

THE PUBLIC-PRIVATE WAGE GAP  
IN THE EURO AREA A DECADE AFTER  
THE SOVEREIGN DEBT CRISIS

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## Abstract

The most recent fiscal adjustment episode in the euro area occurred during the so-called euro area sovereign debt crisis. It affected many countries and was quite significantly impacted by the public wage bill. The austerity measures contributed, in particular, to an immediate partial correction of positive public–private pay differentials, most notably in countries subject to the EU’s financial assistance programmes. An important aspect of the debate on public wage bill restraint concerns how long such policies can be sustained over time. In this paper, we investigate whether the downward corrections that were initially observed in many countries were permanent or ended up being transitory (i.e. whether they were reversed in subsequent years). To do so, we focus on euro area countries over the 2007–2021 period, so as to have sufficient observations in both the pre- and post- adjustment periods. We estimate the wage differential, controlling for observable differences between individuals using cross-sectional microdata from a harmonized survey (the European Union Statistics on Income and Living Conditions (EU-SILC)). We show that the lower wage premiums only partially reverted to pre-fiscal consolidation levels over the subsequent decade and that more sustained policy achievements are linked to larger fiscal adjustment efforts during the 2010–2014 crisis.

**Keywords:** fiscal consolidation, government spending, public sector wage gap.

**JEL classification:** C21, J31, J45, E62, H2, H5.

## Resumen

El episodio de ajuste fiscal más reciente en la zona del euro ocurrió durante la llamada crisis de la deuda soberana en dicha zona. Afectó a muchos países y dependió bastante significativamente de la masa salarial pública. Las medidas de austeridad contribuyeron, en particular, a una corrección parcial inmediata de los diferenciales de pago público-privado positivos, especialmente en los países sujetos a los programas de asistencia financiera de la UE. Un aspecto importante del debate sobre la restricción de la masa salarial pública se refiere a cuánto tiempo pueden sostenerse estas políticas con el tiempo. En este documento, nos preguntamos si las correcciones a la baja que se observaron inicialmente en muchos países resultaron ser permanentes o terminaron siendo transitorias (es decir, si se revirtieron en los años siguientes). Para hacerlo, nos enfocamos en los países de la zona del euro durante el período 2007-2021, para tener suficientes observaciones antes y después del período de ajuste. Estimamos el diferencial salarial controlando las diferencias observables entre individuos utilizando microdatos de la encuesta transversal EU-SILC (European Union Statistics on Income and Living Conditions). Mostramos que las primas salariales más bajas solo se revirtieron parcialmente a los niveles previos a la consolidación fiscal durante la década siguiente, y que los logros de políticas más sostenidos están vinculados a mayores esfuerzos de ajuste fiscal durante la crisis de 2010-2014.

**Palabras clave:** consolidación fiscal, gasto público, brecha salarial entre empleo público y privado.

**Códigos JEL:** C21, J31, J45, E62, H2, H5.

# 1 Introduction

The most recent fiscal adjustment episode in the euro area, which took place over 2010–2014 during the so-called euro area sovereign debt crisis, relied quite significantly on the public wage bill. Policy measures affecting public employment and real wages accounted for about a third of the total reduction in public expenditure in countries subject to the EU’s financial assistance programmes (Ireland, Portugal, Greece and Cyprus, which lost market access, and Spain, which maintained it), and to a lesser extent in Italy, which suffered market stress, while in other countries such as France and Germany, the public wage bill followed more moderate dynamics than overall public expenditure (see Figure 1). Specific measures taken included wage cuts and wage freezes (in most cases focused on certain salary groups), increased working hours, non-renewal of temporary contracts and general public administration reforms.<sup>1</sup> A number of papers have found evidence that the austerity measures implemented during the crisis contributed to the partial correction by 2013–2014 of the positive public–private pay differential in countries subject to programmes (see Pérez et al., 2016; Campos et al., 2017; Sławińska, 2021).

An important aspect of the debate on public wage bill restraint concerns how long such policies can be sustained over time. With regard to real public wages, historical experience shows that catch-up processes in good economic times tend to partially or completely offset crisis-related budgetary savings, in particular when inflation is high (Checherita-Westphal and Vlad, 2023). Moreover, several articles signal that higher public–private wage differentials can shape the ability of the public sector to attract highly skilled workers (Strauss and de la Maisonneuve, 2009). This in turn may affect the quality of public employment, which directly translates into the quality of institutions and the efficiency of public administration. Along these lines, in addition, measures that compress the public wage distribution by reducing the top wages to a larger extent than lower-level wages can also worsen the composition of the public labour force (Ikeuchi et al., 2024).

On different grounds, given that public wage policies have implications for overall economic competitiveness and stability (Abdallah et al., 2023),<sup>2</sup> it has been argued that

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<sup>1</sup>See Appendix IIIa in Pérez et al. (2016) for the specific policy measures taken. Other EU countries also adjusted public wages and/or employment during this period and the preceding global financial crisis, namely Slovenia, Slovakia, Estonia, Latvia and Lithuania.

<sup>2</sup>The study of the links between public and private sector labour wages has attracted significant attention in Europe over the past decades. In a context in which the public sector is subject to political constraints while the private sector is subject to profit constraints, the literature finds, among other stylized facts, that (i) the public sector pays higher wages than the private sector in most economies, with significant heterogeneity across countries (Giordano et al., 2011; Ghinetti and Lucifora, 2013; Sławińska, 2021); (ii) the premium is higher for female workers, workers at the lower end of the wage distribution and younger workers (Depalo et al., 2015; Bonaccolto-Töpfer et al., 2022; Fenizia et al., 2023); (iii) wages are more compressed along the skill distribution within the public sector (Lausev, 2014; Gomes, 2023); (iv) segmented public–private sectors affect education decisions and the amount of skilled workers for private-sector jobs (Borjas, 2002; Bargain and Melly, 2008; Geromichalos and Kospentaris, 2022; Chassamboulli and Gomes, 2023); (v) government wage expenditure tends to be pro-cyclical (Lamo et al., 2013); (vi) the wage-setting behaviour of both sectors is connected (Lamo et al., 2012; Dolton and Hantzsche, 2024).

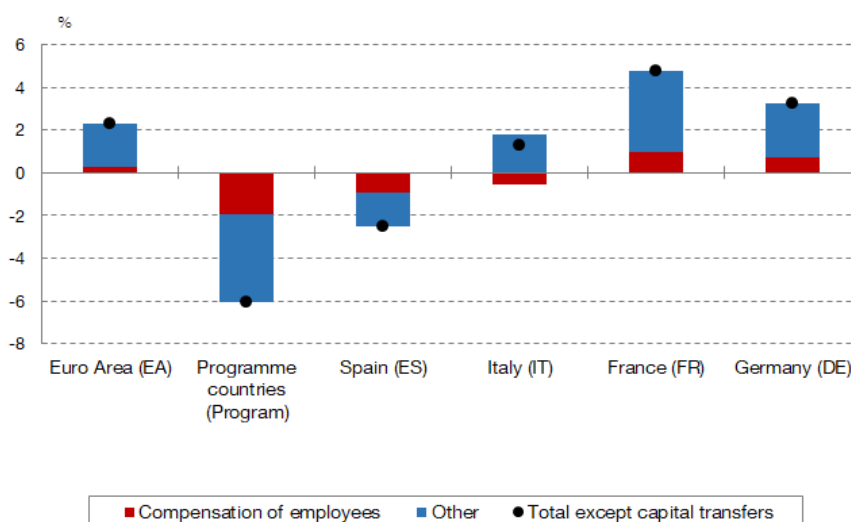
in times requiring fiscal consolidation, a government wage bill adjustment may yield so-called non-Keynesian effects that could help mitigate the effects of fiscal retrenchment and thus facilitate a more permanent adjustment of public spending, especially when coupled with structural reforms (Alesina and Perotti, 1996; Holm-Hadulla et al., 2010; Forte and Magazzino, 2016; Forni and Novta, 2016; Alesina et al., 2019; Chang et al., 2021), although some works qualify this hypothesis (Heylen and Everaert, 2000; Wiese et al., 2018). Among other channels, it is argued that government wage bill cuts, in contrast to other instruments such as tax hikes and investment cuts, benefit from favourable credibility and expectation effects on demand, as well as from beneficial supply effects. One such channel that runs through the labour market operates as follows: lower government spending on wages could lead to lower private wages and give room to lower labour taxes that, in turn, would increase private investment as investors anticipate higher profits. In addition, the probability that economic agents consider fiscal consolidation to be long lasting will be higher when it relies mainly on government wage bill and transfer cuts. The operation of this channel stems from the fact that such public spending items are considered to be more politically sensitive and display more inertia in government budgets and thus are harder to cut/adjust, signalling the resolve of the government towards the fiscal adjustment plan (Alesina and Perotti, 1996; Alesina et al., 2019).

Against this backdrop, in this paper we focus on the dynamics of the public–private pay gap, one specific variable that was directly affected by the euro area sovereign debt crisis fiscal consolidation episode. We pose the question of whether the downward corrections that were initially observed in many countries were permanent or ended up being transitory (i.e. whether they were reversed in subsequent years). To do so, we focus on euro area countries from 2007–2021, so as to have enough observations in both the pre- and post-adjustment periods. We estimate the wage differential controlling for observable differences between individuals. We use cross-sectional microdata from a harmonized survey, the European Union Statistics on Income and Living Conditions (EU-SILC), and our findings reveal that the diminished wage premiums only made a partial recovery to the levels seen before fiscal consolidation in the subsequent ten years. Furthermore, we find that more sustained policy achievements are linked to larger fiscal adjustment efforts during the 2010–2014 crisis.

The remainder of the paper is organized as follows. In Section 2, we discuss the data used and the methodological approach to computing the public–private wage gap. In Section 3, we present the baseline results for the estimated public–private wage gap (Section 3.1), link the dynamics of the gap over the past decade to some characteristics of the fiscal consolidation efforts (Section 3.2) and illustrate how cross-country heterogeneity in gaps is related to the structure of the economies in question (Section 3.3). Finally, Section 4 offers some concluding remarks.



Figure 1: Change in government spending between 2010 and 2014 (% of 2014 GDP).



Notes: The figure shows the change in the shown variables (general government expenditure, compensation of employees and other expenditure) between 2014 and 2010 as a percentage of 2014 GDP. General government capital transfers are excluded from total expenditure as in those years they were affected by one-off effects related to the aid/bail-out granted to the banking sector in the context of the global financial crisis. Programme countries: Ireland, Portugal, Greece and Cyprus.

## 2 Data and methodology

### 2.1 The data

We use micro-data from Eurostat’s EU-SILC survey for the 2007–2021 period. This survey collects comparable cross-sectional yearly data on income and living conditions for European Union countries.<sup>3</sup> The most recent data refers to the 2022 EU-SILC wave, which includes employment and earnings information pertaining to 2021. We take all individuals with a gross salary income greater than zero in each year, comprising 96% of the whole sample of individuals who report a number of months spent as an employee. In addition, to minimize the problem of outliers we drop from the sample respondents reporting hourly wages above the 99th percentile of the distribution, per year and per country. We also exclude individuals with missing values for the variables needed for our study. In total, our sample represents almost 110 million wage earners, on average, over the period considered. In comparison with National Accounts statistics, our sample amounts to 83% and 78% of the National Accounts data for employees and the wage bill, respectively. In Section A of the Appendix, we report the sample size used in the analysis: Table A.1 reports this information by year for the public and private sectors and the euro area as a whole; Figure A.1 depicts the yearly sample coverage with respect to National Accounts data for the public and private sector wage bill and the euro area as a whole; Table A.2 reports the sample size by country for the whole period and for selected years.

<sup>3</sup>EU-SILC micro-data are also available for 2004 and 2005, but not for all countries for some of the relevant variables. Moreover, data for 2006 are affected by the transition period during which countries adapted to common standards. Finally, the period with available data is 2010–2021 for Croatia.

Regarding the definition of *public sector*, as EU-SILC classifies economic sectors according to NACE Rev.2, we use an approximation based on the aggregation of the *O* (Public Administration and Defense, Compulsory Social Security), *P* (Education) and *Q* (Health and Social Work) sectors of the NACE (Nomenclature des Activités Économiques dans la Communauté Européenne) classification.

For wages, we use as a reference variable hourly wages, calculated on an annual basis as the ratio between gross salary income and the number of hours worked. In turn, this number is obtained drawing on the number of months in which the individual's main activity was paid employment (full-time or part-time) and the number of weekly hours usually worked as an employee. However, EU-SILC considers figures referring to the year prior to the survey in the case of an employee's income and the number of months spent as an employee. It is therefore necessary to synchronise these variables with the hours worked per week. For this purpose, we adjust each individual observation using the year-on-year growth rate of the variables' respective averages, calculated by country and public or private sector.<sup>4</sup> For the wage income and the number of months worked, Figure B.1 in Section B of the Appendix shows the evolution of the annual averages of the original series and of the adjusted series between 2007 and 2022, for the euro area as a whole. In addition, this figure compares original and adjusted micro series for wages to the reference macro variable as provided by National Accounts statistics. Based on this comparison, gross wages as reported in EU-SILC data are lower than those obtained from National Accounts, especially for the private sector (see Figures B.1a and B.1b). This may be due to differences in the target population,<sup>5</sup> illegal or parallel-economy activities, and survey microdata measurement errors (e.g. in the imputation of values due to nonresponses or temporary adjustments to the number of hours worked that the survey is unable to capture fully).<sup>6</sup>

## 2.2 Methodology

To estimate the portion of the wage gap that cannot be accounted for by (observable) individual characteristics, we use the standard Oaxaca–Blinder decomposition (Blinder,

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<sup>4</sup>Note that it is not feasible to adjust the data using individual-specific year-on-year growth rates, as our dataset is not structured in a panel format. Attempts to utilize more disaggregated growth rates, calculated on the basis of cells defined by the same variables used as covariates in the main analysis, proved ineffective. These attempts resulted in aggregate changes that significantly diverged from those observed in National Accounts, particularly during crisis years such as 2020, when composition effects were notably pronounced. Furthermore, the use of EU-SILC longitudinal data has been also discarded, as it is also not free of such compositional effects and its sample size is smaller than that of the cross-sectional data. Note that the type of adjustment used, built on the basis of sector and country, could introduce measurement error since we inflate the wage of each individual at  $t - 1$  with the same growth rate for the whole reference sector of a country. However, if this measurement error is equal between the public be affected.

<sup>5</sup>The reference population in EU-SILC excludes certain groups that the National Accounts do include in the resident population, such as persons living in collective households and in institutions, in addition to people who have died or emigrated over the course of the year.

<sup>6</sup>See Törmäletho (2019).

1973; Oaxaca, 1973). It is important to note that with the structure and content of the EU-SILC database it is not possible to control for sample selection bias stemming from the possibility that sorting of employees between sectors is not random but occurs on the basis of unobserved characteristics. In any case, the richness of our database and the method used provide a well-proven way of looking at the issue when considering comparable datasets for multiple countries. The method has been used in studies covering a wide array of topics, from inequality to discrimination and demographics, to explain the change in the means of an outcome variable between groups.

We decompose the difference in average earnings between public and private workers into an explained component given by differences in skills and characteristics and an unexplained component given by differences in coefficients. Formally, let  $y_i$  be individual  $i$ 's logarithmic hourly wage in a given year. We assign an index equal to 1 or 0 if he/she works in the public or private sector, assigning  $Public = 1$  and  $Private = 0$ , such that we consider the following regressions for each sector:

$$y_{i1} = X_{i1}\beta_1 + u_{i1}, E(u_{i1} = 0); \quad (1)$$

$$y_{i0} = X_{i0}\beta_0 + u_{i0}, E(u_{i0} = 0), \quad (2)$$

where  $X_i$  is the set of covariates, which includes binary variables denoting marital status, low or high education, managerial position, part-time job and gender, as well as year and region (2-digit NUTS) fixed effects and a second-degree polynomial of demeaned experience.<sup>7</sup> Due to data limitations, our set of covariates does not allow controlling for other relevant characteristics that may influence the wage differential (e.g. non-monetary factors such as job security). In any case, our choice is in line with previous literature (e.g. Campos et al., 2017 and the references quoted therein). We demean experience by subtracting from each observation the average value calculated over the entire sample. The descriptive statistics for these variables are reported in Table B.1 in Section B of the Appendix.

Let  $E(X_1)\beta_0$  be a counterfactual wage that measures the average wage we would observe if public workers were paid as private workers. Then, the average difference in wages between the two sectors is

$$E(y_1) - E(y_0) = E(x_1)\beta_1 - E(X_0)\beta_0 + E(X_1)\beta_0 - E(X_1)\beta_0; \quad (3)$$

$$E(y_1) - E(y_0) = \underbrace{\beta_0 [E(x_1) - E(X_0)]}_{\text{Characteristics Effect (Explained)}} + \underbrace{E(X_1)(\beta_1 - \beta_0)}_{\text{Coefficient Effect (Unexplained)}}. \quad (4)$$

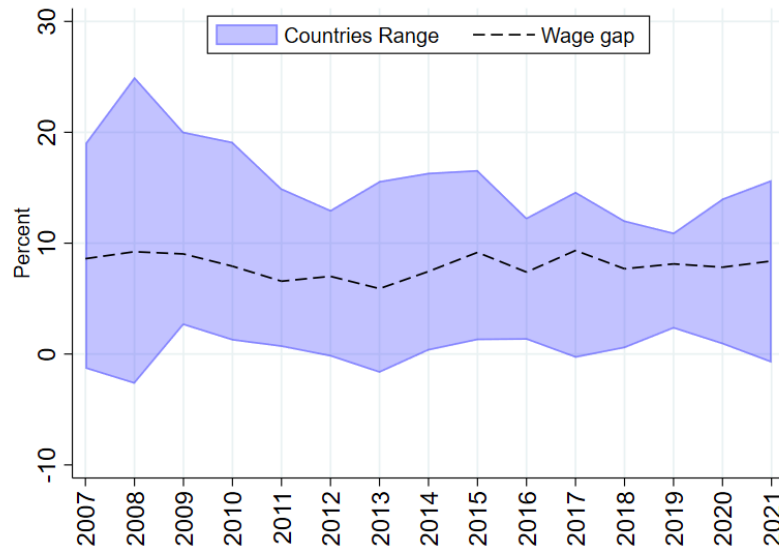
The first term on the right-hand side of Equation (4) is the characteristics effect (the component explained by differences in the composition of the staff in each sector). The

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<sup>7</sup>Age minus 20 proxies experience whenever information on this variable is not available.

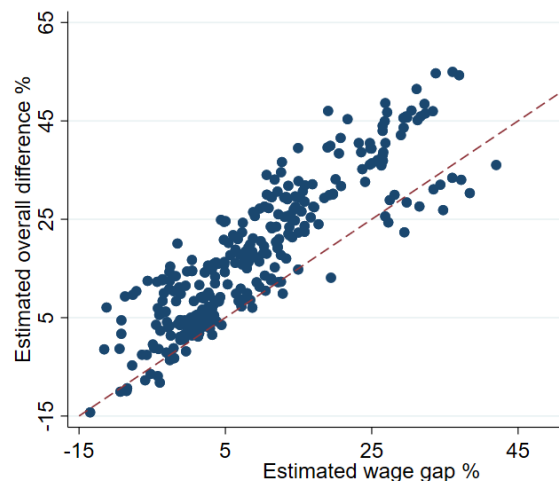
second term is the wage gap, which measures the difference in wages (or the returns to the covariates) if the skill set of the workers is held constant. Fixed effects capture structural differences between countries – for instance, the sectoral composition of the economy – that are stable over time. If these differences were to be altered, our estimates could be affected.

Figure 2: Evolution of the estimated wage gap over time: euro area (pool of countries) and countries' ranges.



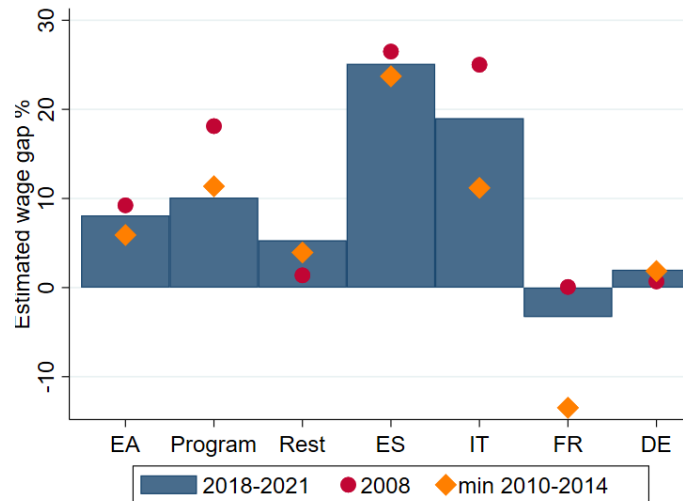
Note: This figure shows the estimated wage gaps between the public and the private sectors (controlling for individual covariates), estimated using the Blinder–Oaxaca decomposition method.

Figure 3: The estimated wage gap versus the difference in public–private wages without controlling for individual characteristics



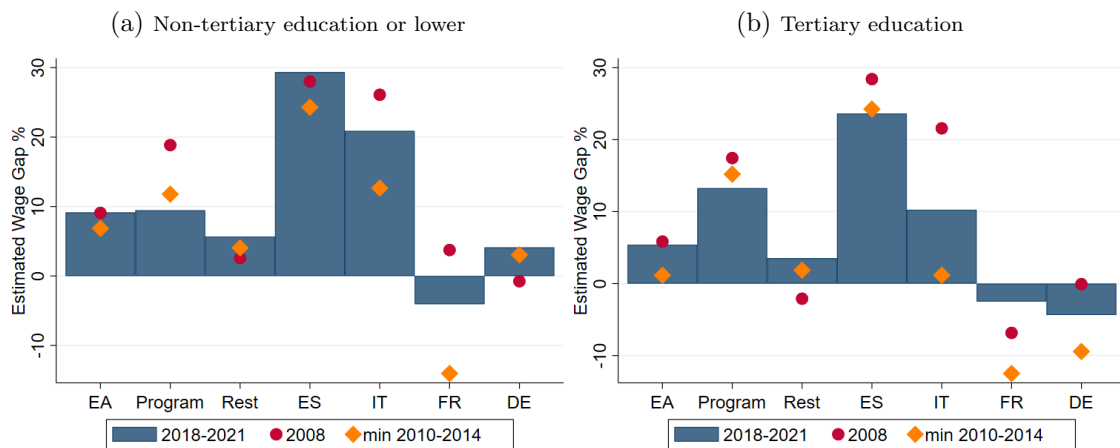
Notes: This figure shows the wage gap for each year of the 2007–2021 period and all euro area countries. The estimated wage gap between the public and the private sectors (controlling for individual covariates) is shown in the horizontal axis. The vertical axis shows the overall wage difference among public and private employees without controlling for individual covariates.

Figure 4: Estimated wage gap, comparison of selected time periods: pre-fiscal consolidation (2008); fiscal consolidation (2010–2014); most recent period (2018–2021).



Notes: This figure shows the estimated wage gap between the public and the private sector (controlling for individual covariates), obtained using the Oaxaca–Blinder decomposition, for each country or group of countries for selected years and periods. Programme countries: Ireland, Portugal, Greece and Cyprus. Other countries: the Netherlands, Belgium, Austria, Finland, Slovakia, Luxembourg, Croatia, Lithuania, Slovenia, Latvia, Estonia and Malta.

Figure 5: Estimated wage gap by level of education.



Notes: The figures show the estimated wage gap between the public and the private sector (controlling for individual covariates) for different levels of education, obtained using the Oaxaca–Blinder decomposition, for each country or group of countries for selected years. Programme countries: Ireland, Portugal, Greece and Cyprus. Other countries: the Netherlands, Belgium, Austria, Finland, Slovakia, Luxembourg, Croatia, Lithuania, Slovenia, Latvia, Estonia and Malta.

### 3 Results

#### 3.1 The wage gap

Figure 2 shows the evolution of the estimated public–private pay differential for the pool of euro area countries over time and the range of country-specific estimates. The estimated wage gap for the euro area as a whole was close to 10% in 2007 (dashed line in Figure 2). Then it decreased to 7.5% by 2014 after the fiscal consolidation episode. In the

following period of economic recovery, it increased to around 8.4% by 2021, still below its pre-financial crisis level. The range of estimated wage gaps across countries shrank after the maxima of 2007–2008. The Covid-19 crisis does not seem to have substantially affected the public–private pay gap for the euro area as a whole.

Individual characteristics account for a substantial fraction of the observed public–private wage gap. The estimated wage gap conditional on characteristics over the 2007–2021 period is about 50% lower than the estimated unconditional wage gap, a result that is expected since observable characteristics between the two sectors are different, e.g. in the public sector workers are better educated than in the private sector, on average, and there is a stronger presence of women and part-time employment (see Table B.1). Indeed, most observations in Figure 3 are located above the 45-degree line. For the 2007–2021 period taken as a whole, positive and statistically significant conditional wage gaps are estimated for all euro area countries except France and Latvia (see Table C.1 in Section C of the Appendix).

The wage gap was broadly similar for the euro area as a whole when comparing 2008 (pre-global financial crisis and pre-fiscal consolidation year), the fiscal consolidation episode (minimum value within the years 2010–2014) and the most recent period (average of 2018–2021) (Figure 4). This picture for the aggregate is similar to those of three of the largest economies, namely Germany, Spain and (broadly) France, while more variability is seen for Italy. In this latter case, as in the average of Ireland, Portugal, Greece and Cyprus, the wage gap is estimated to be lower in the most recent period than in 2008. In addition, in this latter group of countries the gap today remains at the minimum levels it reached during the fiscal consolidation episode of 2010–2014.

Looking at wage premiums by level of education (Figure 5), at the euro area aggregate level the gap for both lower-skilled and higher-skilled workers is nowadays almost at the same level as in 2008, even though that of employees with tertiary education saw a transitory reduction during the fiscal consolidation episode. Across countries, there is some heterogeneity, however, and three results stand out. First, the gap for Ireland, Portugal, Greece and Cyprus decreased on both sides of the skill distribution, but more so for workers with non-tertiary education or lower, where the gap is nowadays lower than that for higher-skilled workers. Second, in Italy there was also a reduction between 2008 and 2018–2021 at both ends of the distribution, but this was more marked for employees with tertiary education, quite likely because specific austerity measures were enacted for workers at the upper end of the skill distribution (Pérez et al., 2016). Third, a reduction at that end of the skill distribution is also visible in Spain when comparing 2018–2021 with 2008, although to a lesser extent than in Italy in quantitative terms (since policy measures for high-skilled workers were also enacted in Spain) ; compared to the level during the fiscal consolidation episode, the reduction of the gap for those with tertiary

education took place during that episode, whereas in the case of lower-skill workers the initial reduction was reversed in the post-2014 period.

### 3.2 The public–private wage gap and fiscal consolidation episode

The heterogeneity among countries reported in the previous section regarding the change in the public–private wage gap over time can be attributed, at least to some extent, to the fiscal consolidation episode if this affected public wages. We explore the plausibility of this hypothesis in Figure 6.

In that figure, we link changes in the wage gap to (i) the size of the fiscal consolidation effort during the episode of 2010–2014 (panels 6a and 6b); (ii) the size of the fiscal consolidation effort attributable to the adjustment of public expenditure (panel 6c); (iii) the size of the fiscal consolidation effort attributable to the adjustment of the public wage bill (panel 6d); (iv) the reformist impulse, measured first by changes in indicators of government effectiveness<sup>8</sup> (panel 6e) and, second, by changes in indicators of public administration reforms taken over 2010 to 2014 – some of which show a wide range, especially in countries under financial assistance programmes but not constrained to them (panel 6f). In the latter case, we follow Asatryan et al. (2017) and use alternative indicators from the database on micro-economic reforms from the European Commission (MICREF): measuring and/or reducing administrative costs; rationalising public administrative services; public ownership/privatisation; administrative regulation in general, which refers to measures not included in the previous categories or that do not aim to improve the quality of regulations or e-Government.

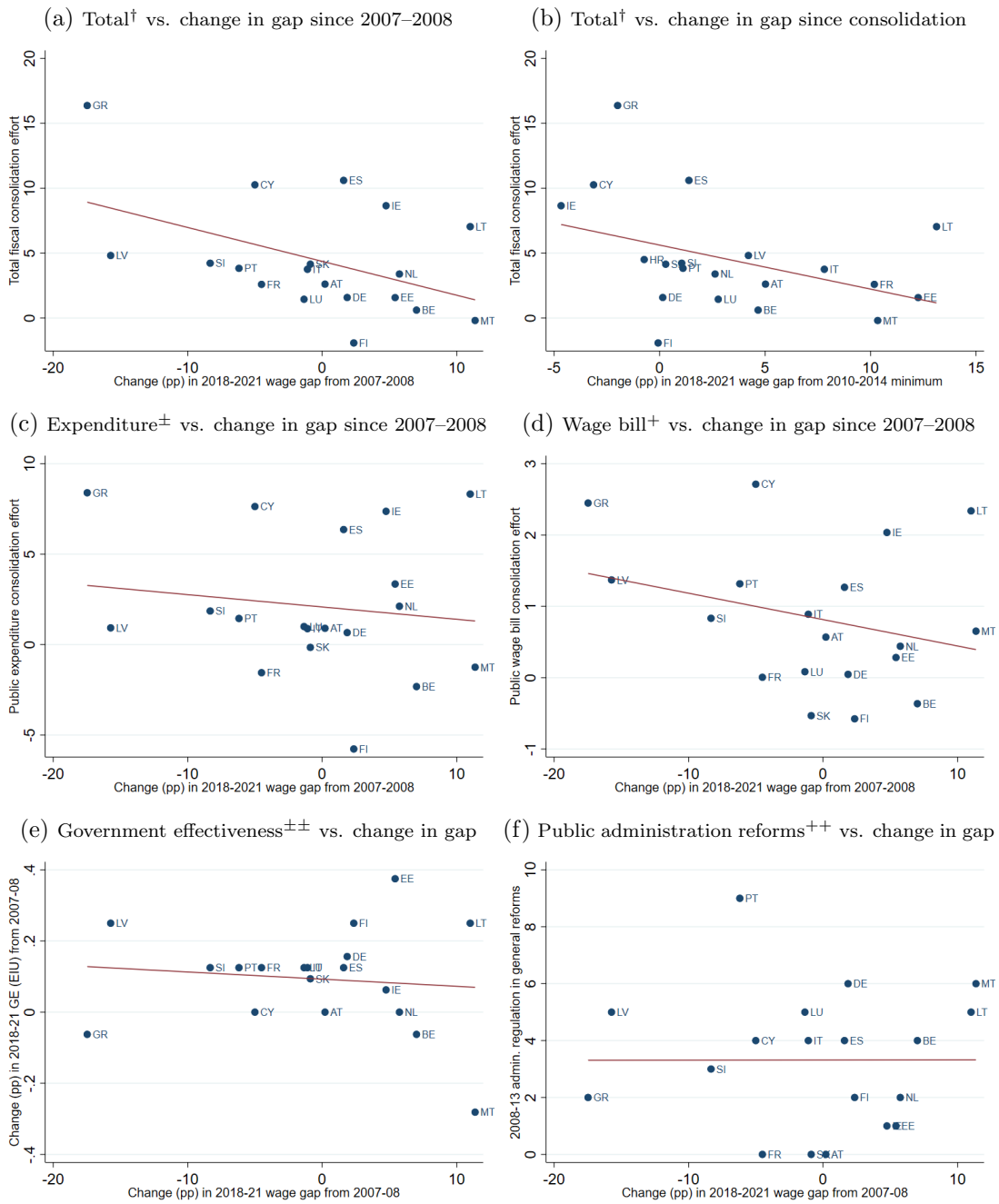
Starting with the block of reforms (panels 6e and 6f), the scatterplots show no relationship between the change in the public–private sector wage gap over the whole sample and, on the one hand, measures taken to improve the efficiency of the government over the reference period, or on the other, public administration reforms taken during 2008–2013. The estimated gaps display significant heterogeneity that is not connected with improvements in government efficiency or a stronger reformist effort. These results are robust to the use of alternative indicators from the European Commission’s MICREF database.

In contrast, the evolution of the public–private pay gap is negatively correlated with the extent of the fiscal consolidation implemented during the episode under consideration, when looking both at the change over the whole sample period (from 2007–2008 to 2018–2021) (Figure 6a) and at the evolution since the fiscal consolidation episode (minimum over 2010–2014) (Figure 6b). This means that stronger fiscal austerity packages are

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<sup>8</sup>The index is provided by the Economist Intelligence Unit Riskwire & Democracy Index (referred to as the EIU) and takes into account the quality of bureaucracy, institutional effectiveness, excessive bureaucracy and red tape. A similar indicator, the Political Risk Services International Country Risk Guide (referred to as the PRS), which defines government effectiveness in terms of bureaucratic quality, showed similar dynamics.

Figure 6: Fiscal consolidation effort<sup>‡</sup> and reforms, and the evolution of the wage gap



Notes:

<sup>‡</sup>: The structural components of the fiscal items are computed using the methodology of [Kremer et al. \(2006\)](#), which lays out a standardised framework that distinguishes between the effects of discretionary fiscal policy and other developments determining a structural fiscal position.

<sup>†</sup> Total fiscal consolidation effort: cumulative change in government structural primary balance over 2010–2014.

<sup>±</sup> Expenditure consolidation effort: cumulative change in government structural primary expenditure over 2010–2014.

<sup>+</sup> Wage bill consolidation effort: cumulative change in government compensation of employees over 2010–2014.

<sup>±±</sup> Government effectiveness: Economist Intelligence Unit Riskwire & Democracy Index, which considers the quality of bureaucracy, institutional effectiveness, excessive bureaucracy and red tape.

<sup>++</sup> Public administration reforms: number of reforms under the category ‘administrative regulation in general’, from the European Commission’s database on microeconomic reforms (MICREF).



associated with a more permanent reduction in the pay gap for countries that reduced it, or a more muted increase for countries that experienced a positive evolution of the gap (over the sample periods considered in our study).

Interestingly, the slope of the regression line is steeper in these cases than when we correlate the wage premium with the size of the fiscal consolidation effort attributable to the adjustment of public expenditure (Figure 6c), with a regression line that is almost flat. Within expenditure, however, we also find a negative correlation between the evolution of the wage gap and the size of fiscal consolidation via the public compensation of employees (Figure 6d).

### 3.3 The public–private wage gap and the structure of the economy

When using the public–private wage gap as a policy target when designing fiscal consolidation from a cross-country point of view (see discussion in Section 1), it must be taken into account that the observed heterogeneity in the pay gap is not only the result of active policy decisions (i.e. on the status of public employees or on the policy to attract and retain workers in the government). The size of the public–private wage premium also depends on the structure of the economy, at least along two related dimensions: its sectoral composition and its exposure to international competition.

As regards the first issue, countries with a higher (lower) share of the industrial sector<sup>9</sup> tend to have a lower (higher) wage gap, as shown in Figure 7a (see also Table B.2). This is also exemplified in Figure 7b, where we present a counterfactual scenario in which we calculate the hypothetical public–private wage gap that would result if all countries had the same sectoral composition of the economy, taking Germany as reference. More specifically, we apply to all countries the sectoral employment weights of Germany. According to this counterfactual exercise, the wage gaps would be around 5pp lower in the hypothetical Spanish and Italian economies.

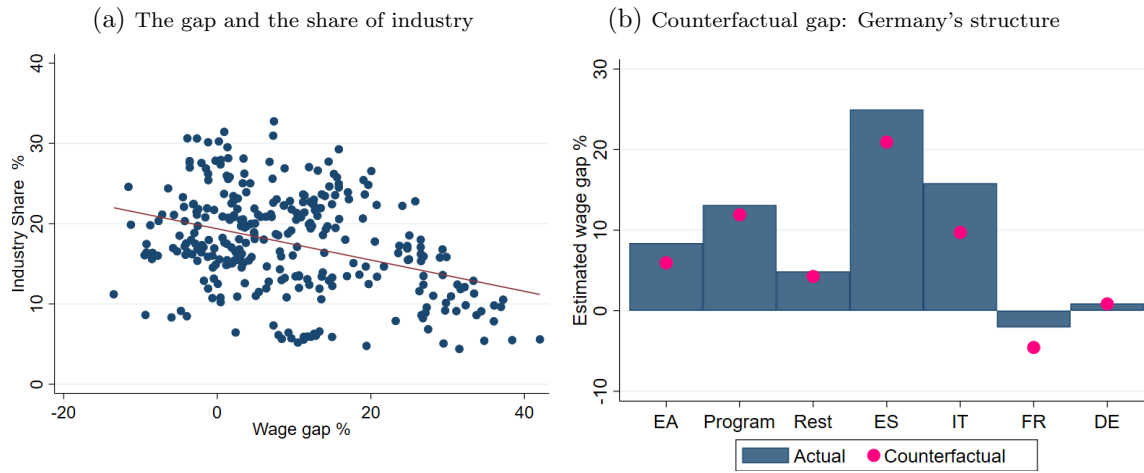
As regards the second issue, the distinction between sectors that produce tradable versus non-tradable goods/services<sup>10</sup> may be instrumental in understanding the public pay gap. The main theoretical reference in this regard is the Scandinavian model of inflation (Lindquist and Vilhelmsson, 2006), where the traded goods sector exerts a ‘leadership’ or ‘signalling’ role that can have an influence on public sector wages. The Scandinavian model seems to operate broadly, as public–private wage gaps are reduced when public

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<sup>9</sup>Industry is defined as activity in the following sectors of the NACE classification: B (Mining and Quarrying), C (Manufacturing), D (Electricity, Gas, Steam and Air Conditioning Supply) and E (Water Supply; Sewerage, Waste Management, and Remediation Activities).

<sup>10</sup>Tradable: aggregation of NACE classification sectors A (Agriculture, Forestry and Fishing), B (Mining and Quarrying), C (Manufacturing), D (Electricity, Gas, Steam and Air Conditioning Supply) and E (Water Supply; Sewerage, Waste Management and Remediation Activities) sectors of the NACE classification. Non-tradable: aggregation of NACE classification sectors F (Construction), G to N, and R to U (Market Services).

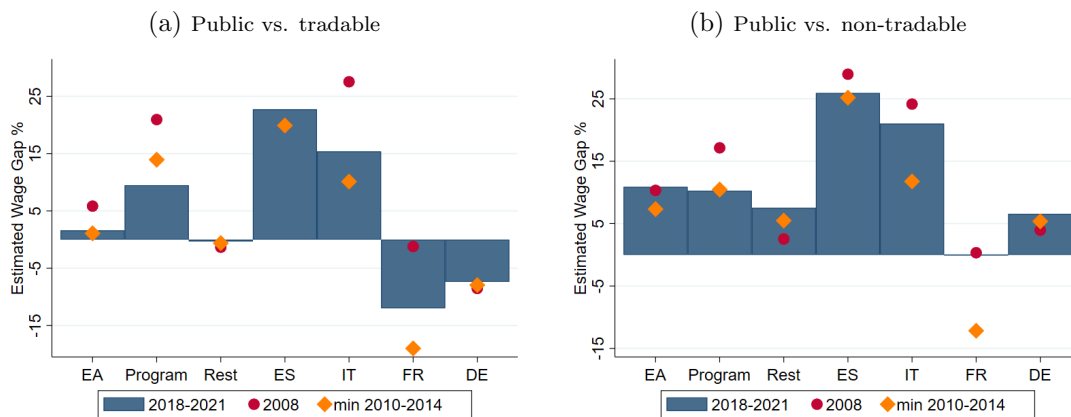
Figure 7: The public-private wage gap and the structure of the economy



Notes: Panel (a) shows wage gaps (pairs of all years and all countries) versus the shares of individuals whose economic activity for their main job is industry, by country. Industry is defined as activity in the following sectors of the NACE classification: B (Mining and Quarrying), C (Manufacturing), D (Electricity, Gas, Steam and Air Conditioning Supply) and E (Water Supply; Sewerage, Waste Management, and Remediation Activities). Panel (b) displays the wage gap for 2021: the actual wage gap (represented by blue bars) is the same as in Figure 4; the counterfactual scenario (represented by circles) is that which would result if all countries had the same sectoral composition of the economy as Germany, i.e. the same sectoral employment weight. Programme countries: Ireland, Portugal, Greece and Cyprus. Other countries: the Netherlands, Belgium, Austria, Finland, Slovakia, Luxembourg, Croatia, Lithuania, Slovenia, Latvia, Estonia and Malta.

wages are compared to wages in the tradable sectors, instead of those in the overall private sector delimitation used in our baseline estimation (Figure 8). As expected, exposure to international competition induces a negative correlation with the wage gap, as foreign competition can help increase efficiency and discipline the process of setting wages in the economy.

Figure 8: Wage gap between public and private tradable/non-tradable sectors



Notes: Panel (a) shows the wage gap between the public sector and the aggregation of the A (Agriculture, Forestry and Fishing), B (Mining and Quarrying), C (Manufacturing), D (Electricity, Gas, Steam and Air Conditioning Supply) and E (Water Supply; Sewerage, Waste Management and Remediation Activities) sectors of the NACE classification. Panel (b) shows the wage gap between the public sector and the aggregation of the sectors of the NACE classification not considered in panel (a): F (Construction) and G to N, plus R to U (Market Services). Programme countries: Ireland, Portugal, Greece and Cyprus. Other countries: the Netherlands, Belgium, Austria, Finland, Slovakia, Luxembourg, Croatia, Lithuania, Slovenia, Latvia, Estonia and Malta.

## 4 Concluding remarks

The most recent fiscal adjustment episode in the euro area occurred during the so-called euro area sovereign debt crisis (2010–2014). It affected many countries and relied quite significantly on the public wage bill. The austerity measures contributed, in particular, to an immediate partial correction of positive public–private pay differentials, most notably in countries subject to the EU’s financial assistance programmes.

An important aspect of the debate on public wage bill restraint concerns how long such policies can be sustained over time, i.e. whether the downward corrections that were initially observed in many countries were permanent or ended up being transitory and were reversed in subsequent years. To assess what happened in the euro area, we estimate the wage differential controlling for observable differences between individuals using cross-sectional microdata from a harmonized survey, the European Union Statistics on Income and Living Conditions, for euro area countries over the 2007–2021 period.

We show that the lower wage premiums reverted only partially to pre-fiscal consolidation levels over the subsequent decade and that more sustained policy achievements are linked to larger fiscal adjustment efforts during the 2010–2014 crisis.

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# Appendix

## A Sample size

Table A.1: Sample size over time

Year	Total	Private	%	Public	%
	Sample	Sample		Sample	
2007	104,557,349	75,233,011	71.95	29,324,338	28.05
2008	109,873,810	84,688,102	77.08	25,185,709	22.92
2009	107,348,336	76,698,911	71.45	30,649,424	28.55
2010	108,015,309	76,316,077	70.65	31,699,232	29.35
2011	107,851,169	76,020,907	70.49	31,830,262	29.51
2012	108,113,507	76,710,110	70.95	31,403,396	29.05
2013	106,603,683	74,477,229	69.86	32,126,454	30.14
2014	107,705,405	75,164,250	69.79	32,541,155	30.21
2015	108,978,709	75,635,567	69.40	33,343,142	30.60
2016	109,581,392	75,746,949	69.12	33,834,443	30.88
2017	112,674,289	77,857,701	69.10	34,816,588	30.90
2018	114,756,278	79,578,431	69.35	35,177,846	30.65
2019	116,938,659	81,731,060	69.89	35,207,599	30.11
2020	108,933,728	76,415,545	70.15	32,518,183	29.85
2021	109,064,146	76,288,868	69.95	32,775,278	30.05
Total	1,640,995,768	1,158,562,719	70.60	482,433,049	29.40

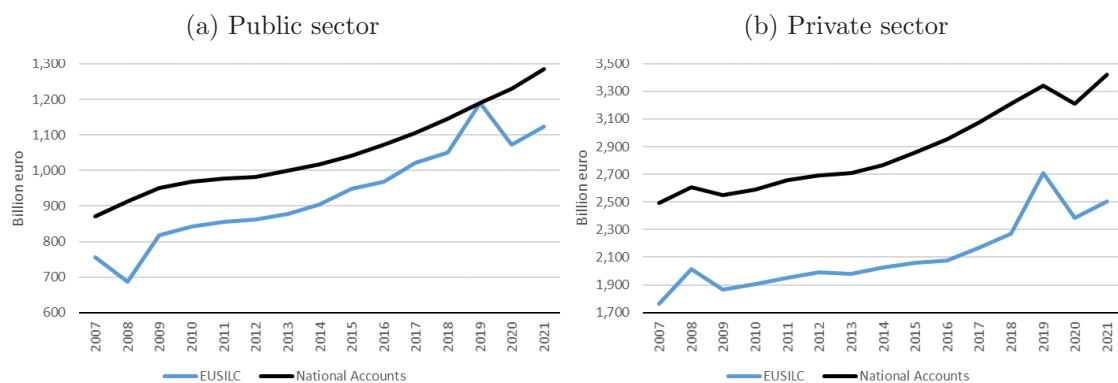
Notes: This table reports the public and private sector sample sizes used in the micro analysis by year, pooling countries. The public sector refers to the aggregation of the *O* (Public Administration and Defense, Compulsory Social Security), *P* (Education) and *Q* (Health and Social Work) sectors of the NACE classification.

Table A.2: Sample size by country

Country	2007–2021		2010		2014		2019		2021	
	Obs	%	Obs	%	Obs	%	Sample	%	Obs	%
AT	3,085,068	2.82	2,977,998	2.76	3,122,129	2.9	3,316,973	2.84	3,079,011	2.82
BE	3,666,844	3.35	3,542,929	3.28	3,684,652	3.42	3,894,821	3.33	3,971,991	3.64
CY	322,238	0.29	314,196	0.29	302,879	0.28	360,462	0.31	371,156	0.34
DE	32,538,429	29.74	32,432,903	30.03	32,345,970	30.03	35,522,728	30.38	29,742,798	27.27
EE	535,048	0.49	496,606	0.46	506,964	0.47	561,164	0.48	507,249	0.47
ES	14,041,202	12.83	14,123,659	13.08	13,012,334	12.08	15,043,312	12.86	15,273,771	14
FI	1,075,064	0.98	1,047,712	0.97	1,051,442	0.98	1,110,798	0.95	1,113,602	1.02
FR	21,608,705	19.75	21,250,354	19.67	21,832,800	20.27	22,210,922	18.99	20,158,718	18.48
GR	2,492,949	2.28	2,865,238	2.65	2,124,273	1.97	2,573,705	2.2	2,639,715	2.42
HR	994,243	0.91	1,189,842	1.1	1,211,198	1.12	1,336,160	1.14	1,310,068	1.2
IE	1,459,200	1.33	1,200,898	1.11	1,359,438	1.26	1,693,077	1.45	1,763,976	1.62
IT	16,389,507	14.98	15,916,760	14.74	16,420,345	15.25	17,429,189	14.9	17,363,686	15.92
LT	1,113,876	1.02	1,056,225	0.98	1,093,182	1.01	1,083,779	0.93	1,107,302	1.02
LU	206,189	0.19	192,275	0.18	200,828	0.19	230,636	0.2	225,591	0.21
LV	727,989	0.67	666,431	0.62	716,030	0.66	708,352	0.61	687,024	0.63
MT	157,264	0.14	131,226	0.12	147,011	0.14	196,431	0.17	206,650	0.19
NL	3,103,453	2.84	2,972,567	2.75	3,029,949	2.81	3,320,845	2.84	3,364,182	3.08
PT	3,515,618	3.21	3,253,090	3.01	3,299,973	3.06	3,903,705	3.34	3,767,044	3.45
SI	326,231	0.3	315,167	0.29	315,190	0.29	361,857	0.31	367,261	0.34
SK	2,040,601	1.87	2,069,233	1.92	1,928,818	1.79	2,079,743	1.78	2,043,349	1.87
Total	109,399,718	100	108,015,309	100	107,705,405	100	116,938,659	100	109,064,14	100

Note: This table reports the sample sizes used in the micro analysis by country.

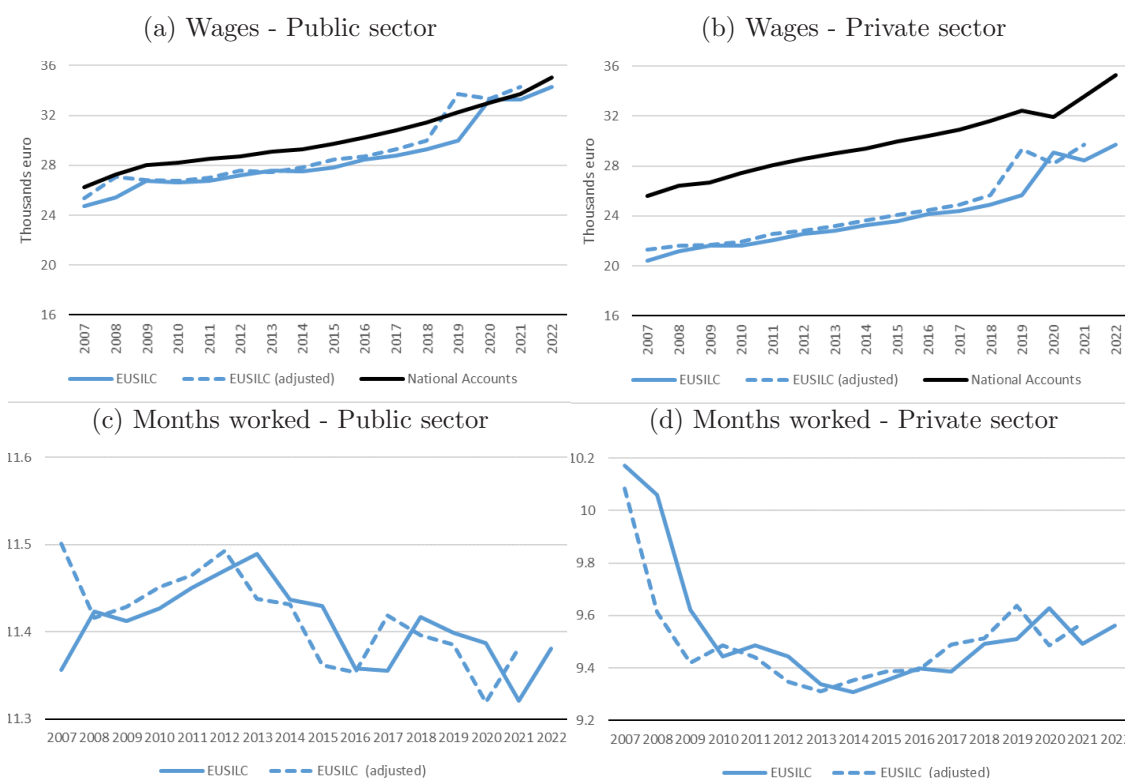
Figure A.1: Wage bill sample coverage



Notes: Aggregate data for the euro area. Public sector refers to the aggregation of the *O* (Public Administration and Defense, Compulsory Social Security), *P* (Education) and *Q* (Health and Social Work) sectors of the NACE classification.

## B Constructing the variables

Figure B.1: Adjusting micro variables to construct hourly wages



Notes: Aggregate data for the euro area. Public sector refers to the aggregation of the *O* (Public Administration and Defense, Compulsory Social Security), *P* (Education) and *Q* (Health and Social Work) sectors of the NACE classification. Wage data from the National Accounts refer to the ratio of wages to the number of employees, and data from the EU-SILC survey refer to the gross salary income. EU-SILC wages and months worked are synchronised using the growth rate of their respective averages, calculated by country and public or private sector.



Table B.1: Descriptive statistics

	Total		Public		Private	
	Mean	Std. dev	Mean	Std. dev	Mean	Std. dev
Hourly wage (euro)	14.52	(1.11)	15.79	(1.80)	14.00	(1.37)
Demeaned experience (years)	-4.92	(1.53)	-3.90	(2.71)	-5.34	(1.85)
Low education (%)	67.13	(0.06)	52.37	(0.12)	73.27	(0.07)
Manager (%)	25.75	(0.06)	25.78	(0.10)	25.74	(0.07)
Marital status (%)	53.36	(0.07)	55.51	(0.12)	52.46	(0.08)
Female (%)	47.60	(0.07)	65.67	(0.11)	40.07	(0.08)
Part-time (%)	18.87	(0.05)	23.47	(0.10)	16.95	(0.06)

Notes: This table reports descriptive statistics for the variables used to estimate the public–private wage gap. We use the whole sample to demean experience.

Table B.2: Sectoral structure in 2021 (%)

Country	a	b-e	f	g	h	i	j	k	l-n	o	p	q	r-u
AT	0.98	17.24	8.41	13.99	4.58	4.15	3.49	3.68	10.83	9.69	7.71	11.70	3.55
BE	0.40	15.54	4.98	9.88	5.00	1.77	3.67	3.25	10.24	10.50	13.22	17.25	4.30
CY	0.76	7.88	9.19	18.78	3.39	7.39	3.21	5.42	11.85	10.02	9.47	4.84	7.80
DE	0.77	23.75	5.98	12.06	4.98	2.12	3.87	3.18	9.12	9.63	6.38	13.57	4.60
EE	2.34	20.47	8.35	13.08	7.54	2.82	5.49	1.87	8.07	6.85	11.91	6.88	4.33
ES	2.83	15.57	5.97	13.14	5.37	5.87	3.89	2.76	9.83	8.27	9.54	10.72	6.22
FI	1.11	15.20	6.38	11.19	5.99	2.57	5.41	2.03	12.05	7.33	8.84	16.00	5.90
FR	0.99	17.22	6.72	11.62	5.64	2.65	4.25	4.15	9.05	10.05	10.00	14.36	3.30
GR	1.85	11.93	4.37	17.83	5.02	9.62	3.09	3.07	7.02	15.62	9.59	8.01	2.98
HR	2.58	21.61	7.09	14.64	5.96	4.65	3.34	2.75	8.91	8.07	8.39	7.32	4.70
IE	0.93	15.11	5.01	11.42	3.80	4.59	6.49	5.34	11.51	6.14	10.85	15.40	3.43
IT	3.35	24.95	5.77	11.49	5.42	4.91	2.97	2.89	8.00	6.52	9.37	8.08	6.27
LT	2.21	18.87	6.97	16.02	7.63	2.00	2.92	2.38	8.78	9.37	12.08	7.75	3.03
LU	0.46	4.44	7.62	7.65	4.62	4.26	3.52	10.24	13.95	21.89	1.49	9.60	10.25
LV	4.74	16.40	6.87	15.13	8.04	2.43	3.97	2.46	9.39	9.52	10.50	7.33	3.22
MT	0.18	12.46	4.39	12.86	5.40	5.28	2.89	5.95	11.29	12.84	10.89	9.85	5.73
NL	1.08	9.59	3.48	12.75	5.15	2.26	4.89	3.88	14.81	9.91	8.83	20.16	3.22
PT	1.66	20.72	6.30	13.55	4.29	4.87	3.88	2.89	8.37	8.18	10.29	10.82	4.18
SI	0.61	26.80	4.42	12.94	4.85	2.93	4.13	2.45	9.92	7.84	11.71	8.46	2.91
SK	2.44	30.29	6.53	11.72	6.90	3.70	2.70	2.30	5.16	10.83	8.16	6.76	2.51

Notes: This table reports the sectoral structure of employment according to our EU-SILC sample by country in 2021. Sectors of the NACE classification are used. Individuals who do not report the sector of economic activity for their main job are removed from the sample, France being the most affected country (about 4% of the sample).

## C Estimated wage gap

Table C.1: Estimated wage gap by country for the whole period and selected years

Country	2007–2021		2010	2014	2019	2021
	total difference	wage gap	wage gap	wage gap	wage gap	wage gap
EA	17.97	8.82 *** (0.19)	7.92 *** (0.78)	7.45 *** (0.71)	8.13 *** (0.79)	8.39 *** (0.62)
AT	19.48	9.36 *** (0.75)	14.35 *** (3.12)	7.93 *** (2.51)	9.63 *** (2.26)	10.39 *** (2.76)
BE	7.69	2.04 *** (0.46)	0.92 (1.33)	0.27 (1.21)	4.12 *** (1.54)	2.96 ** (1.49)
CY	50.43	35.92 *** (1.92)	32.21 *** (2.2)	31.13 *** (2.24)	32.34 *** (2.33)	23.23 *** (2.29)
DE	7.42	2.66 *** (0.41)	2.09 (1.68)	3.07 * (1.62)	2.16 (1.69)	0.89 (0.99)
EE	5.33	-5.02 ** (2.01)	-2.47 (2.6)	2.63 (2.83)	6.34 ** (3.06)	-7.64 * (4.18)
ES	40.66	26.84 *** (0.57)	26.49 *** (2.05)	26.51 *** (2.02)	24.82 *** (2.61)	24.97 *** (1.99)
FI	8.67	2.56 ** (1.08)	-0.63 (1.83)	3.46 (2.19)	3.20 (2.01)	-4.73 * (2.81)
FR	-4.03	-4.77 *** (0.4)	-8.50 *** (1.7)	-3.96 ** (1.59)	-1.99 (1.47)	-2.08 (1.34)
GR	49.37	31.16 *** (3.25)	10.63 *** (2.75)	16.89 *** (1.71)	9.03 *** (1.19)	6.38 *** (1.25)
HR	18.62	10.08 *** (0.57)	19.21 *** (2.3)	7.73 *** (2.04)	2.68 (1.69)	5.31 *** (1.69)
IE	27.32	16.28 *** (0.94)	26.32 *** (3.28)	20.80 *** (2.98)	10.19 *** (2.78)	17.73 *** (3.74)
IT	29.74	18.65 *** (0.45)	15.59 *** (1.55)	14.02 *** (1.54)	19.67 *** (1.74)	15.82 *** (2.75)
LT	20.01	4.74 *** (1.25)	18.96 *** (4.48)	-5.63 * (3.05)	3.93 (3.1)	7.63 ** (3.45)
LU	27.96	27.88 *** (1.66)	33.44 *** (2.14)	36.01 *** (1.82)	42.01 *** (2.31)	31.52 *** (2.48)
LV	13.97	4.17 *** (1.06)	-2.58 (3.34)	-1.10 (2.47)	-4.04 (2.68)	-9.22 *** (2.28)
MT	17.58	6.62 *** (0.53)	15.40 *** (2.6)	9.83 *** (1.68)	3.59 * (1.85)	11.98 *** (2.27)
NL	13.68	12.50 *** (9.5)	9.27 *** (1.95)	7.97 *** (2.45)	11.22 *** (1.5)	10.49 *** (1.6)
PT	34.61	16.57 *** (0.64)	12.73 *** (2.65)	13.04 *** (2.04)	4.84 *** (1.74)	15.87 *** (2.03)
SI	39.53	19.87 *** (2.15)	14.50 *** (2.49)	0.43 (2.51)	-3.60 (2.82)	1.62 (2.58)
SK	5.73	0.95 (0.88)	3.32 ** (1.6)	-1.19 (1.63)	0.91 (1.44)	-1.19 (2.34)

Notes: Results of the Oaxaca–Blinder decomposition estimation: unexplained wage gap. Level of significance: \* 10%, \*\* 5%, \*\*\* 1%. Standard errors in parentheses.

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