0.0595***
	[0.0016]	[0.0012]	[0.0079]	[0.0017]	[0.0014]	[0.0082]	[0.0022]	[0.0020]	[0.0103]
Experience	0.0167***	0.0148***	0.0484***	0.0186***	0.0140***	0.0525***	0.0235***	0.0242***	0.0360***
	[0.0017]	[0.0011]	[0.0062]	[0.0016]	[0.0013]	[0.0070]	[0.0026]	[0.0020]	[0.0097]
Experience^2	-0.0002***	-0.0002***	-0.0003***	-0.0002***	-0.0002***	-0.0003**	-0.0003***	-0.0003***	-0.0001
	[0.0000]	[0.0000]	[0.0001]	[0.0000]	[0.0000]	[0.0001]	[0.0001]	[0.0000]	[0.0002]
Married	0.0381***	0.0514***	-0.0550	0.0444***	0.0696***	-0.0238	0.0368***	0.0545***	0.0159
	[0.0104]	[0.0085]	[0.0504]	[0.0104]	[0.0102]	[0.0554]	[0.0133]	[0.0142]	[0.0660]
Children	0.0023	0.0267***	0.0570	-0.0027	0.0425***	0.0590	-0.0045	0.0223*	0.0441
	[0.0090]	[0.0080]	[0.0455]	[0.0090]	[0.0094]	[0.0504]	[0.0116]	[0.0135]	[0.0595]
Non-Greek	-0.1057**	-0.1194***	-0.7423***	-0.1523***	-0.1289***	-0.3949***	0.1865*	-0.1189***	-0.6820***
	[0.0451]	[0.0094]	[0.1208]	[0.0499]	[0.0114]	[0.1296]	[0.1084]	[0.0182]	[0.2079]
Part-time	-0.6128***	-0.4314***	-1.2806***	-0.6899***	-0.5469***	-1.4868***	-0.6583***	-0.4581***	-1.4548***
	[0.0490]	[0.0245]	[0.1075]	[0.0520]	[0.0259]	[0.1289]	[0.0636]	[0.0299]	[0.1508]
Temporary	-0.2902***	-0.0744***	0.1648***	-0.3340***	-0.0951***	0.0769	-0.2583***	-0.1001***	0.1924**
	[0.0209]	[0.0110]	[0.0623]	[0.0230]	[0.0123]	[0.0717]	[0.0276]	[0.0190]	[0.0918]
Small firm	-0.0294***	-0.0460***	-0.5090***	-0.0602***	-0.0645***	-0.4570***	-0.0276**	-0.1121***	-0.5640***
	[0.0095]	[0.0069]	[0.0401]	[0.0097]	[0.0076]	[0.0450]	[0.0136]	[0.0116]	[0.0589]
Weekly hours	0.0027***	0.0075***	-0.0489***	0.0009	0.0093***	-0.0464***	0.0049***	0.0098***	-0.0316***
	[0.0008]	[0.0006]	[0.0034]	[0.0008]	[0.0007]	[0.0039]	[0.0011]	[0.0010]	[0.0042]
Constant	6.5033***	6.2000***	-0.1933	6.5144***	5.9286***	-1.1197***	6.0334***	5.6631***	-2.1980***
	[0.0661]	[0.0521]	[0.2832]	[0.0678]	[0.0570]	[0.3276]	[0.1375]	[0.0841]	[0.4140]
Public history			0.4306***			0.3766***			0.3101***
			[0.0473]			[0.0515]			[0.0645]
Rho	-0.0793	-0.0997**		-0.0510	-0.1417**		-0.0709	-0.1474	
	[0.0554]	[0.0483]		[0.0474]	[0.0705]		[0.0522]	[0.0995]	
Lamda	-0.02146	-0.02972		-0.01235	-0.04351		-0.01855	-0.05357	

Robust standard errors in brackets, *** p<0.01, ** p<0.05, * p<0.1. Controls: Sector dummies, occupation dummies, region dummies. Observations are 15379 in year 2009, 12520 in 2011, and 8277 in 2013. The Wald test statistics [and corresponding p-values] for the independence of the selection equations are 6.391 [0.041] in 2009; 5.364 [0.068] in 2011; and 4.184 [0.123] in 2013. Rho (ρ) is the correlation coefficient between the error terms in the selection equation and the relevant wage equation. Multiplying this with the standard deviation of the errors of the wage equation (σ_u) returns the coefficient on the inverse Mills ratio (λ), which shows whether selectivity impacts directly on individuals' wages. Since $\sigma_u > 0$, the sign of the coefficient on λ is determined solely by ρ.

Table 3. Blinder-Oaxaca decomposition of mean real wage changes by period, sector and type of characteristics

	Full period		2009-11		2011-13	
	Public	**Private**	**Public**	**Private**	**Public**	**Private**
Raw wage difference	-0.2594 [0.0006]	-0.3222 [0.0006]	-0.0215 [0.0006]	-0.1073 [0.0005]	-0.2379 [0.0006]	-0.2149 [0.0007]
Selection-adjusted difference	-0.2457 [0.0012]	-0.3277 [0.0008]	-0.0407 [0.0010]	-0.1045 [0.0007]	-0.2050 [0.0011]	-0.2232 [0.0009]
Selection effect	-0.0137	0.0056	0.0192	-0.0028	-0.0329	0.0084
Endowment effects						
Total	0.0484 [0.0005]	0.0028 [0.0005]	0.0367 [0.0004]	-0.0071 [0.0004]	0.0128 [0.0005]	0.0038 [0.0005]
Worker	0.0252 [0.0003]	0.0377 [0.0002]	0.0177 [0.0002]	0.0132 [0.0002]	0.0053 [0.0002]	0.0216 [0.0002]
Job	0.0232 [0.0004]	-0.0349 [0.0004]	0.0190 [0.0003]	-0.0203 [0.0003]	0.0076 [0.0004]	-0.0179 [0.0004]
Price effects						
Total	-0.2941 [0.0012]	-0.3305 [0.0007]	-0.0774 [0.0010]	-0.0973 [0.0006]	-0.2178 [0.0011]	-0.2270 [0.0007]
Worker	0.0787 [0.0051]	0.1958 [0.0029]	0.1626 [0.0043]	0.0855 [0.0024]	-0.0817 [0.0051]	0.1132 [0.0031]
Job	-0.0731 [0.0042]	0.2143 [0.0030]	-0.0878 [0.0035]	0.1458 [0.0047]	0.0114 [0.0044]	0.0717 [0.0049]
Constant	-0.2997 [0.0078]	-0.7406 [0.0040]	-0.1522 [0.0062]	-0.3287 [0.0051]	-0.1475 [0.0078]	-0.4119 [0.0056]

Notes: Reported wage gap is in the logged wages. Analytical standard errors (calculated by the Delta method) are in brackets. Worker characteristics are: female, education, experience, marital status, whether has child/ren, foreign-born. Job characteristics are: sector, occupation, region, part-time contract, temporary contract, small firm, hours of work). Coefficients of dummy variables adjusted to reflect deviations from the mean rather than from the reference category (i.e., they sum up to zero over all categories).

Figure A1. Public wage premia net of worker and job characteristics by public sub-sector and calendar year
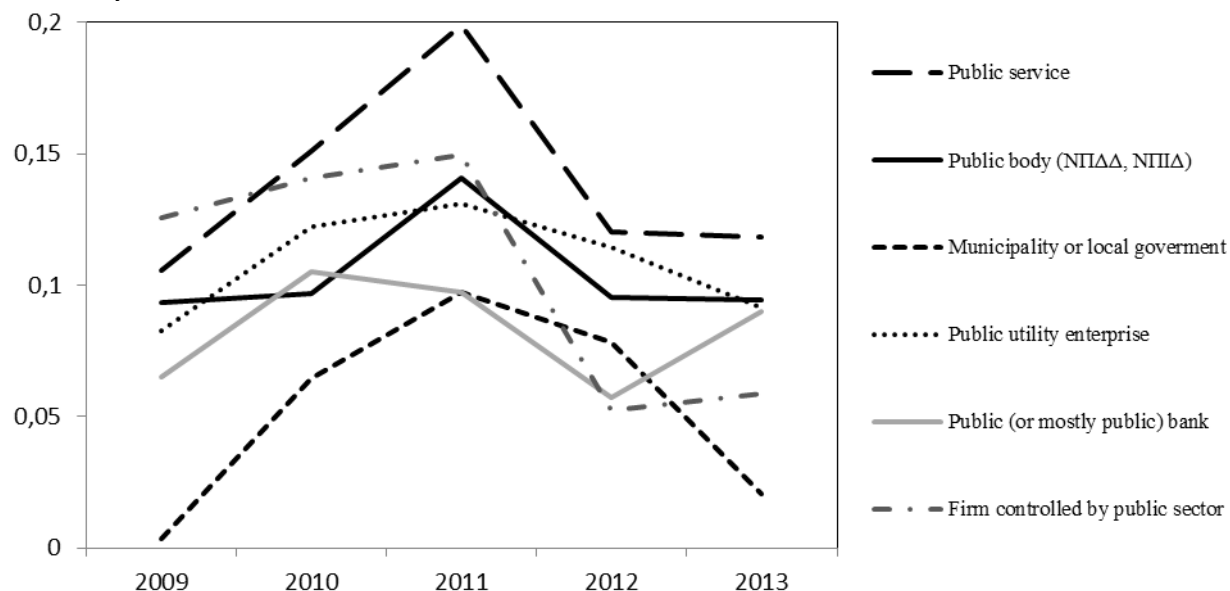
Notes: Controls as for Table A2. Full set of results is available upon request.

Table A1. Employment size and wage bill by sector

Indicator	2009	2010	2011	2012	2013
Private sector					
Estimated employment[a]	1,642,000	1,567,000	1,388,000	1,241,000	1,091,000
Estimated monthly wage bill[b]	1,636,253,000	1,567,000,000	1,364,681,600	1,117,024,100	902,802,5
Public sector					
Estimated employment[a]	894,057	858,360	789,478	704,801	639,197
Estimated monthly wage bill[b]	1,181,943,354	1,178,528,280	1,095,795,464	810,521,150	707,591,0
Actual employment[c]	907,351	834,505	747,356	713,258	
Actual annual wage bill[d]	31,020,000,000	27,713,000,000	25,700,000,000	23,948,000,000	

Notes: Wage bills are in nominal values. Correlation of estimated and actual public employment is 0.95. Correlation of estimated monthly and actual annual wage bill is 0.8. [a]Weighted LFS sample. [b]Weighted sample times mean nominal wage. Excludes non-regular bonuses (including 13th and 14th salaries). [c]Count by the Ministry of Administrative Reform (http://apografi.yap.gov.gr/apografi/Flows_2009_2012.htm, accessed on 24/3/2014). [d]Total compensation of employees in General Government. Source: Eurostat.

Table A2. OLS estimates of extended Mincer equations of real monthly wage

	2009	2010	2011	2012	2013
Public sector	0.0879***	0.1157***	0.1462***	0.0961***	0.0932***
	[0.0100]	[0.0101]	[0.0126]	[0.0162]	[0.0173]
Female	-0.1145***	-0.1135***	-0.1106***	-0.0915***	-0.1037***
	[0.0061]	[0.0060]	[0.0068]	[0.0084]	[0.0092]
Education	0.0175***	0.0185***	0.0225***	0.0203***	0.0254***
	[0.0011]	[0.0011]	[0.0012]	[0.0017]	[0.0017]
Experience	0.0164***	0.0184***	0.0169***	0.0153***	0.0255***
	[0.0010]	[0.0009]	[0.0011]	[0.0016]	[0.0018]
Exp. squared	-0.0002***	-0.0002***	-0.0002***	-0.0002***	-0.0003***
	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]
Married	0.0447***	0.0393***	0.0550***	0.0333***	0.0546***
	[0.0072]	[0.0073]	[0.0084]	[0.0110]	[0.0118]
Child/ren	0.0160**	0.0437***	0.0265***	0.0334***	0.0077
	[0.0065]	[0.0067]	[0.0077]	[0.0104]	[0.0104]
Foreign born	-0.1145***	-0.1117***	-0.1057***	-0.0873***	-0.0984***
	[0.0096]	[0.0107]	[0.0122]	[0.0170]	[0.0196]
Part-time	-0.4832***	-0.5754***	-0.6153***	-0.5770***	-0.5172***
	[0.0237]	[0.0225]	[0.0250]	[0.0285]	[0.0276]
Temporary	-0.1405***	-0.1831***	-0.1610***	-0.1244***	-0.1648***
	[0.0110]	[0.0116]	[0.0125]	[0.0190]	[0.0181]
Small firm	-0.0444***	-0.0637***	-0.0771***	-0.0746***	-0.0997***
	[0.0061]	[0.0062]	[0.0071]	[0.0089]	[0.0102]
Weekly hours	0.0062***	0.0070***	0.0067***	0.0079***	0.0088***
	[0.0005]	[0.0005]	[0.0006]	[0.0007]	[0.0008]
Constant	6.1695***	6.0013***	5.9645***	5.9176***	5.6419***
	[0.0431]	[0.0416]	[0.0497]	[0.0570]	[0.0630]
Observations	15,379	15,186	12,520	9,182	8,277
R-squared	0.529	0.594	0.617	0.560	0.596

Robust standard errors in brackets, *** $p<0.01$, ** $p<0.05$, * $p<0.1$. Controls: Sector dummies, occupation dummies, region dummies.

Table A3. OLS estimates of extended Mincer equations of real monthly wage by year and sector

	Public sector					Private sector				
	yr09	yr10	yr11	yr12	yr13	yr09	yr10	yr11	yr12	yr13
Female	-0.0615***	-0.0532***	-0.0397***	-0.0342***	-0.0627***	-0.1304***	-0.1376***	-0.1451***	-0.1179***	-0.1178***
	[0.0090]	[0.0092]	[0.0101]	[0.0116]	[0.0120]	[0.0082]	[0.0079]	[0.0088]	[0.0115]	[0.0129]
Education	0.0200***	0.0203***	0.0231***	0.0201***	0.0275***	0.0160***	0.0176***	0.0223***	0.0208***	0.0242***
	[0.0017]	[0.0017]	[0.0019]	[0.0025]	[0.0024]	[0.0013]	[0.0014]	[0.0015]	[0.0021]	[0.0022]
Experience	0.0164***	0.0195***	0.0191***	0.0108***	0.0247***	0.0151***	0.0169***	0.0145***	0.0165***	0.0247***
	[0.0017]	[0.0016]	[0.0020]	[0.0026]	[0.0029]	[0.0012]	[0.0012]	[0.0014]	[0.0019]	[0.0023]
Exp. squared	-0.0002***	-0.0002***	-0.0002***	-0.0001	-0.0003***	-0.0002***	-0.0002***	-0.0002***	-0.0002***	-0.0004***
	[0.0000]	[0.0000]	[0.0000]	[0.0001]	[0.0001]	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]
Married	0.0265**	0.0269**	0.0363***	0.0446***	0.0345**	0.0495***	0.0423***	0.0621***	0.0249*	0.0627***
	[0.0109]	[0.0107]	[0.0112]	[0.0141]	[0.0150]	[0.0092]	[0.0095]	[0.0112]	[0.0150]	[0.0160]
Child/ren	0.0059	0.0253***	0.0038	0.0042	-0.0051	0.0244***	0.0554***	0.0462***	0.0522***	0.0183
	[0.0096]	[0.0090]	[0.0099]	[0.0132]	[0.0131]	[0.0086]	[0.0091]	[0.0107]	[0.0145]	[0.0146]
Foreign born	-0.0918**	-0.1804***	-0.1601***	-0.0834	0.1505	-0.1269***	-0.1243***	-0.1226***	-0.1011***	-0.1204***
	[0.0408]	[0.0484]	[0.0503]	[0.0611]	[0.1016]	[0.0100]	[0.0111]	[0.0126]	[0.0179]	[0.0203]
Part-time	-0.6285***	-0.6121***	-0.6696***	-0.5576***	-0.6033***	-0.4282***	-0.5378***	-0.5546***	-0.5203***	-0.4654***
	[0.0537]	[0.0518]	[0.0596]	[0.0666]	[0.0684]	[0.0263]	[0.0255]	[0.0280]	[0.0333]	[0.0327]
Temporary	-0.2923***	-0.3589***	-0.3392***	-0.2609***	-0.2579***	-0.0742***	-0.1118***	-0.1053***	-0.0768***	-0.1129***
	[0.0231]	[0.0244]	[0.0278]	[0.0381]	[0.0305]	[0.0121]	[0.0127]	[0.0135]	[0.0217]	[0.0225]
Small firm	-0.0416***	-0.0396***	-0.0686***	-0.0271**	-0.0283*	-0.0428***	-0.0664***	-0.0751***	-0.0893***	-0.1166***
	[0.0103]	[0.0107]	[0.0113]	[0.0131]	[0.0147]	[0.0074]	[0.0074]	[0.0086]	[0.0110]	[0.0126]
Weekly hours	0.0027***	0.0039***	0.0003	0.0029***	0.0049***	0.0077***	0.0083***	0.0090***	0.0105***	0.0107***
	[0.0009]	[0.0008]	[0.0010]	[0.0010]	[0.0011]	[0.0006]	[0.0006]	[0.0007]	[0.0010]	[0.0011]
Constant	6.4876***	6.4355***	6.4865***	6.2455***	5.9889***	5.8925***	6.0109***	5.8063***	6.0129***	5.1401***
	[0.0743]	[0.0597]	[0.0755]	[0.1303]	[0.1447]	[0.0493]	[0.0533]	[0.0504]	[0.1414]	[0.0825]
Observations	5,633	5,527	4,694	3,505	3,212	9,746	9,659	7,826	5,677	5,065
R-squared	0.481	0.532	0.531	0.426	0.509	0.487	0.557	0.575	0.551	0.572

Robust standard errors in brackets, *** p<0.01, ** p<0.05, * p<0.1. Controls: Sector dummies, occupation dummies, region dummies.

Table A4. Endogenous switching regressions by selected year, fully interacted model by gender

	2009			2011			2013		
	Public	Private	Selection	Public	Private	Selection	Public	Private	Selection
Female	0.0518	-0.2213**	-0.5778	0.0600	-0.0721	0.2295	0.0215	0.1383	-1.2022
	[0.1827]	[0.1127]	[0.6103]	[0.1477]	[0.1330]	[0.7069]	[0.2000]	[0.1798]	[0.8505]
Female*Educ	0.0029	0.0038	0.0171	0.0028	-0.0006	-0.0253	0.0018	-0.0076*	0.0032
	[0.0035]	[0.0025]	[0.0162]	[0.0037]	[0.0029]	[0.0171]	[0.0045]	[0.0042]	[0.0211]
Female*Exp	0.0027	0.0042*	-0.0126	-0.0011	0.0012	-0.0068	0.0074	0.0024	-0.0163
	[0.0033]	[0.0023]	[0.0130]	[0.0033]	[0.0026]	[0.0144]	[0.0051]	[0.0040]	[0.0207]
Female*Exp^2	-0.0000	-0.0001**	0.0004	0.0000	-0.0001	0.0003	-0.0001	-0.0001	0.0005
	[0.0001]	[0.0001]	[0.0003]	[0.0001]	[0.0001]	[0.0003]	[0.0001]	[0.0001]	[0.0005]
Female*Married	-0.0137	-0.0654***	0.0063	-0.0055	-0.0531***	-0.1762	-0.0088	-0.0378	-0.0668
	[0.0203]	[0.0168]	[0.1031]	[0.0204]	[0.0202]	[0.1143]	[0.0263]	[0.0281]	[0.1374]
Female*Children	-0.0171	-0.0238	0.0319	-0.0452**	-0.0294	0.0691	0.0018	-0.0126	0.3064**
	[0.0182]	[0.0165]	[0.0927]	[0.0179]	[0.0191]	[0.1018]	[0.0235]	[0.0272]	[0.1229]
Female*Non-Greek	-0.0720	0.0642***	-0.0243	0.0440	0.0507**	-0.4209	-0.3607**	-0.0174	-0.5499
	[0.0789]	[0.0209]	[0.2446]	[0.1015]	[0.0246]	[0.2600]	[0.1814]	[0.0373]	[0.3468]
Female*Part-time	-0.1686	0.0203	0.0797	-0.0922	-0.0474	0.4572	-0.0351	-0.1006*	-0.6792**
	[0.1060]	[0.0519]	[0.2574]	[0.1248]	[0.0518]	[0.3028]	[0.1300]	[0.0595]	[0.3139]
Female*Temporary	-0.0745*	0.0015	0.2800**	0.0129	0.0086	0.1023	0.0859	0.0707*	0.3171*
	[0.0399]	[0.0223]	[0.1285]	[0.0464]	[0.0245]	[0.1444]	[0.0549]	[0.0379]	[0.1756]
Female*Small firm	0.0059	-0.0270*	-0.0222	-0.0191	-0.0004	-0.2131**	-0.0064	0.0328	-0.0253
	[0.0182]	[0.0141]	[0.0809]	[0.0192]	[0.0156]	[0.0908]	[0.0263]	[0.0226]	[0.1182]
Female*Hours	0.0007	0.0032***	0.0093	-0.0012	0.0001	0.0225***	0.0011	-0.0010	0.0049
	[0.0016]	[0.0012]	[0.0069]	[0.0016]	[0.0014]	[0.0084]	[0.0022]	[0.0019]	[0.0083]
Education	0.0183***	0.0130***	0.0550***	0.0190***	0.0196***	0.0646***	0.0266***	0.0259***	0.0618***
	[0.0017]	[0.0015]	[0.0103]	[0.0020]	[0.0017]	[0.0104]	[0.0028]	[0.0026]	[0.0142]
Experience	0.0156***	0.0139***	0.0551***	0.0196***	0.0145***	0.0552***	0.0196***	0.0240***	0.0422***
	[0.0021]	[0.0014]	[0.0092]	[0.0022]	[0.0017]	[0.0102]	[0.0029]	[0.0029]	[0.0146]
Experience^2	-0.0002***	-0.0002***	-0.0005***	-0.0002***	-0.0002***	-0.0004**	-0.0002***	-0.0003***	-0.0003
	[0.0000]	[0.0000]	[0.0002]	[0.0000]	[0.0000]	[0.0002]	[0.0001]	[0.0001]	[0.0003]
Married	0.0459***	0.0850***	-0.0538	0.0484***	0.0926***	0.0715	0.0437**	0.0711***	0.0543
	[0.0133]	[0.0114]	[0.0762]	[0.0141]	[0.0136]	[0.0838]	[0.0191]	[0.0208]	[0.1055]
Children	0.0100	0.0285***	0.0416	0.0167	0.0472***	0.0258	-0.0021	0.0206	-0.0961
	[0.0110]	[0.0102]	[0.0646]	[0.0116]	[0.0120]	[0.0710]	[0.0156]	[0.0195]	[0.0892]
Non-Greek	-0.0531	-0.1436***	-0.7457***	-0.1684**	-0.1481***	-0.2257	0.3228**	-0.1055***	-0.5404**
	[0.0420]	[0.0111]	[0.1641]	[0.0775]	[0.0138]	[0.1607]	[0.1484]	[0.0229]	[0.2444]
Part-time	-0.4429***	-0.4190***	-1.2693***	-0.5977***	-0.5117***	-1.7660***	-0.6450***	-0.3971***	-0.9880***
	[0.0890]	[0.0395]	[0.2175]	[0.1098]	[0.0354]	[0.2547]	[0.1003]	[0.0421]	[0.2483]
Temporary	-0.2527***	-0.0746***	0.0135	-0.3446***	-0.1000***	0.0466	-0.3034***	-0.1349***	0.0298
	[0.0251]	[0.0139]	[0.0976]	[0.0353]	[0.0161]	[0.1044]	[0.0349]	[0.0274]	[0.1282]
Small firm	-0.0311**	-0.0346***	-0.5119***	-0.0450***	-0.0676***	-0.3656***	-0.0169	-0.1219***	-0.5751***
	[0.0123]	[0.0087]	[0.0548]	[0.0130]	[0.0094]	[0.0633]	[0.0188]	[0.0152]	[0.0826]
Weekly hours	0.0026***	0.0062***	-0.0523***	0.0020**	0.0092***	-0.0573***	0.0043***	0.0103***	-0.0328***
	[0.0010]	[0.0007]	[0.0047]	[0.0010]	[0.0007]	[0.0059]	[0.0013]	[0.0012]	[0.0056]
Constant	6.4746***	6.2433***	-0.0284	6.4246***	5.8972***	-1.2053***	6.0985***	5.5578***	-2.3470***
	[0.0691]	[0.0617]	[0.3665]	[0.0947]	[0.0635]	[0.4351]	[0.1540]	[0.1044]	[0.5492]
Female*pub. history			0.0115			0.1157			-0.0271
			[0.0959]			[0.1044]			[0.1312]
Public history			0.4293***			0.3366***			0.3454***
			[0.0678]			[0.0705]			[0.0940]
Rho	-0.0786	-0.1433***		-0.0664	-0.1814**		-0.0779	-0.1847*	
	[0.0610]	[0.0453]		[0.0557]	[0.0737]		[0.0672]	[0.0984]	
Lamda	-0.02101	-0.04243		-0.01591	-0.05533		-0.02005	-0.06668	

Robust standard errors in brackets, *** p<0.01, ** p<0.05, * p<0.1. Controls: Sector dummies, occupation dummies, region dummies, and their full interactions with the female dummy. Observations are 15379 in year 2009, 12520 in 2011, and 8277 in 2013. The Wald test statistics [and corresponding p-values] for the independence of the selection equations are 11.78 [0.003] in 2009; 7.731 [0.021] in 2011; and 5.062 [0.080] in 2013. All other information, as for Table2.

Table A5. Blinder-Oaxaca decomposition of mean real wage changes by period, sector and type of characteristics (results not adjusted for selection)

	Full period		2009-11		2011-13	
	Public	**Private**	**Public**	**Private**	**Public**	**Private**
Raw wage difference	-0.2594 [0.0006]	-0.3222 [0.0006]	-0.0215 [0.0006]	-0.1073 [0.0005]	-0.2379 [0.0006]	-0.2149 [0.0007]
Endowment effects						
Total	0.0548 [0.0005]	0.0066 [0.0005]	0.0364 [0.0004]	-0.0060 [0.0004]	0.0161 [0.0005]	0.0053 [0.0005]
Worker	0.0267 [0.0003]	0.0392 [0.0002]	0.0178 [0.0002]	0.0135 [0.0002]	0.0057 [0.0002]	0.0225 [0.0002]
Job	0.0281 [0.0004]	-0.0326 [0.0004]	0.0186 [0.0003]	-0.0195 [0.0003]	0.0104 [0.0004]	-0.0172 [0.0004]
Price effects						
Total	-0.3142 [0.0005]	-0.3288 [0.0005]	-0.0579 [0.0004]	-0.1013 [0.0004]	-0.2540 [0.0005]	-0.2202 [0.0005]
Worker	0.1076 [0.0046]	0.1964 [0.0027]	0.1189 [0.0039]	0.0874 [0.0023]	-0.0086 [0.0046]	0.1191 [0.0029]
Job	-0.0151 [0.0036]	0.2128 [0.0026]	-0.1158 [0.0033]	0.1561 [0.0045]	0.0986 [0.0037]	0.0585 [0.0047]
Constant	-0.4067 [0.0055]	-0.7380 [0.0038]	-0.0610 [0.0048]	-0.3448 [0.0050]	-0.3440 [0.0055]	-0.3978 [0.0055]

Notes: Reported wage gap is in the logged wages. Analytical standard errors (calculated by the Delta method) are in brackets. Worker characteristics are: female, education, experience, marital status, whether has child/ren, foreign-born. Job characteristics are: sector, occupation, region, part-time contract, temporary contract, small firm, hours of work). Coefficients of dummy variables adjusted to reflect deviations from the mean rather than from the reference category (i.e., they sum up to zero over all categories).