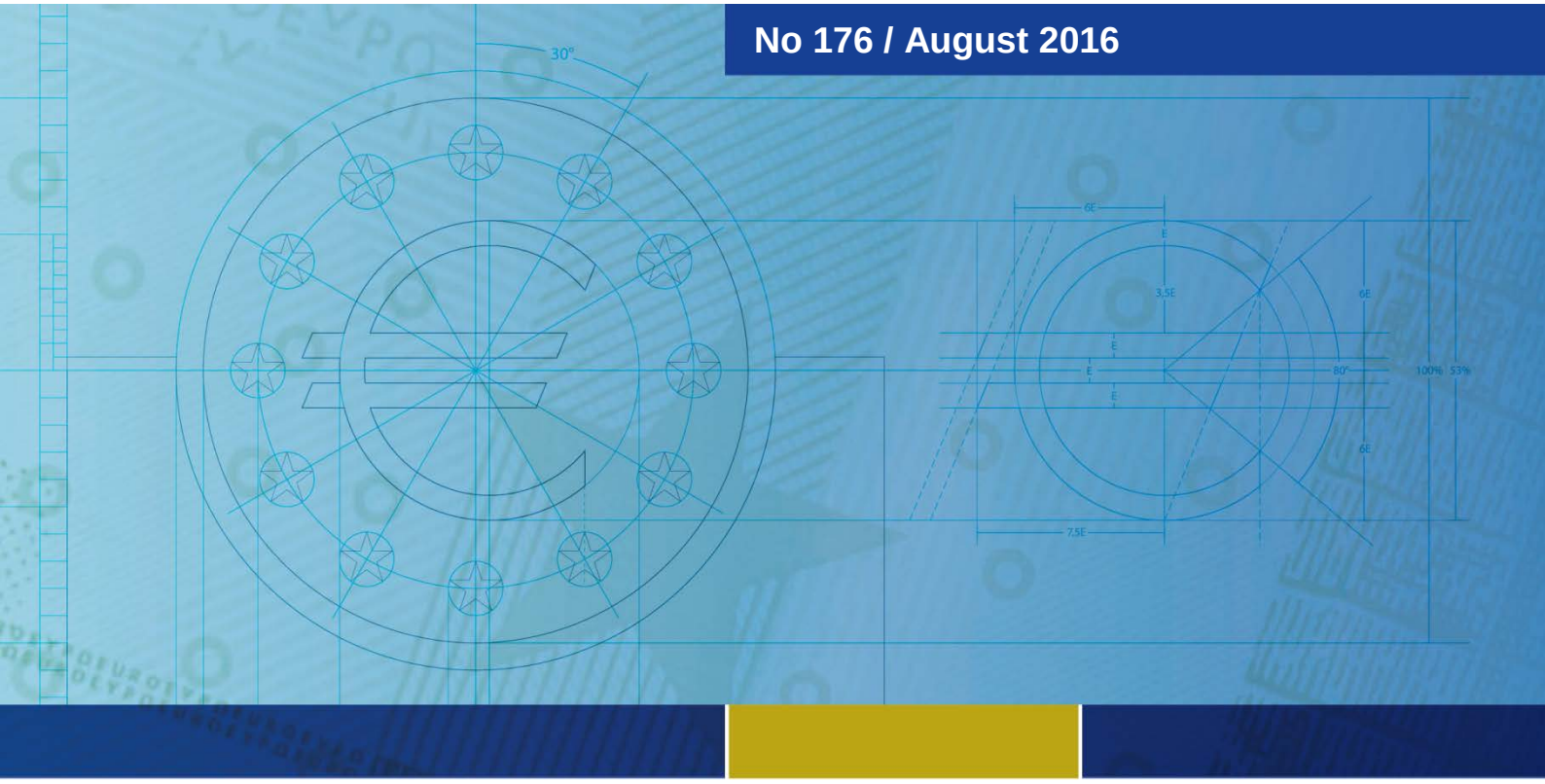
EUROPEAN CENTRAL BANK

EUROSYSTEM

# Occasional Paper Series

Javier J. Pérez, Marie Aouriri,
Maria M. Campos, Dmitrij Celov,
Domenico Depalo, Evangelia Papapetrou,
Jurga Pesliakaitė, Roberto Ramos,
Marta Rodríguez-Vives

## The fiscal and macroeconomic effects of government wages and employment reform



No 176 / August 2016

# Contents


**Abstract** 2

**Non-technical summary** 3

**1 Introduction** 5

**2 The role of the government wage bill in the recent fiscal consolidation episode** 7

2.1 Euro area aggregate trends 7

2.2 Cross-country heterogeneity in the evolution of the public wage bill 10

2.3 The heterogeneity of policy responses 13

2.4 The wage bill adjustment: temporary or permanent? 17

2.5 The supporting role of fiscal-structural policies 20

**3 The macroeconomic effects of public wage bill reform** 21

3.1 An overview 21

3.2 The competitiveness channel 23

3.3 The efficiency channel 27

**4 Policy discussion** 30

**References** 31

**Appendix I Definitions and data used** 35

**Appendix II Deepening the understanding of public-private pay differentials** 38

**Appendix IIIa Policy measures implemented during the crisis with a direct impact on the general government sector wage bill** 40

**Appendix IIIb Significant structural policy actions with a direct impact on the general government sector wage bill implemented by EU countries** 44

# Abstract

This paper examines the overall macroeconomic impact arising from reform in government wages and employment, at times of fiscal consolidation. Reform of these two components of the government wage bill appeared necessary for containing the deterioration of the public finances in several EU countries, as a consequence of the financial crisis. Such reforms entailed in some instances, but not always, the implementation of cost-cutting measures affecting the government wage bill, as part of broader consolidation packages that typically hinged more heavily on other fiscal instruments, like public investment. While such measures have adverse short-term macroeconomic effects, public wage bill restraining policy changes present the idiosyncrasy that they can yield medium- to longer-term benefits due to possible competitiveness and efficiency gains through their impact on labour market dynamics. This paper provides some evidence of such medium- to long-run effects, based on a wealth of micro and macro data in the euro area and the EU. It concludes that appropriately designed government wage bill moderation could indeed produce positive dividends to the economy, which depend on certain country-specific conditions. These gains can be reinforced by relevant fiscal-structural reforms.

**Keywords:** public employment, public wages, labour market, fiscal policies, fiscal consolidation.

**JEL codes:** H50, E62, J45.

# Non-technical summary

The government wage bill can be broken down into two elements: government employment and compensation per government employee (wages). In the euro area, the government wage bill accounts for almost a quarter of total government expenditure and around 10% of GDP, hence its relevance from a macroeconomic standpoint. Restraint of the government wage bill played a role in the recent fiscal consolidation episode, with actions on this front being part of broader policy packages that typically hinged more heavily on other fiscal instruments, like public investment. These policy measures have to be assessed against the significant episode of stress that affected the public budgets of a number of EU countries during the sovereign crisis period.

Changes to the government wage bill need to be assessed in comparison with developments in the private sector. Regarding wages, the growth per government employee was higher compared to the private sector in the initial phase of the crisis (2007-2010), as the latter was hit more immediately by the economic recession. The cumulative excess was then mostly reversed over 2010-2014 by public wage-containment policies, including wage freezes, but also nominal reductions in salaries and benefits in some cases. There was substantial heterogeneity across EU countries in the evolution of public wages and employment.

The recent cost-cutting public wage bill measures were mainly driven by fiscal consolidation requirements. It has been argued that these adjustments may have entailed costs in terms of output losses and higher unemployment. However, such adverse macroeconomic effects are largely felt, if anything, in the short run.

Notwithstanding the direct adverse short-term macroeconomic effects, there are benefits from government wage bill reform that go beyond the objective of fiscal consolidation. Under certain macroeconomic and institutional conditions, a rationalisation of government wages and employment policies can generate favourable labour market effects in the medium to longer term through competitiveness and efficiency gains. Competitiveness gains materialise through the spillovers effects of public wage moderation on the determination of private sector wages. There is scope for public wage adjustments in the case of positive differentials compared to private wages, which go beyond what could be explained by differences in workers' characteristics, such as the level of education. Efficiency gains from public employment reform arise when public sector activity partially competes with the private sector (in the production of individual, non-collective public goods, like in the education or health sectors). A decrease in public hours worked to produce substitutable products can lead to the private sector crowding-out public jobs. Nevertheless, when public sector activity complements private sector productivity (through the provision of collective goods, like the judicial system), such policies would only affect positively private employment if targetted to increasing the efficient provision of such public goods.

An important aspect of the debate on public wage bill restraint concerns how long such policies can be sustained over time. In countries where fiscal consolidation needs are still high, recent government wage bill savings would need to be preserved. Additional margins of short-term adjustment include the moderation of still high public-to-private wages gaps, or a possible continuation of the downsizing trend in public employment, depending on the country-specific situation. In any case, as regards restraint of real public wages, historical experience shows that catching-up processes in good economic times tend to partially or completely offset crisis-related budgetary savings. As regards falls in public employment, a significant portion of the savings observed during the consolidation period hinged on workers with temporary contracts. Thus, the employment adjustment was more of a cyclical-like reaction than a permanent reduction, a fact which is emphasised in this paper.

Finally, the paper argues that reforms affecting public sector personnel are most effective and have more sustained effects when the measures implemented are of a structural nature, beyond those aimed at immediate public deficit reduction, such as the ones resulting from broad-based ongoing public spending reviews in several EU countries. Structural measures impinge on government efficiency and thus on overall economy productivity. Some examples are human management/pay reforms, improvements in wage bargaining mechanisms within the government sector, or measures to streamline the size and scope of government.

# 1 Introduction

Government wages and employment are the two components of the so-called "government wage bill", which accounts for almost a quarter of total public spending in the EU. Public wage expenditure also plays an important role in aggregate demand, as the government wage bill accounts for around 10% of GDP.[1] These figures reflect the importance of the government as an employer: around 20% of the labour force in the EU is employed in the government sector. Thus, the public wage bill is an important consolidation instrument when fiscal rebalancing is needed. In fact, empirical evidence shows that reductions in the public wage bill are robustly associated with the success of fiscal consolidation episodes. Over the recent period of fiscal retrenchment (2010-2014) the adjustment of the euro area aggregate government wage bill accounted for 10% of the improvement in the structural general government balance-to-GDP ratio. In any case, there was a large cross-country heterogeneity of policy responses regarding government wage bill reductions. Moreover, many governments opted for consolidating strongly through other fiscal instruments, with a particular recourse to cuts in public investment.

It is widely acknowledged in the literature that fiscal adjustment tends to generate direct adverse short-term economic impacts. In the particular case of the public sector wage bill, though, these tend to be milder compared to other fiscal instruments.[2] This is so because the short-term negative impact is mitigated by indirect favourable labour market effects in the medium-term. Public wage moderation impinges on the overall cost-competitiveness of the economy through linkages with private sector wage setting[3], in particular when positive public-private wage gaps[4] are reduced. Moreover, targeted adjustment of public employment may spur private employment.[5]

Sustained containment of the public wage bill is more likely to be achieved and maintained by countries that adopt a wide range of structural reforms beyond measures aimed at immediate public deficit reduction.[6] Structural measures impinge on government efficiency and thus on overall economy productivity. Some examples are human management/pay reforms, improvements in wage bargaining mechanisms within the government sector, or measures to streamline the size and scope of government. However, a careful analysis of public sector performance and

1 On data sources and definitions see Appendix I. The cut-off date for information included in this paper was October 2015.

2 See for instance Alesina et al. (2002) and Hernández de Cos and Moral-Benito (2016).

3 See for instance Alesina et al. (2002), Afonso and Gomes (2008), Lamo, Pérez and Schuknecht (2012), Marzinotto and Turrini (2016) or Holm-Hadulla, et al. (2010).

4 See, among others, Campos et al. (2015).

5 See for example Stepanyan and Leigh (2015), Algan et al. (2002), Lamo, Moral-Benito and Pérez (2016).

6 See for instance IMF (2015) and Forni and Novta (2015).

efficiency is warranted since some empirical evidence shows that public spending on health and education positively impact economic growth.[7]

This paper reviews and provides evidence on these interrelated issues. The main contribution is the comprehensive set of micro and macro data used to support the analyses (see appendixes I, II and III).

Section 2 provides stylised facts on the role public wages and employment policies played during the most recent consolidation period in the euro area and the EU. It also discusses the supporting role of fiscal-structural policies when governments adopt consolidation measures through their wage bill. Section 3 analyses the possible channels of transmission of government wage bill policies into the economy. Section 4 sets out conclusions and provides key policy messages.

[7] Afonso and González-Alegre (2011). It must be noted that around two thirds of government wage spending in the euro area takes place in these two areas of government.

# 2 The role of the government wage bill in the recent fiscal consolidation episode

This section describes the recent developments of the public wage bill from an aggregate perspective. This includes comparisons with medium-term trends (since the early 1980s), with private sector developments, and with alternative fiscal consolidation instruments. Section 2.1 focuses on the euro area as a whole, given the availability of historical aggregates. Section 2.2 turns to individual country data, as the evolution of public wages and employment shows a significant heterogeneity across countries.

## 2.1 Euro area aggregate trends

Until the beginning of the crisis (**Chart 1**), the aggregate euro area public wage bill as a fraction of GDP had been on a declining trend since the early 1980s. This trend had closed the historical gap with the US ratio by the beginning of the 2000s. The declining trend was only halted with the onset of the crisis, not only because of the fall in GDP (the denominator) but also because of positive year-on-year real growth rates of government wage bill spending up until 2010. The latter is to a large extent due to the generalised implementation of fiscal stimulus plans in the EU at the beginning of the crisis, under the umbrella of the so-called European Economic Recovery Plan (see Bouthevillain et al., 2009). In fact, fiscal austerity plans started to affect the government sector wage bill from an aggregate point of view only as of 2010.

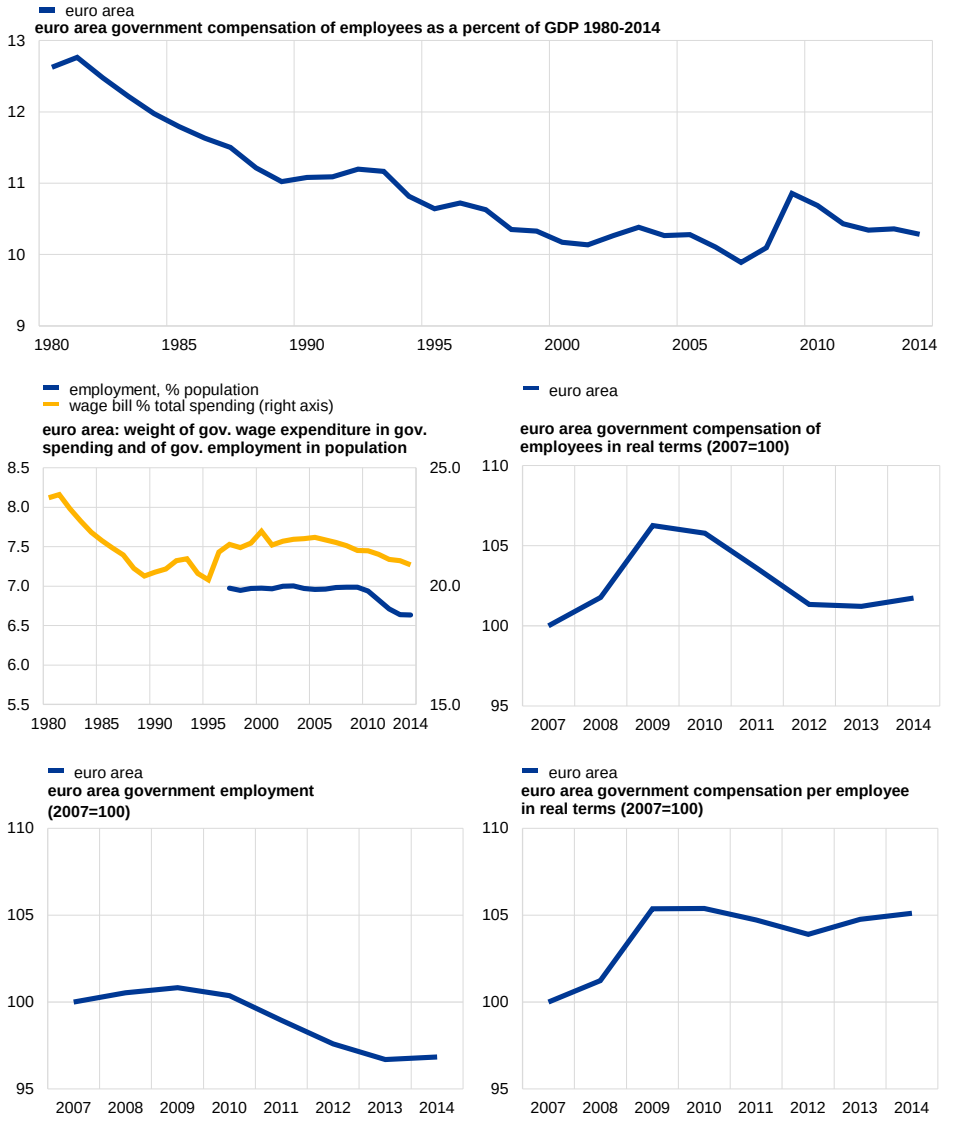
Between 2010 and 2014, there was a partial correction of the increase in the initial phase of the crisis. In particular, euro area aggregate government wage expenditure fell in 2010-2012 in real terms and, as a consequence, the cumulative real increase between 2007 and 2014 was contained to slightly below 2%. In turn, as a percent of total public spending, government wage expenditure continued on the pre-crisis declining trend, while public employment fell as a percentage of the population after remaining broadly stable during the previous decade. From an aggregate perspective, the change in 2010 in government wage bill dynamics was mainly due to the decline in public employment. While over 2007-2010 real public wages per employee and public employment grew by 5.3% and 0.4%, respectively, between 2010 and 2014 employment fell and public wages were kept broadly constant in real terms. Thus, overall, between 2007 and 2014 public employment dropped by 3.2%, while public wages increased by more than 5% in real terms.

Compared to the private sector, euro area aggregate public wage dynamics over 2007-2014 were more expansionary while public employment losses were larger in percentage terms (**Chart 2**). Indeed, between 2007 and 2014 the wage bill in both the public and private sectors evolved in a broadly similar way, in cumulative terms, but the evolution of its two components – employment and wages – was quite

different. Real wages grew more strongly in the public than in the private sector until 2010 (5.3% vs. 2.4%, in cumulative terms). However, since 2010 real public wages recorded a slight loss of below 0.5% compared to an increase of some 2% in the private sector. Overall, aggregate data show that the euro area government wage differential with respect to the private sector increased from 20% in 2007 to 25% in 2009, and subsequently fell to 23% in 2014 owing to fiscal consolidation measures (**Chart 2**, lower panel). From a medium-term perspective, these measures halted the upward trend in relative public-to-private wages witnessed since the beginning of the 1990s (when the gap was smallest, at just over 5%).

**Chart 1**

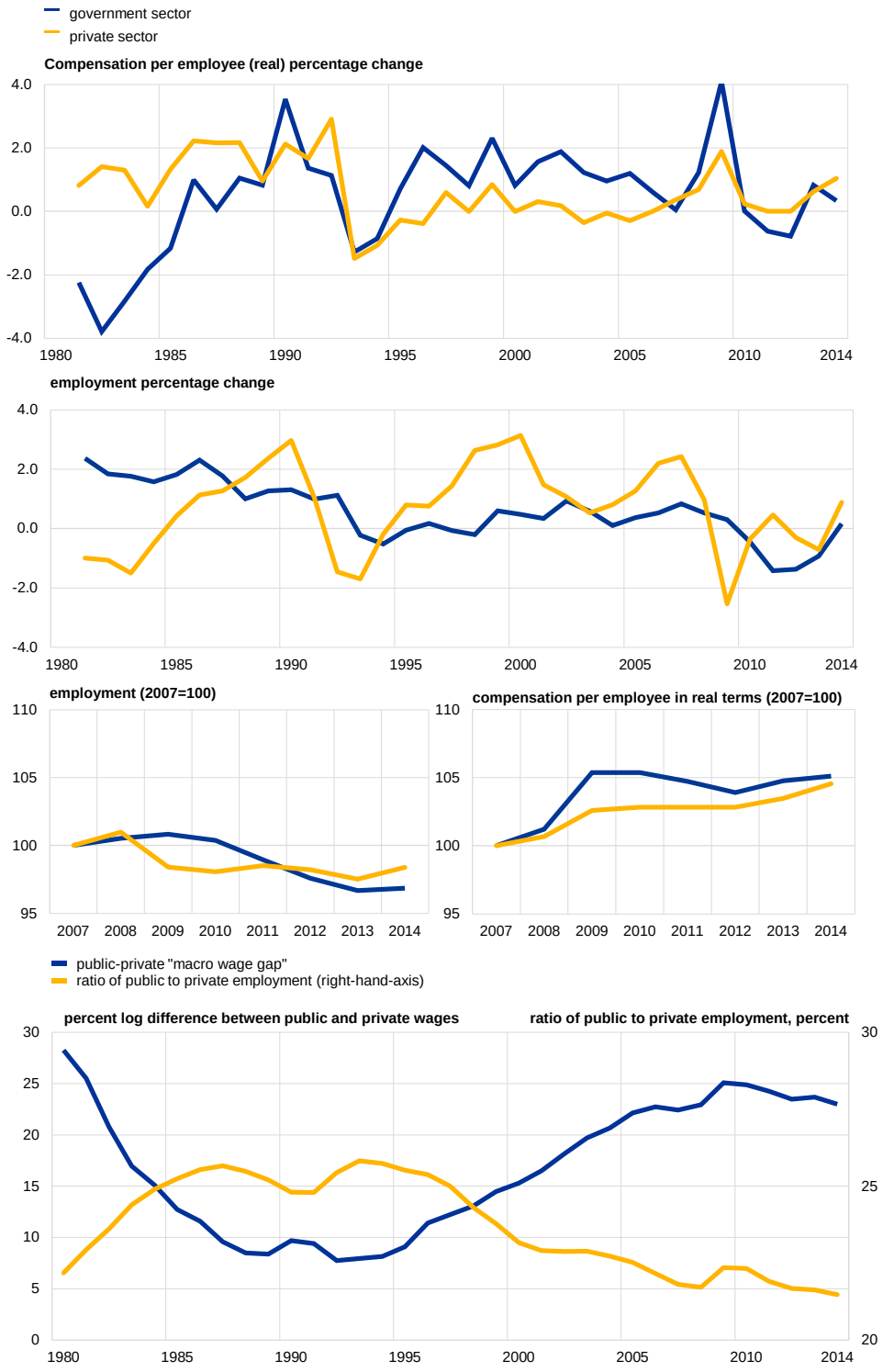
The euro area government wage bill during the recent fiscal consolidation episode




Source: Authors' calculations based on data from the national accounts and national sources (ESCB national central banks databases), and ECB's AWM database.
Note: The private consumption deflator is used to deflate nominal compensation of government employees. Total public spending excludes one-off support transfers to financial institutions.

## Chart 2

Euro area aggregate view on the evolution of public and private wages and employment



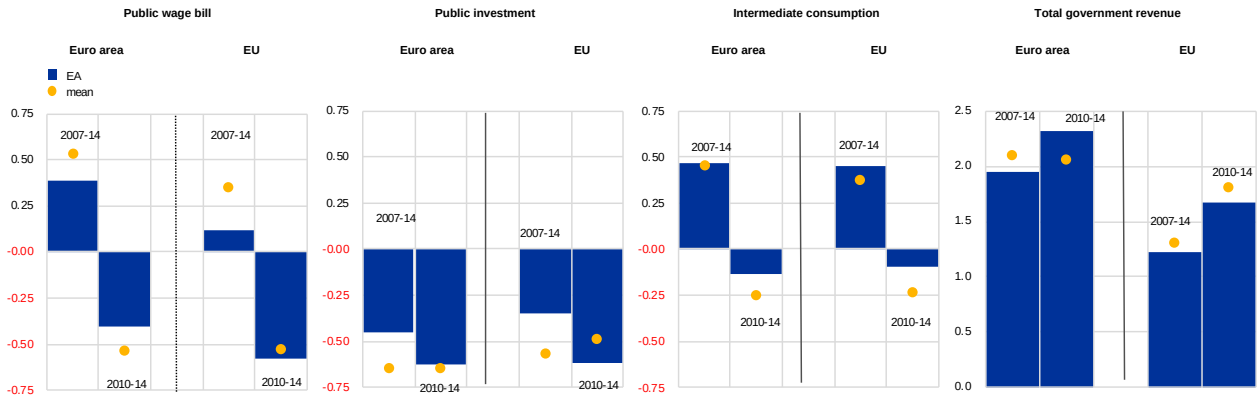

Source: Authors' calculations based on data from the national accounts and national sources (ESCB national central banks databases), and ECB's AWM database.
Note: The private consumption deflator is used to deflate nominal compensation of employees.

As regards employment, total cumulated losses were higher in the public sector over 2007-2014, due to the adjustment in the second part of the period. In historical terms, this was the most significant reduction of government employment in the last three decades. The reduction since the 2009 peak level of public employment was 3.5%, while in the previous episode that took place between 1992 and 1998, coinciding with the run-up to the EMU period, it amounted to less than 1%. In fact, from an aggregate euro area perspective, the level of government employment has remained almost constant at about 22 million persons since the beginning of the 1990s up to 2014, while private sector employment grew in the same period by some 20%. This explains the significant fall in the share of public employment vis-à-vis private employment in the last two decades (**Chart 2**, lower panel).

**Chart 3**

Aggregate view on the adjustment of the public wage bill versus other fiscal instruments

Change in the ratio of the fiscal instrument to GDP: aggregates (bars) and mean across countries (dots)




Source: Authors' calculations based on the data from the national accounts and national sources (ESCB national central banks databases).

Compared to other fiscal instruments, the containment of the public wage bill played a subdued role in the period of fiscal retrenchment (2010-2014) from a euro area and EU point of view (**Chart 3**). Nevertheless, there was large cross-country heterogeneity in the implemented public employment and wage policies, as analysed in Section 2.2 below. The adjustment of the euro area aggregate government wage bill accounted for 10% of the improvement in the structural general government budget balance-to-GDP ratio between 2010 and 2014 (15% for the EU as a whole). This share contrasts in particular with the role played by public investment (which represents a smaller part of overall expenditure),[8] which accounted for almost 20% of the fiscal correction, and also with the contribution of the remaining expenditure (excluding social payments), mainly other capital expenditure and subsidies.

8 For the entire 2007-2014 period, only 5 out of 28 EU countries registered a lower increase or a higher decrease in their ratio to GDP of government compensation to employees compared to the public investment-to-GDP ratio.

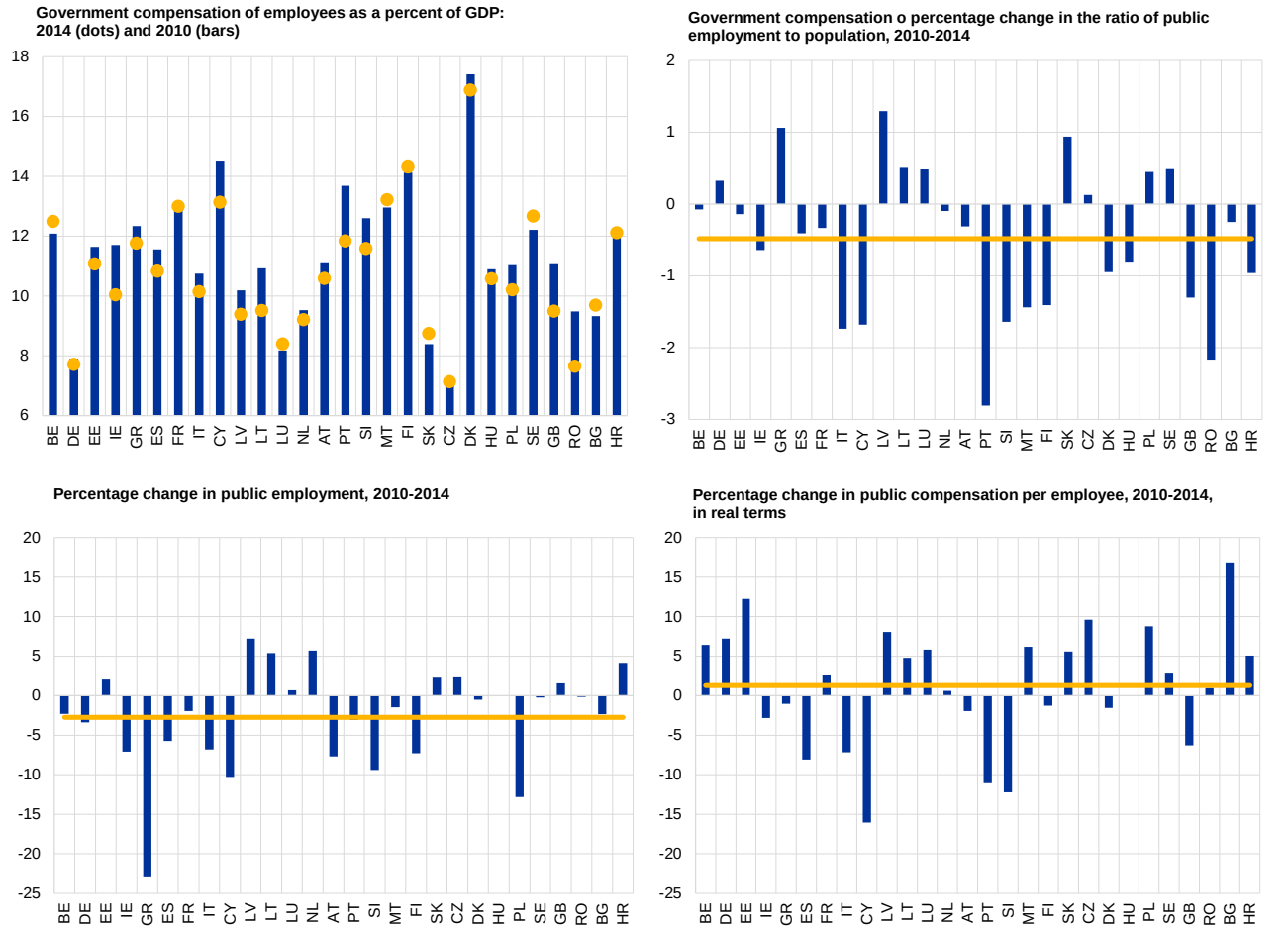
## 2.2 Cross-country heterogeneity in the evolution of the public wage bill

The evolution of the public sector wage bill exhibited substantial cross-country heterogeneity during the crisis (**Chart 4**). While a majority of countries reduced their public wage bill as a fraction of GDP between 2010 and 2014 (21 out 28 EU countries), with an average adjustment of 0.8 percentage points (p.p.) of GDP, the dispersion across countries was significant, ranging from a fall of 1.8% of GDP (Portugal) to -0.01% (France). For the group of countries in which this ratio increased, the average was, in any case, moderate (+0.32 p.p.). Notwithstanding the restraining policy, general government compensation of employees grew faster than nominal GDP over the whole 2007-2014 crisis period (i.e. there was an increase in the ratio to nominal GDP, despite the 2010-2014 adjustment).

**Chart 4**

Cross-country heterogeneity in the evolution of the public wage bill during the recent fiscal consolidation episode

(y-axis: government compensation of employees as a percent of GDP: 2014 (dots) and 2010; government compensation of employees as a percent of total public spending: change over 2010-2014;
percentage change in public employment, 2010-2014; percentage change in public compensation per employee, 2010-2014, in real terms)




Source: Authors' calculations based on data from the National Accounts and national central banks (ESCB) databases.
Note: The private consumption deflator has been used to compute government compensation per employee in real terms. In the case of Bulgaria, the change of compensation per employee is partially driven by the increase in 2013 of social security contributions by 20 p.p. In the case of Slovenia, the increase in the number of public employees is distorted by the reclassification of units in the general government sector after 2010. No data on public employment for the most recent years is available for Hungary: thus the zero figures shown in the two lower panels for this country are explained by the lack of available data.
Horizontal lines are averages over all EU countries.

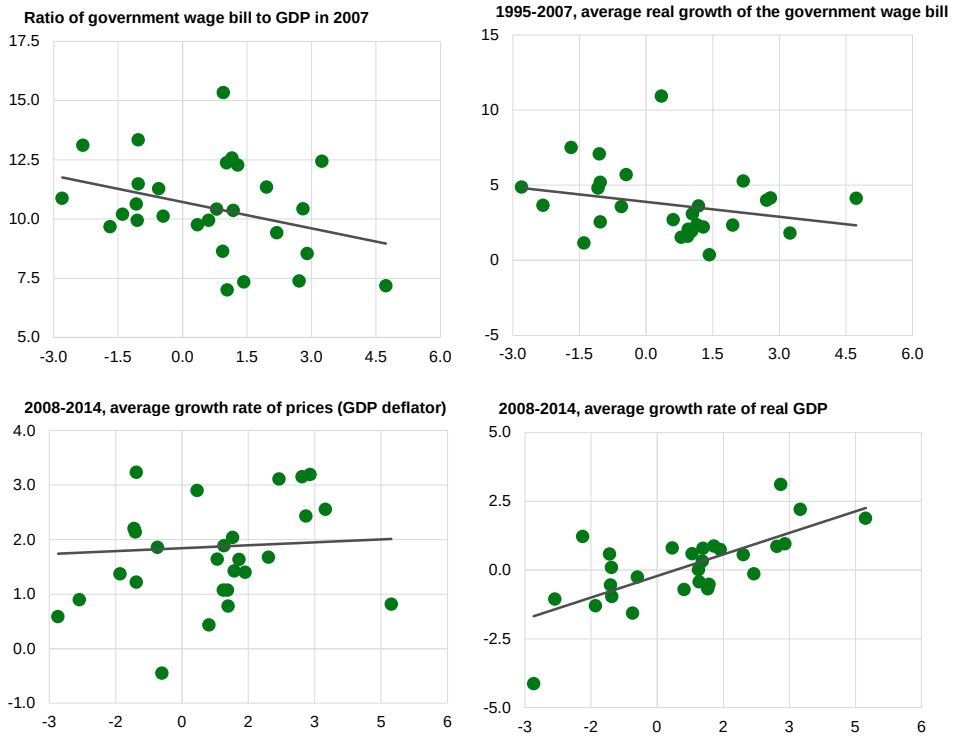
At the same time, though, the public sector wage bill fell as a proportion of total government expenditure during the crisis (2007-2014) in most EU countries (22 out of 28). This is broadly due to spending on social transfers (as a consequence of the acute impact of the crisis on employment) and interest expenditure (as a consequence of the sovereign debt crisis) exhibiting less restrain than the public wage bill. Within the wage bill, the variability of public employment and wages across countries was also substantial (**Chart 4**).

Despite the heterogeneity observed, some approximate common features of the fiscal adjustment effort can be highlighted (**Chart 5**). First, there is to some extent an association between the amount of adjustment implemented during the 2008-2014 period and the pre-crisis level of the public wage bill, measured either by its size in 2007 or by its medium-term pre-crisis dynamics (the top two panels in **Chart 5**). Second, countries that registered lower inflation rates were the ones that reduced their public wage bills more in real terms. Third, lower real GDP growth rates were associated with higher real reductions in public wage spending.

**Chart 5**

Overall features of the recent government wage bill adjustment in the EU

(x-axis: 2008-2014, average real growth of the government wage bill)



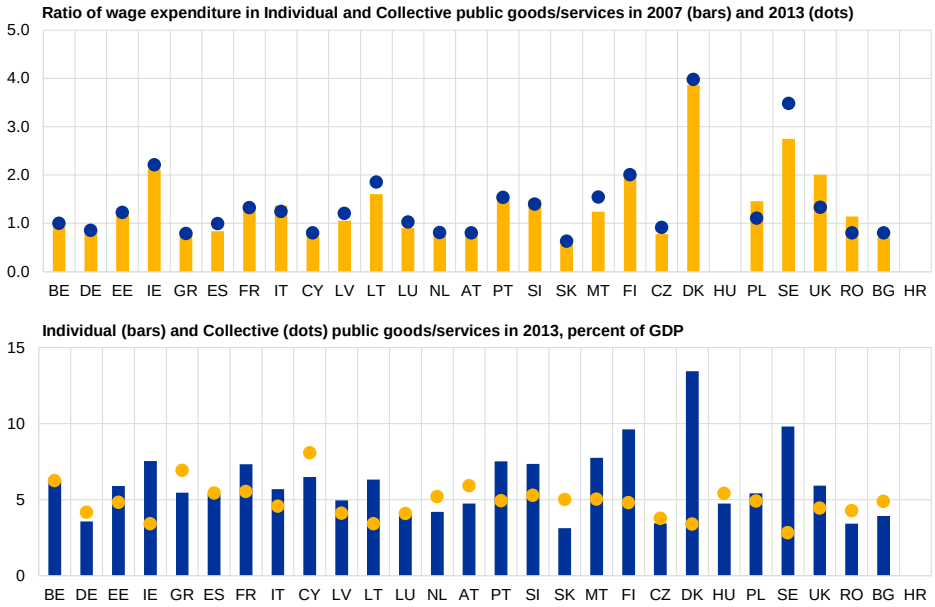

Source: Authors' calculations on the basis oSource: Authors' calculations based on data from the National Accounts and national central banks (ESCB) databases.

As regards the type of public goods/services, the wage bill adjustment was evenly implemented between individual and collective ones, as between 2007 and 2013, the ratio between government wage expenditure in individual and collective goods/services remained broadly constant for most countries (**Chart 6**). Individual

goods/services produced by general government are goods that can also be provided privately (according to international experiences), such as health, education and other services, while collective goods/services are typically provided in a quasi-monopoly-fashion, and include defence, public order, the judiciary and regulation. The latter class complements private sector production. The former, however, can substitute private sector activity. Thus, the ratio of public wage expenditure in individual goods/services to public wage expenditure in collective good/services is an indicator of the degree of substitution of private activity by public activity.[9] According to the evidence shown in **Chart 6**, then, the crisis did not significantly impinged on the existing cross-country heterogeneity regarding the production of different types of public goods/services.

**Chart 6**

Public wage expenditure by type of public goods and services (individual and collective)




Source: Authors' calculations based on COFOG General Government National Accounts data (Eurostat).
Note: 2012 for Germany, Ireland, Greece, France, Cyprus, Latvia, Lithuania, the Netherlands, Austria, Slovenia, Slovakia, Denmark, the UK, Romania, Bulgaria, and Malta.

## 2.3 The heterogeneity of policy responses

Measures aimed at containing governments' running costs (operational expenditure) were frequently used among EU countries in the 2007-2014 period, mainly from 2010 onwards. Government wage bill cost-containment measures have been more

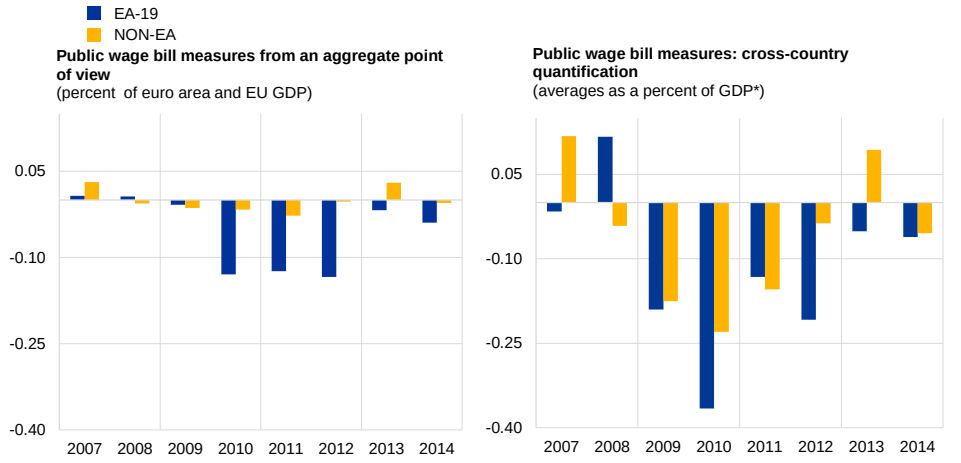
[9] For one approximation to measure the elasticity of substitution between public and private employment, see Fernández-de-Córdoba, Pérez and Torres (2012a).

frequent on the wage side, given the special status that (some) public sector employees enjoy as regards job security and redundancy (see Appendix III). The most common government wage measures were wage freezes and wage cuts, in some instances. A number of EU governments have implemented policies aimed at reducing staff numbers, particularly those with more strained public finances. The most common measures include new vacancy freezes and limitations on the replacement rate of retired workers.

Overall, public wage bill measures at the euro area aggregate level were limited, amounting to some 0.15% of euro area GDP per year during the 2010-2012 period, while they were negligible from an euro area aggregate perspective (**Chart 7**). Nevertheless, when accounting for individual-country heterogeneity, the picture changes. The average amount of restraining measures implemented by the governments of the countries that actually adopted consolidation policies is much larger than the EU average number. These countries mainly included those under a financial assistance programme (Ireland, Greece, Portugal and Cyprus), Spain, Italy, and Latvia.

**Chart 7**

Public wage bill measures in the euro area (EA) and EU, non-EA countries




Source: Authors' calculations based on a questionnaire prepared in consultation with fiscal experts of the European System of Central Banks. See Appendix III.
+ Only countries in which measures were implemented.

Policy measures also targeted the number of hours worked per government employee in some countries, which created room for additional staff adjustments. The impact of these measures can be analysed by using micro data. According to EU-SILC data (see Appendix I for a description of this data source), hours worked in a typical week by employees in government-related activities increased during the recent fiscal consolidation period for the euro area as a whole and in particular in countries subject to greater fiscal stress (**Table 1** and **Chart 8**). In particular, for the euro area pool the mean weekly number of hours worked by government employees (NACE proxy OPQ) increased from 34.9 in 2007 to 35.6 in 2012 (the median being 36 to 38), while it rose from 35.2 to 35.9 in countries subject to fiscal stress during the crisis, namely Greece Cyprus, Spain, Ireland, Portugal, Greece and Italy (the median being 36 to 37). In the latter group of countries, the mean number of hours

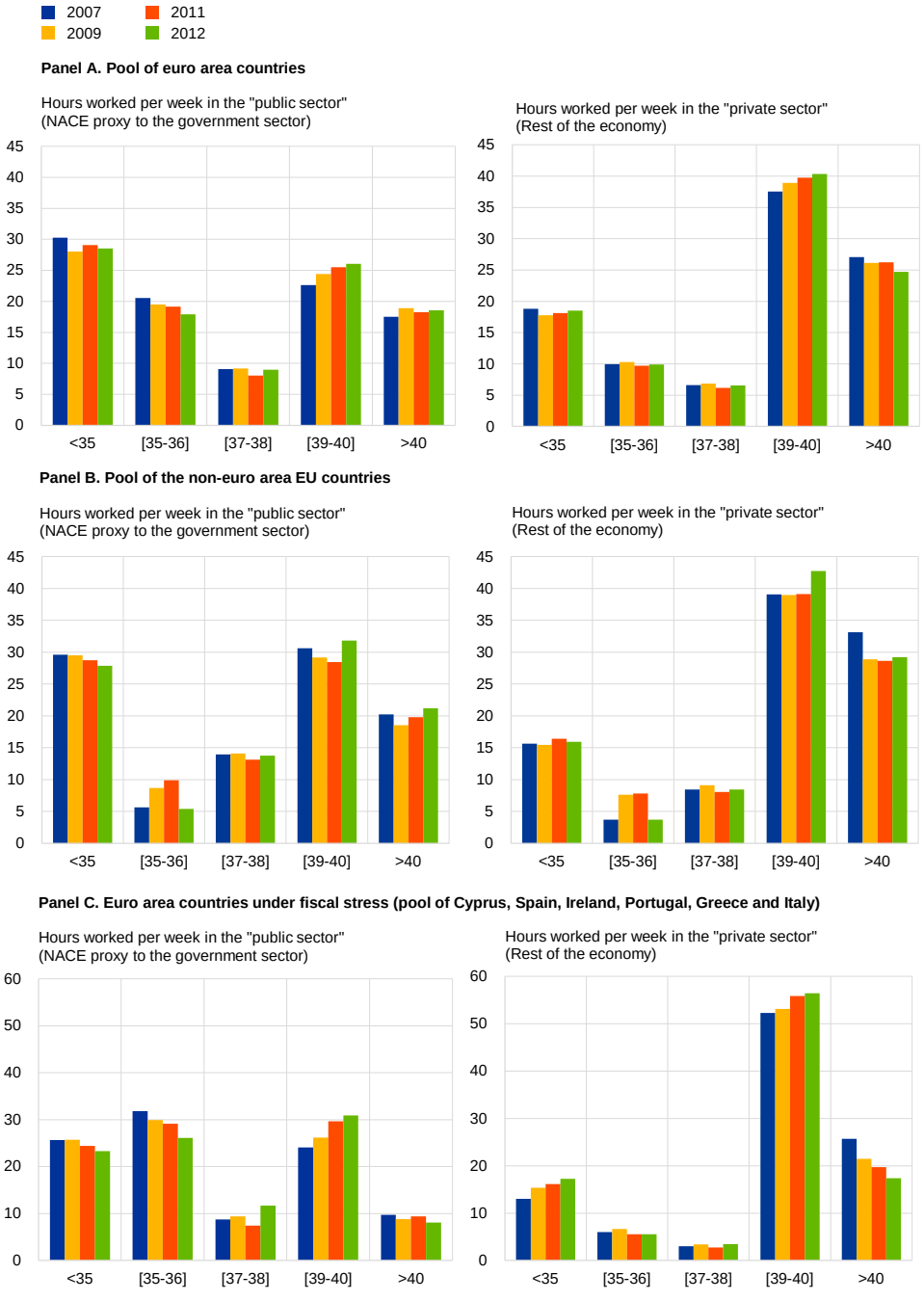
worked per week in the private sector, on the contrary, decreased. Increases in hours per extant employee may have created some room for staff reductions, mainly of public employees with temporary contracts. In addition, increases in hours worked were implemented without an accompanying wage compensation. Thus, government wages per hour are not as inflexible as commonly believed when compared with the private sector.[10]

[10] In this regard see Kopelman and Rosen (2016).

## Chart 8

Distribution of hours worked per week in the public and private sectors

(percentages of workers in each interval of hours)




Source: Authors' calculations on the basis of EU-SILC (Eurostat)
Note: Hours correspond to the number of hours usually worked per week in main job.

**Table 1**

Statistics on the distribution of hours worked per week (2007-2012)

| | Mean | | | Median | | Variance | |
|---|---|---|---|---|---|---|---|
| | 2007 | 2012 | Diff | 2007 | 2012 | 2007 | 2012 |
| **Hours worked per week (EU-SILC survey)** | | | | | | | |
| Euro Area | | | | | | | |
| NACE OPQ proxy to the government sector | 34.9 | 35.6 | *** | 36.0 | 38.0 | 106.5 | 93.3 |
| Rest of the economy ("private sector") | 38.0 | 38.1 | | 40.0 | 40.0 | 118.7 | 97.3 |
| Public Administration (NACE O) | 37.4 | 38.0 | *** | 38.0 | 39.0 | 75.8 | 60.4 |
| Rest of European Union | | | | | | | |
| NACE OPQ proxy to the government sector | 35.8 | 36.7 | *** | 39.0 | 40.0 | 117.0 | 112.3 |
| Rest of the economy ("private sector") | 39.6 | 39.5 | | 40.0 | 40.0 | 111.8 | 107.8 |
| Public Administration (NACE O) | 38.7 | 39.3 | * | 40.0 | 40.0 | 71.8 | 68.9 |
| Euro area countries under fiscal stress | | | | | | | |
| NACE OPQ proxy to the government sector | 35.2 | 35.9 | *** | 36.0 | 37.0 | 71.4 | 55.1 |
| Rest of the economy ("private sector") | 39.9 | 38.4 | *** | 40.0 | 40.0 | 78.9 | 75.1 |
| Public Administration (NACE O) | 37.2 | 37.9 | *** | 37.0 | 38.0 | 47.3 | 34.8 |

Source: Authors' calculations based on EU-SILC (Eurostat).
Note: Hours correspond to the number of hours usually worked per week in main job. In the column "Diff" we show the probability of rejecting the null hypothesis of a Wald test of equality of means in 2007 and 2012: *** denotes a p-value lower than 1%, ** a p-value lower than 5%, and * a p-value lower than 10%, while a blank means that the null hypothesis cannot be rejected.

## 2.4 The wage bill adjustment: temporary or permanent?

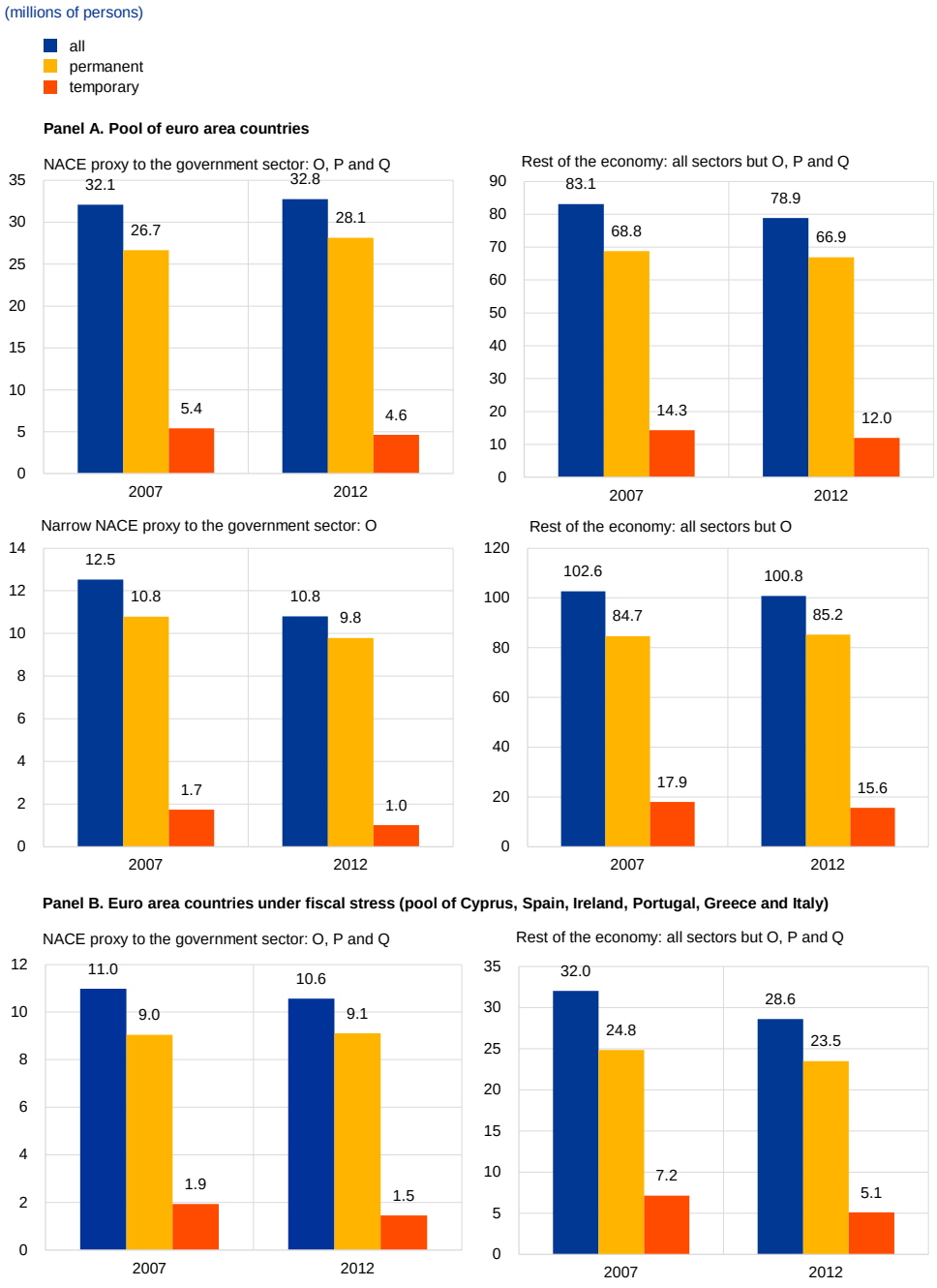
Recent public employment and wage policies have been part of a response to the perceived fiscal sustainability risks, that increased with the crisis. In adverse cyclical conditions the government budget constraint tightens, and as a consequence different fiscal instruments have to be adjusted. When cyclical conditions become normalised, the need for fiscal adjustment loosens and even a reversal to pre-crisis conditions might be expected. Indeed, the historical experience with policies aimed at containing public wage growth shows that they might not end up being of a structural, permanent nature. On the contrary, catching-up processes in good economic times tend to counteract the initial government wage bill reduction, either partly or completely.

The most recent experience shows that a significant portion of the public employment adjustment hinged on government workers with temporary contracts. Some insights can be drawn in this regard from EU-SILC data, available for the period up to 2012. According to the broader NACE proxy to government employment (OPQ) (**Chart 9**), the adjustment of employment in government-related activities between 2007 and 2012 depended to a significant extent in net terms on workers with temporary contracts, while the number of employees with permanent contracts in NACE OPQ sectors increased over that period of time. In the NACE O sector ("Public Administration") there was a reduction in both the number of permanent and

temporary workers between 2007 and 2012, but the latter fell more in relative terms. Country-specific studies with alternative data sources confirm this finding.[11]

## Chart 9

Number of employees in the public and private sector by type of contract




Note: Hours correspond to the number of hours usually worked per week in a main job.

[11] See for instance Montesinos et al. (2015).

Consolidation measures, as discussed above, have increased average hours worked by public employees and as a consequence may have reduced the need to revert to pre-crisis staff levels (temporary hires). Nevertheless, it could be the case that the adjustment of employment witnessed recently ends up being of a transitory nature, as in previous episodes of economic hardship.

**Table 2**

Medium-term trends in the ratio of general government employees (Ng) to total employment in the economy (N)

(percent)

| | Ratio of government employees to total employment: Ng/N | | | | Change in th ratio: (Ng/N)t – (Ng/N)t-i | |
|---|---|---|---|---|---|---|
| | 1980 | 1999 | 2007 | 2014 | 1980-2007 | 2007-2014 |
| Belgium | 19% | 18% | 18% | 18% | -0.5% | 0.0% |
| Germany | 13% | 12% | 11% | 11% | -2.0% | -0.7% |
| Ireland | 20% | 14% | 15% | 15% | -5.0% | 0.4% |
| Greece | 13% | 18% | 19% | 16% | 5.3% | -2.2% |
| Spain | 8% | 14% | 12% | 14% | 3.4% | 1.9% |
| France | 18% | 22% | 21% | 21% | 3.0% | -0.2% |
| Italy | 13% | 16% | 14% | 14% | 1.0% | -0.7% |
| Luxembourg (1985) | 16% | 16% | 18% | 19% | 1.8% | 1.0% |
| The Netherlands | 20% | 15% | 14% | 14% | -5.9% | -0.1% |
| Austria | 16% | 16% | 16% | 16% | 0.5% | -0.7% |
| Portugal | 9% | 14% | 14% | 14% | 5.6% | 0.1% |
| Finland | 16% | 25% | 25% | 25% | 8.8% | 0.8% |
| Denmark | 27% | 29% | 29% | 30% | 1.9% | 1.5% |
| UK | 27% | 19% | 19% | 17% | -8.0% | -2.5% |
| Sweden | 32% | 31% | 30% | 28% | -1.9% | -1.8% |
| United States | 16% | 15% | 15% | 15% | -1.3% | -0.3% |
| Japan | 9% | 8% | 8% | 8% | -0.4% | -0.5% |

Source: ESCB, EUROSTAT (ESA2010) and OECD Economic Outlook Database. Data sources are heterogeneous and as such the numbers in the table have to be taken as being only indicative of underlying individual country trends.

Another remark is that it is difficult to assess what is or should be the optimal level of public employment of a given country. In fact, the share of public employment vis-a-vis private employment varies significantly both across countries and within countries over time (**Table 2**). Since the early 1980s a downward trend in the ratio of government-to-private employment is visible in a number of countries, particularly in those countries with a larger public labour force. Nevertheless, other countries followed the opposite trend, particularly those with lower starting levels. Against this background, though, the size of the contraction during the recent fiscal consolidation episode seems to be more significant in countries in which public employment followed an upward trend vis-à-vis the private sector in the pre-crisis period. In those countries, private sector employment losses during the crisis were also more significant, which contributed to the tightening of government resources.

## 2.5 The supporting role of fiscal-structural policies

Beyond policy actions with a short-term (budgetary) impact (see Appendix III - A), a number of measures of a more structural nature have been implemented in recent years (see Appendix III - B). In particular, policy initiatives to streamline public administration are encouraging. In addition, some renewed discussion is taking place on policy actions that focus on the substitutability/complementarity between the public and the private sector as regards public production of goods/services vs. public financing of private provision.

The literature claims that sustained reductions in the public wage bill are more likely to be achieved by countries that simultaneously adopt a wide range of structural public sector reforms and/or discretionary wage bill reduction measures. In addition, social dialogue between governments and labour market partners is also highlighted as a contributing factor (IMF, 2015; Forni and Novta, 2014). In previous episodes of public employment reform, measures of this kind were associated with a more contained evolution of the government wage bill following a crisis episode, as the budgetary savings were kept over time. One may also claim that savings were related to the increased efficiency of the government sector induced by the structural measures. As regards public wages, policies of a more structural nature include human management/pay reforms, such as tightening the link between pay and performance, or changes in wage bargaining mechanisms within the government sector. A few measures along these lines have been put in place recently, in some cases in the framework of ongoing “public spending reviews”. A group of measures are aimed at streamlining the size, structure and scope of government, such as the elimination of redundancies among levels of government, the simplification of procedures or reorganisation of services, and the consideration of alternatives to the public production of goods/services, including the introduction of schemes to publically finance private provision.

Based on the micro-data evidence supporting this paper, a positive conditional public-private wage gap emerges as a structural characteristic of many EU countries (see Appendix II). In this respect, some policy proposals have been recently put forward to reduce the wage gap. Several theoretical papers (see for example Economides, Philioppopoulos and Varthalitis, 2015a; Gomes, 2014) show that establishing parity between working conditions in the public and the private sectors can be welfare-improving under certain conditions. In particular, specific policies may be aimed at introducing more job flexibility in the public sector, or explicitly linking public-wage setting to the productivity of the market economy. Other authors (see, for instance, Ujhelyi, 2014) inspect the benefits of civil service rules, exploring the conditions under which the existence of tenured “bureaucrats” raises or decreases overall economy welfare. Nonetheless, all these proposals tend to be put forward in abstract terms, i.e. they do not take into consideration the country-specific heterogeneity observable in the data that is at the root of differences across countries.

# 3 The macroeconomic effects of public wage bill reform

This section is aimed at providing some evidence on the possible positive medium to longer-term benefits to the economy of using public wages and employment as fiscal consolidation instruments, when compared with other fiscal instruments. We look at these issues taking as given that a certain amount of fiscal consolidation had to be delivered to counteract a situation of fiscal stress. Contrary to other fiscal instruments, public employment and wages' policies induce spillovers on private sector employment and wages through labour market dynamics. While the focus of this section is on the euro area as a whole, country-specific facts are also provided, where possible, based on comprehensive macro and micro datasets.

## 3.1 An overview

The macroeconomic effect of public wage bill restraint is the outcome of a trade-off between direct (negative) demand effects and indirect (positive) effects that occur through the labour market. A seminal work Alesina et al. (2002) found that reducing public wage expenditure generates reductions in private wages per employee, which improves competitiveness, increasing profits, investment, and economic growth. Along similar lines, Bermperoglou et al. (2013) found that cuts in government vacancies generate large output losses (direct effects dominate), while wage cuts have, if anything, insignificant expansionary effects (indirect effects dominate). See also Lamo, Moral-Benito and Pérez (2016) along the same lines.

These channels are illustrated in **Table 3**, where some quantitative insights are shown on the basis of the ESCB macro econometric models of Lithuania (Celov, 2015) and Spain (Hurtado et al., 2014). In the two models, public employment is exogenous, but public wages influence private sector wages. In both models, in response to a cut in public wages (by 1% of GDP) private consumption and wages fall, while investment and net exports increase. The direct adverse GDP effect is thus mitigated by the increased competitiveness of the economy. Under a public employment shock, the impact on wages is much lower, as it only relates to the increase in economic slack, measured by the unemployment rate – thus the GDP costs are larger.

The possible mechanisms operating to offset the negative short-term macroeconomic impact are explored. A key argument is that public wage restraint may set in motion a labour market adjustment through the inter-linkages with private wages. This is particularly important when public wage policy influences private sector wage-setting decisions (e.g. "leadership" or "signalling" role of government wages).

**Table 3**

The impact of public wage and employment shocks in two macro-economic models (for Lithuania and Spain)

| Country: | Spain | | | | | | Lithuania | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Shock (-1% of GDP): | Public wage shock | | | Public employment shock | | | Public wage shock | | | Public employment shock | | |
| Year | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 |
| *Percentage deviations from steady-state* | | | | | | | | | | | | |
| GDP | -0.09 | -0.18 | -0.23 | -1.11 | -1.17 | -1.24 | -0.06 | -0.07 | -0.06 | -0.10 | -0.04 | -0.07 |
| Private consumption | -0.28 | -0.62 | -0.85 | -0.19 | -0.35 | -0.51 | -0.17 | -0.17 | -0.16 | -0.17 | -0.31 | |
| Investment | 0.28 | 0.38 | 0.39 | 0.04 | 0.13 | 0.10 | -0.01 | -0.01 | 0.01 | 0.10 | 0.07 | 0.08 |
| HICP | -0.09 | -0.20 | -0.27 | -0.22 | -0.34 | -0.38 | 0.00 | -0.02 | -0.03 | 0.00 | -0.01 | -0.02 |
| Wages | -2.80 | -3.15 | -3.35 | -0.31 | -0.48 | -0.57 | -0.26 | -0.27 | -0.29 | -0.02 | -0.06 | -0.09 |
| Employment | -0.08 | -0.22 | -0.34 | -1.77 | -1.88 | -1.97 | 0.01 | 0.02 | 0.02 | -0.25 | -0.24 | -0.22 |
| Exports | 0.09 | 0.19 | 0.24 | 0.04 | 0.13 | 0.18 | 0.00 | 0.014 | 0.02 | 0.15 | 0.17 | 0.18 |
| Imports | -0.19 | -0.38 | -0.46 | -0.19 | -0.25 | -0.34 | -0.06 | -0.05 | -0.05 | 0.06 | 0.02 | 0.02 |
| Net exports (% of GDP) | 0.09 | 0.21 | 0.27 | 0.08 | 0.12 | 0.15 | 0.04 | 0.03 | 0.04 | 0.07 | 0.10 | 0.12 |
| Fiscal balance (% of GDP) | 0.45 | 0.33 | 0.25 | 0.50 | 0.46 | 0.43 | 0.07 | 0.08 | 0.09 | 0.10 | 0.11 | 0.13 |

Source: Author's calculations based on Celov (2015) and Hurtado et al. (2014).

The literature has found robust evidence of significant interrelations between public and private sector wages per employee. A wealth of recent empirical papers provides evidence of a direct causal relationship between these variables (Holm-Hadulla et al., 2010; Pérez and Sánchez, 2011; Lamo, Pérez and Schuknecht, 2012). While private wages tend to lead public wages in the long-run, for some countries bi-directional causality (i.e. running from public to private wages and vice versa) is found. The main theoretical reference is the well-known Scandinavian model of inflation. With this, especially in the case of fixed exchange rates, there is an obvious case for the traded-goods sector being the "wage leader", i.e. wage leadership is exerted by the sector more open to competition (Lindquist and Vilhelmsson, 2006). Cross-country differences exist in public wage spillovers due to differences in domestic labour and product market institutions. The probability of public wages leading private sector wages is stronger in countries where wage bargaining centralisation and coordination is high and in which there are high levels of union membership, while it is weaker the greater the openness to trade and the presence of wage indexation (Lamo, Pérez, and Sánchez-Fuentes, 2013).[12]

Section 3.2 describes how the recent consolidation period has contributed to some competitiveness gains in the euro area, in view of the evidence provided on the partial correction of the public-private wage premium. On the other hand, section 3.3 discusses some evidence on the efficiency gains in the labour market dynamics, based on the complementarity of public-private goods and their relative wage

[12] In turn, wage-setting institutions and practices in the public sector vary considerably across EU countries in several respects, including in particular the role of collective bargaining versus government legislative decision, the degree of centralisation of collective bargaining, or union density, See EC (2014) for an in-depth comparative analysis of labour market institutions and practices of EU governments. See also Giordano et al. (2015).

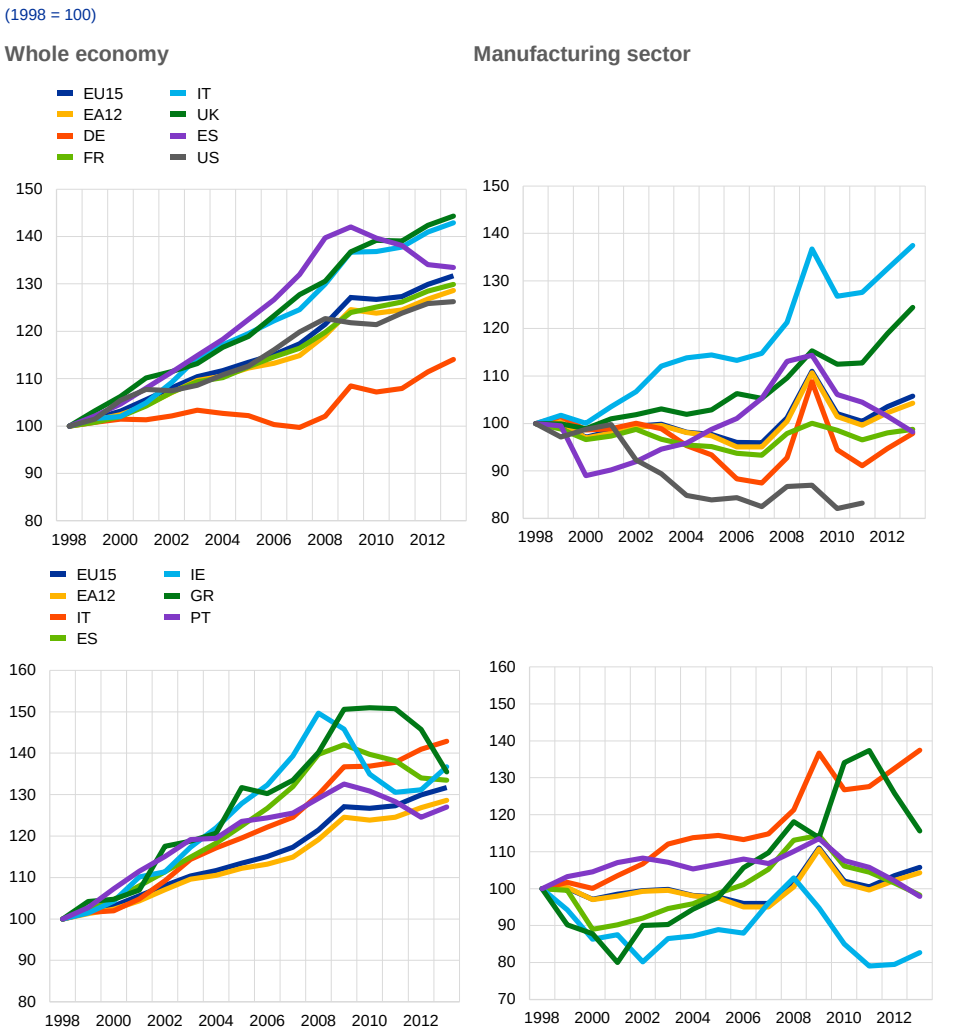
compression. It must be noted that the implementation of fiscal-structural reforms explained in section 2.5 is also aimed at increasing efficiency in the public sector.

## 3.2 The competitiveness channel

The facts are that EU countries that were subject to substantial fiscal stress during the crisis were among the ones that cumulated larger competitiveness losses in the pre-crisis period (**Chart 10**). At the same time, though, these countries have corrected part of their imbalances since the beginning of the crisis. The evolution of public wages may have played a role in this correction.

**Chart 10**

Evolution of nominal unit costs in selected EU countries




Source: Authors' calculations based on AMECO: ratio of compensation per employee to real GDP per person employed.

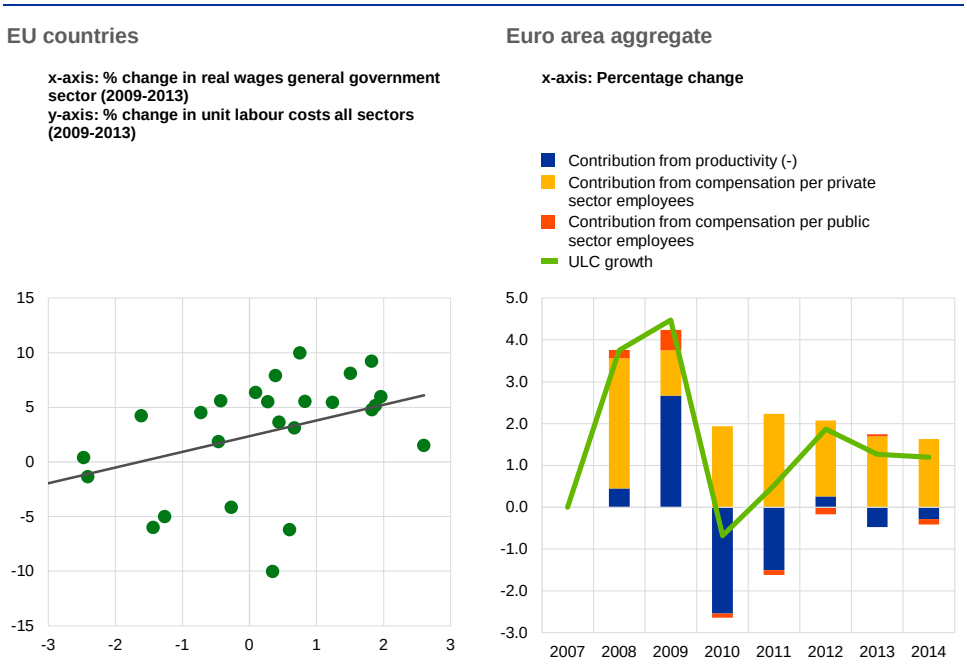
First, more relaxed wage conditions in the general government sector have a direct impact on overall economy competitiveness given its significant share in the total. Overall, the restraint in public wages directly reduced unit labour cost (ULC) growth

in the euro area during the 2010-2014 period (**Chart 11**). The contribution to ULC growth from compensation per public sector employee was limited to -0.1 percentage point per annum over 2010-2014, which contrasts with the positive contribution from compensation per private sector employee (1.8 p.p. on average per annum for the same period). The contribution from productivity has been erratic over the reference period, but this factor has helped to improve overall cost-competitiveness (around 0.3 p.p. on average per annum).

Beyond this direct impact, there could be other mechanisms at work. Given the aforementioned potential leadership role of public wages in some countries, [13] there could also be an indirect effect from public wages on ULC by setting in motion beneficial labour market dynamics. It is difficult to assess, however, to what extent private wage developments in recent years may have been influenced by those in the general government sector.

**Chart 11**

Unit labour costs and real public wages




Source: Authors' calculations from AMECO and ESCB databases. Countries included in the left panel are the EU-28 excluding Bulgaria.

The existence of distortions in public-private wage gaps (see Appendix II for a detailed explanation and quantification) can be particularly harmful for competitiveness given that public sector activities are concentrated in non-tradable sectors, which are less exposed to international competition. The wage gap is

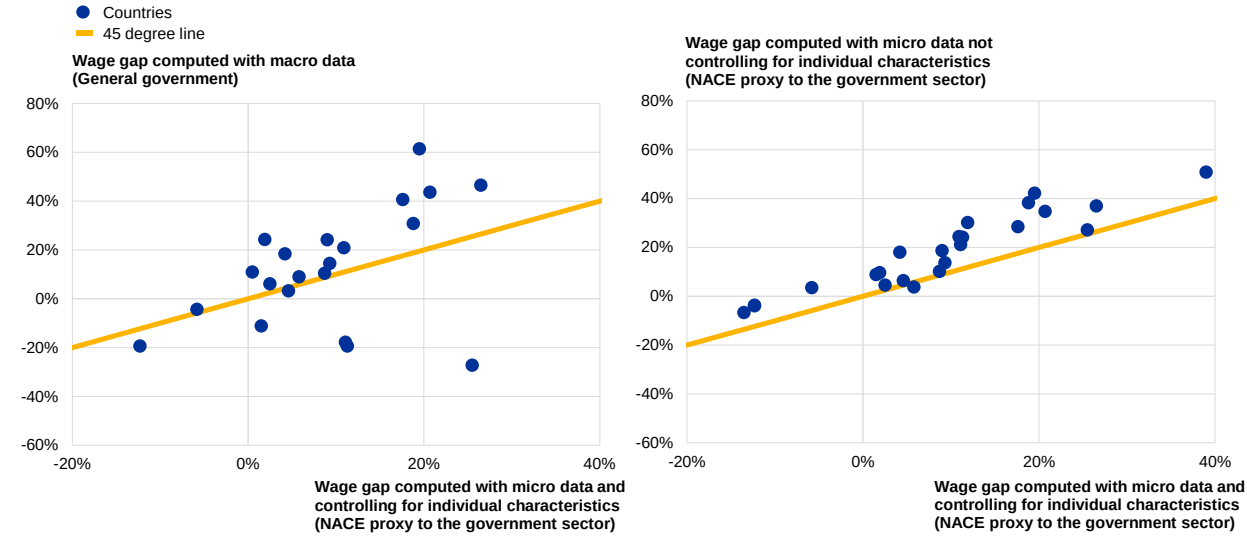
[13] The probability of public wages leading private sector wages is higher in countries where wage bargaining centralisation and coordination is high and where there are high levels of union membership, while it is weaker when there is greater openness to trade or wage indexation (Lamo, Pérez, and Sánchez-Fuentes, 2013).

estimated to rise after controlling for workers' characteristics and stems mainly from differences between workers' wages at the low end of the wage distribution. As an example, for the euro area and the group of non-euro area countries shown, the wage premium is estimated to be positive for workers in the lower 10% quantile of the wage distribution, and turns negative in the top 10% (90% quantile) (**Chart 12**).

**Chart 12**

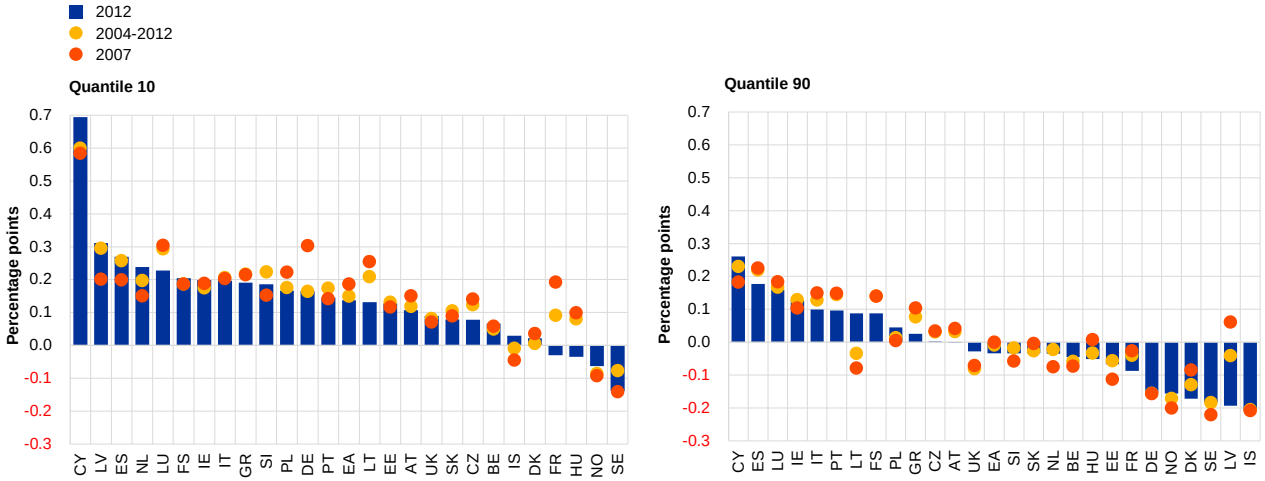
The public-private sector pay gap in the EU

**Panel A. Different definitions of the public-private wage gap (average of 2004-2012)**




**Panel B. The public-private wage gap at different parts of the wage distribution with micro data**

(NACE definition of the government sector O, P, Q controlling for individual characteristics; percentages points)




Source: Authors' calculations based on National Accounts data (macro data) and EU-SILC database (micro data). Countries included in the first panel are the EA aggregate and all EU-28 with the exception of Malta, Finland, Bulgaria, Poland, Romania, and Croatia. Countries included in the remaining panels are the same plus Norway and Iceland. For the computation of micro-based gaps we referred to Campos et al. (2015).

There is evidence that the recent public wage restraint has driven the partial correction of the existing positive public-private wage premium in the euro area. Macro (aggregate) data illustrated in **Chart 2** (last panel) show a relative decline of 2 p.p. of the ratio of public-to-private wages per employee for the euro area (from

25% in 2009 to 23% in 2013). This reversed the upward trend in the wage gap since the second half of the 1990s[14]. Micro data analysis also supports this favourable trend, as the estimated (unexplained) wage gap has been recently reduced. For the euro area as a whole, the estimated conditional wage gap for the 2008-2012 period for the broader NACE proxy of government-related activities is 40% lower than the one estimated for the 2004-2007 period. In turn, for 2012 the gap was 55% lower than the one estimated for 2007 (see **Chart 12** above, and Campos et al., 2015).

The reduction of the (unexplained) wage gap has been, however, uneven over the wage distribution and across different types of workers. For the euro area pool and the group of non-euro area EU countries the wage premium dropped more significantly at the upper end of the wage distribution between 2007 and 2012 (**Chart 12**, Panel B, differences between bars and dots in both panels).[15] In fact, most of the countries have smaller or negative public-private wage differentials in quantile 90 of the income distribution, than at the lower end of the wage distribution (quantile 10).

The dynamics of the gap during the crisis reflect the different behaviour of wages and hours worked in the public and the private sectors. Wages per hour worked grew much faster in the private than in the government sector over 2007-2012 for the pools of euro area and non-euro area EU countries. On the individual country level, wage per hour growth was higher in the private sector in 15 out of the 23 individual EU countries studied, reflecting the generalised implementation of cost-containment policies in the public sector over that period, most notably since 2010. In particular, there was an increase in hours worked in a typical week for employees in government-related activities (particularly in countries under fiscal stress). Data for the private sector indicate an opposite trend.

The sectorial structure of the country, between tradable goods and services and non-tradable sectors, may also be instrumental to understanding the public pay gap (**Chart 13**). Indeed, compared to the baseline estimated wage premium, the "Scandinavian model" seems to operate partially, as public-private wage gaps are reduced when public wages are compared to wages in the tradable sectors, instead of those in the overall private sector delimitation used before (all sectors except OPQ). In particular, the premiums of Belgium, Germany, and the UK turn negative, while that of France becomes more negative. In general premiums with respect to the tradable sector are lower, even though there are exceptions.

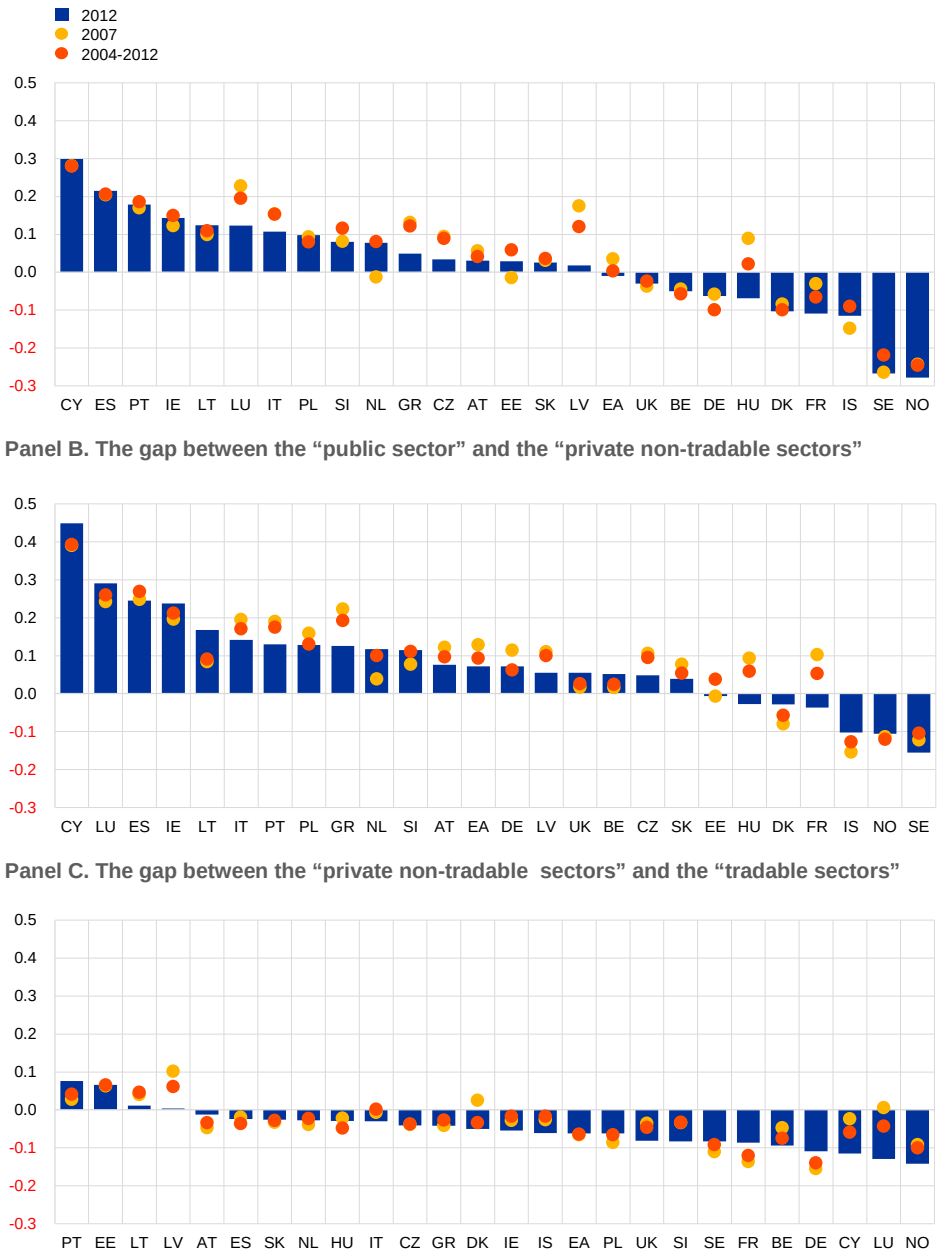
---

14 Since the start of EMU, certain peripheral countries experienced high and volatile public wage growth, coupled with positive public-private wage gaps, and rapid increases in unit labour costs, facts that have been linked by some authors to the overall economy loss of competitiveness witnessed in the pre-crisis period (see e.g. Holm-Hadulla et al., 2010; Fernández de Córdoba, Pérez and Torres, 2012a; García-Rodríguez, 2015; or Kollintzas, Papageorgiou, and Vassilatos, 2015; Campos et al, 2015).

15 In the former case, the lower 10% premium moved from 0.19 in 2007 to 0.14 in 2012, while in the upper 10% the wage premium decreased from 0.00 to -0.03. For a number of countries, though, the change by quantiles went in opposite directions, reflecting in some cases policy measures aimed at reducing wage differentials within the government sector or targeting certain groups of public workers. However, at the upper end of the wage distribution, the literature shows that the premium may reflect more the impact of characteristics whereas at the lower end it reflects unobserved characteristics.

**Chart 13**

The public-private sector pay gap: tradable versus non-tradable sectors




Source: Authors' calculations based on National Accounts data (macro data) and EU-SILC database (micro data). Countries included are the euro area pool (EA), all EU-28 countries with the exception of MT, FI, BG, PL, RO, and HR, plus Norway and Iceland (in this case 2011 instead of 2012 estimates). For the computation of micro-based gaps we referred to Campos et al. (2015).

## 3.3 The efficiency channel

The assessment of the efficiency of labour market flows provided here is based on two concepts: the complementarity between public and private employment, and the wage dispersion in the public vis-à-vis the private sector.

The size and strength of the impact of reductions in public employment mainly depends on the degree of complementarity between the public and private sectors. Government activity complements private sector activity through the provision of collective goods/services (like the judicial system), while at the same time partially competes with (substitutes) the private sector in a number of sectors (like education or health). A decrease in public jobs in sectors that produce highly substitutable products can directly spur private jobs. However, in sectors in which public and private production complement each other, there exists the possibility that a reduction in public employment negatively affects private sector employment, if public production positively affects the marginal product of labour in the private sector (see Maley and Moutos, 1996; Algan et al., 2002).

**Chart 14**

Response to a public wage bill (positive) shock in a small-scale DSGE model calibrated for the euro area

(percentage deviations from steady state values)

***Lines differ in the degree of the elasticity of substitution between public and private employment. Dashed line: 1.1 (baseline calibration); Solid line: 1.7; Dotted line: 5.***


Source: Authors' calculations based on Fernández-de-Córdoba et al. (2012).

The empirical literature tends to find that public employment crowds-out private sector employment. An increase in vacancies in the public sector causes labour flows from the private to the public sector if a positive public-private wage gap exists. This leads to an increase in private sector wages and a potential reduction of private sector employment (Stepanyan and Leigh, 2015). The dependence on the degree of public-private substitutability is exemplified by means of simulations of a small-scaled DSGE model for the euro area (**Chart 14**). The model encompasses a positive public-private wage gap and an aggregate production function in which output is produced by combining public and private employment. The elasticity of

substitution between public and private employment modulates the degree of complementarity in production of the two inputs. The shock consists of an increase in the public sector wage bill implemented through an increase in public wages and in public employment by about the same proportion. This increase in the public wage bill is self-financed by an increase in the income tax rate.[16]

A second factor in determining the economic incentives inducing people to enter or leave a sector, is the relative wage dispersion, i.e. the shape of the wage structure. It has been argued that the public sector finds it more difficult to attract and retain highly skilled workers as a result of a relatively higher wage compression (see e.g. the seminal work of Borjas, 1993).

In the case of the euro area pool, according to EU-SILC data, the distribution of public wages became more compressed between 2007 and 2012 (the coefficient of variation of log hourly wages decreased by 6% for the broad definition of government-related sector). Nevertheless, in relative terms, the ratio of the coefficient of variation of log hourly wages in the public and the private sectors increased from 0.85 in 2007 to 0.88 in 2012 for the euro area pool, and from 0.76 to 0.81 for the pool of non-euro area EU countries. At the same time, though, relative wage compression increased in the 2010-2012 period for the euro area pool (and in 15 out of the 17 countries analysed), broadly due to increased wage compression in the public sector. The opposite happened in the group of non-euro area EU countries. Discretionary policies implemented during the recent fiscal consolidation process may be at the root of this increase in public wage compression.

[16] The relative strength of the channels outlined above depends on the degree of economic slack (see, e.g. Michaillat, 2014, for a theoretical model, and Lamo et al., 2016, for empirical results).

# 4 Policy discussion

Well-designed government wages and employment policies and reforms may generate overall economy competitiveness gains and increase the efficiency of the labour market. In times of fiscal stress, public employment adjustments can affect GDP and total economy employment positively if there are large inefficiencies in the government sector and/or there is high substitutability between private and public sector output. Public wage policies can have beneficial effects on competitiveness if they are targeted to influence overall economy wage moderation (via “wage leadership”). In addition, if a public pay gap exists, the latter positive effect of public wage restraint becomes amplified as labour market inefficiencies are also reduced, provided policies are correctly designed.

While public sector demand across the euro area is needed in the current circumstancies to support economic growth, in some countries fiscal consolidation needs are still high, and recent government wage bill savings are to be preserved. When cyclical conditions become normalised, the need for fiscal prudence loosens, not least given that public employment and wages tend to follow lagged pro-cyclical patterns, as pointed out by the available literature (see e.g. Lamo, Pérez, and Schuknecht, 2013a).

As regards public wage containment, historical experience shows that catching-up processes in good economic times tend to partially or completely cancel out crisis-related budgetary savings. As regards public employment, analysis based on micro data shows that, in many countries, a significant portion of the reduction depended on workers with temporary contracts. Thus, the employment adjustment was more of a cyclical-like reaction than a permanent reduction. Additional margins of short-term adjustment include the moderation of high public-to-private wages ratios (the “wage gap”).

Moreover, many countries have recently embarked on fiscal-structural reforms, geared towards increasing efficiency in the public sector, which in turn are likely to support the public wage moderation achieved and help to counteract the risks of policy reversal.

Overall, further adjustment of the government wage bill has to be designed carefully and with regard to country-specific circumstances. Margins for possible further public wage and employment retrenchment have to take into account the particular country-related conditions. This includes the consolidation effort and structural reforms already accomplished, and the efficient provision of public goods and services, including the preservation of a high level of human capital.

# References


Afonso, A. and P. Gomes (2008), "Interactions between private and public sector wages", ECB Working Paper, No. 971.

Afonso, A. and J. González-Alegre (2011), "Economic growth and budgetary components: a panel assessment for the EU", *Empirical Economics*, Vol. 41, Issue 3, pp. 703-723.

Alesina, A., S. Ardagna, R. Perotti and F. Schiantarelli (2002), "Fiscal policy, profits and investment", *American Economic Review*, Vol. 92, No. 3, pp. 571-589.

Algan, Y., P. Cahuc, and A. Zylberberg (2002), "Public employment: Does it increase unemployment?", *Economic Policy*, Vol. 17, Issue 34, pp. 7-65.

Borjas, B. (1993), "The Wage Structure and the Sorting of Workers into the Public Sector", NBER Working Paper, No. 9313.

Bouthevillain, C., J. Caruana, C. Checherita, J. Cunha, E. Gordo, S. Haroutunian, A. Hubic, G. Langenus, B. Manzke, J.J. Pérez, and P. Tommasino (2009), "Pros and cons of various fiscal measures to stimulate the economy", Banco de España*, Economic Bulletin*, July, pp. 125-144.

Campos, M., D. Depalo, E. Papapetrou, J.J. Pérez, and R. Ramos (2015), "Understanding the public sector pay gap", Banco de España Working Paper, No. 1539.

Celov, D. (2015), "LEMPA – a Quarterly Lithuanian Economy Model for Projections and Analysis", Mimeo.

de Castro, F., M. Salto, and H. Steiner (2013), "The gap between public and private wages: new evidence for the EU*", European Economy  Economic Papers*, No. 508.

Depalo, D., R. Giordano, and E. Papapetrou (2015), "Public-private wage differentials in euro area countries: evidence from quantile decomposition analysis", *Empirical Economics*, forthcoming.

Dos Reis, A.C. and E. Zilberman (2014), "The insurance role of public employment", *Mimeo*.

Economides, G., A, Philippopoulos, and V. Vassilatos (2015a), "Incentives to work and performance in the public sector", CESIFO Working Paper, No. 5193.

Economides, G., A, Philippopoulos, and V. Vassilatos (2015b), "Public, or private, providers of public goods? A dynamic general equilibrium study", *European Journal of Political Economy*, forthcoming.

Eurofound (2015), "*ERM Annual report 2014: Restructuring in the public sector"*, Publications Office of the European Union, Luxembourg.

European Commission (2014), “Government wages and labour market outcomes”, DG ECFIN, European Economy Occasional Paper, No. 190.

Fagan, G., J. Henry and R. Mestre (2005), “An area-wide model (AWM) for the euro area”, *Economic Modelling*, Vol. 22, No.1, pp. 39-59.

Fernández-de-Córdoba, G., J.J. Pérez, and J.L. Torres (2012), “On the substitutability between public and private employment”, *Economics Bulletin*, Vol. 32, pp. 2700-2709.

Fiorito, R. and T. Kollintzas (2004), "Public Goods, Merit Goods, and the Relation between Private and Government Consumption", *European Economic Review,* Vol. 48, pp. 1367-1398.

Forni, L. and N. Novta (2014), “Public employment and compensation reform during times of fiscal consolidation”, IMF Working Paper, No. 14/192.

García-Rodríguez, A. (2015), “The public wage channel on the post-EMU loss of competitiveness in Southern Europe”, European University Institute, Mimeo.

Giordano, R., D. Depalo, M. Coutinho Pereira, B. Eugène, E. Papapetrou, J.J. Pérez, L. Reiss, and M. Roter (2015), “The public sector pay gap in a selection of euro area countries in the pre-crisis period”, *Hacienda Pública Española – Review of Public Economics*, 214, pp. 11-34 (previous version: ECB Working Paper*,* No. 1407).

Gomes, P. (2014), “Heterogeneity and the public sector wage policy”, Universidad Carlos III de Madrid, Mimeo.

Hernández de Cos, P. and E. Moral-Benito (2016), “The role of public wages in fiscal consolidation processes”, paper presented at the workshop *“Government wage bill: determinants, interactions and effects”,* DG ECFIN, European Commission. Forthcoming.

Holm-Hadulla, F., K. Kamath, A. Lamo, J.J. Pérez, and L. Schuknecht (2010), “Public wages in the euro area; towards securing stability and competitiveness”, ECB Occasional Paper, No. 112.

Holmlund, B. (1997), “Macroeconomic implications of cash limits in the public sector”, *Economica*, Vol. 64, pp. 49–62.

Hurtado, S., P. Manzano, E. Ortega, and A. Urtasun (2014), "Update and re-estimation of the quarterly model of Banco de España (MTBE)", Banco de España Occasional Paper, No. 1403.

International Monetary Fund (2015), “Fiscal policy and long-term growth”, IMF Policy Paper, June.

Kollintzas, T., D. Papageorgiou, and V. Vassilatos (2015), “A model of market and political power interactions for southern Europe”, CEPR Discussion Paper, No. 10359.

Kopelman, J.L. and H.S. Rosen (2016), " Are Public Sector Jobs Recession-proof? Were They Ever?", *Public Finance Review*, Vol. 44, No. 3, pp. 370-396.

Lamo, A., E. Moral-Benito, and J.J. Pérez (2016), "Does slack influence public and private labour market interactions?", ECB Working Paper, No. 1890.

Lamo, A., J.J. Pérez, and A.J. Sánchez-Fuentes (2013), "Institutional determinants of public-private sector wages' linkages", *Applied Economics Letters*, Vol. 20, pp. 1165–1169.

Lamo, A., J.J. Pérez, and L. Schuknecht (2012), "Public or private sector wage leadership? An international perspective", *Scandinavian Journal of Economics*, 144, pp. 228-244.

Lamo, A., J.J. Pérez, and L. Schuknecht (2013a), "The cyclicality of consumption, wages and employment of the public sector in the euro area", *Applied Economics*, Vol. 45, pp. 1551–1569.

Lamo, A., J.J. Pérez, and L. Schuknecht (2013b), "Are government wages interlinked with private sector wages?", *Journal of Policy Modeling*, Vol. 35, No. 5, pp. 697-712.

Lindquist, M.J. and R. Vilhelmsson (2006), "Is the Swedish Central Government a Wage Leader?", *Applied Economics*, Vol. 38, pp. 1617-1625.

Maley, J. and T. Moutos (1996), "Does government employment 'crowd-out' private employment? Evidence from Sweden", *Scandinavian Journal of Economics*, Vol. 98, No. 2, pp. 289-302.

Marzinotto, B. and A. Turrini (2016), "Co-movements between Public and Private Wages in the EU: Which Factors Play a Role?", IZA Discussion Paper No. 9964.

Michaillat, P. (2014), "A theory of countercyclical government multiplier", *American Economic Journal Macroeconomics*, Vol 6, No.1, pp. 190-217.

Montesinos, A., J.J. Pérez, and R. Ramos (2015), "Changes in the structure and composition of public-sector employment during the crisis", SEFO, FUNCAS, November.

Paredes, J., D.J. Pedregal, and J.J. Pérez (2014), "Fiscal policy analysis in the euro area: expanding the toolkit", *Journal of Policy Modelling*, Vol. 36, pp. 800-823.

Pérez, J.J. and A.J. Sánchez (2011), "Is there a signalling role for public wages? Evidence for the euro area based on macro data", *Empirical Economics*, Vol. 41, No. 2, pp. 421–445.

Rodik, D. (2000), "What drives public employment in developing countries?", *Review of Development Economics*, Vol. 4, Issue 3, pp. 229-243.

Stepanyan, A. and L. Leigh (2015), "Fiscal policy implications for labor market outcomes in middle-income countries", IMF Working Paper, No. 15/17.

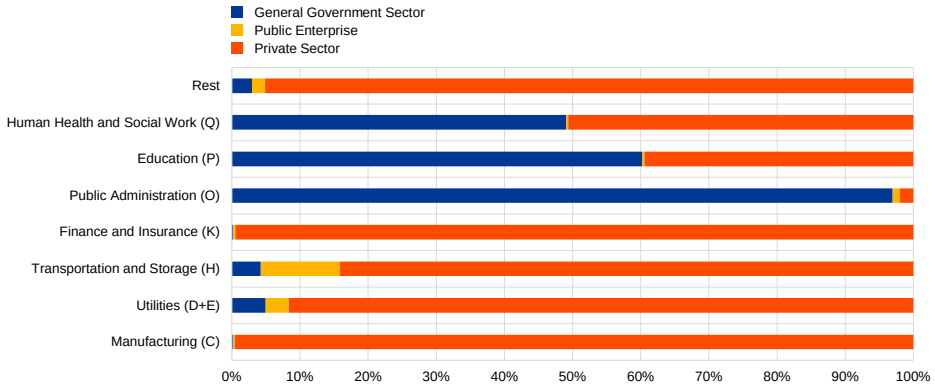
Ujhelyi, G. (2014), “Civil service reform”, *Journal of Public Economics*, Vol. 118, pp. 15-25.

# Appendix I
# Definitions and data used

In advanced OECD economies, the government is widely involved in the provision of welfare services (mainly health and education) and utilities. This means that its presence in the economy goes well beyond the provision of pure public goods and services. The specific form of the provision of welfare services varies significantly across countries, i.e. whether it consists of direct service delivery, partial delivery and/or partial/full subsidisation of consumption. These alternatives imply a different role for non-governmental organisations, and thus translate into significant heterogeneity across countries in the number of public sector employees in those sectors.

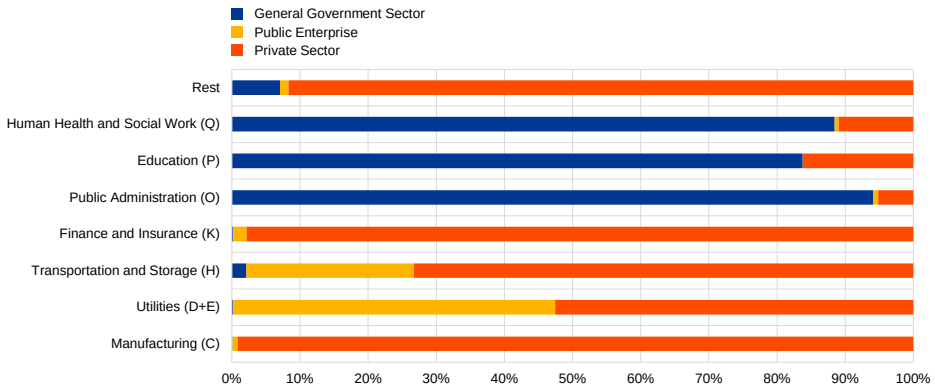
## Distribution of employment by sector: Spain and Denmark

### Spain




Source: Labour force Survey (INE).

### Denmark




Source: Danmarks Statistik.

For a cross-country study, it is important to acknowledge upfront that it is very difficult to delineate the precise nature of the public sector. For example, according

to Eurofound (2015) services in the health systems in Germany, France and the Benelux countries, while largely state-funded, are provided mainly by private sector companies or mixed-ownership organisations. The heterogeneity in the direct involvement of the public sector in the different sectors of the economy might be illustrated by considering the distribution of employees in the general government, public enterprises and the private sector (for the cases of Denmark and Spain and, to some extent, France). In Denmark the number of general government employees in the health and education sectors is close to 90% and more than 80%, respectively. In contrast, in Spain the percentages are about 50% and 60%, respectively. In addition, the involvement of the public sector (directly or via public enterprises) in the transportation and storage and utilities sectors is quite different between the two countries. It is worth mentioning that the selection of just a few countries is not only for the sake of brevity, but mainly due to difficulties in finding publicly available, cross-country homogeneous datasets on which to base a broader analysis.

In this regard, in order to analyse the activity of the government as an employer, it is necessary to make use of different partial data sources, as no single source guarantees comprehensive coverage of the total number of public employees in terms of institutional sector coverage, characteristics (including wages), and homogeneity of definitions.

As regards macro (aggregate) data, the focus is on the general government sector (S.13) as defined in National Accounts (ESA2010) for all current EU Member States (EU-28, where possible). The primary source of government wage bill data and all macroeconomic variables used through the study (GDP, prices, total economy wages and employment, population) is Eurostat for European Union (EU) countries and the OECD (Economic Outlook Database) for non-EU countries. General government employment data, in turn, have been provided by the Eurosystem National Central Banks, even though in a majority of cases the primary data source is Eurostat. For non-EU countries, OECD data is used. The pre-1995 series of euro area aggregates is taken from the ECB's Area Wide Model Database (see Fagan, Henry and Mestre, 2005); the fiscal block of this database is taken from Paredes, Pedregal and Pérez (2014). While the choice of macro data sources and definitions ensures the best available degree of harmonisation and comparability, there are however measurement problems both within and across countries. Differences/changes in working hours, privatisation, differences/changes in the size of the public sector over time, or changes in the skill composition of the labour force over time might distort the view on certain issues.

The measure of aggregate wages chosen for the analysis is compensation per employee in nominal terms (instead of wages), owing to data limitations in terms of sample size and coverage of countries in the sample. Compensation per employee is computed using compensation of employees and employment data. Compensation of private sector employees is defined as total economy compensation of employees minus compensation of government employees. Compensation per private employee is defined as private compensation of

employees divided by private sector employment minus government employment minus self-employment.

OECD and Eurostat data on the Classification of the Functions of Government (COFOG) is also used. This makes it possible to analyse the general government sector wage bill expenditure broken down into individual and collective goods and services. Individual services ("merit goods", see e.g. Fiorito and Kollintzas, 2004), are characterised by the fact that they can also be provided privately, such as health, education and other services, while collective goods (traditional "public goods") are non-rival substitutes for private consumption. In particular, we proxy individual services by aggregating the functions of health, education and social protection, and collective services by aggregating the remaining seven COFOG categories, namely general services, defence, public order and safety, economic affairs, environment, housing, and recreation.

As regards sources of micro data, the selected database is the European Union Statistics on Income and Living Conditions (EU-SILC) survey, given its cross-country comparability, data availability for the pre- and post-crisis periods, and the fact that it covers most European Union countries (all with the exception of Finland, Malta, Bulgaria and Croatia), as well as Norway and Iceland. The distinction between public and private sector employment is based on NACE (Statistical Classification of Economic Activities), Rev.2. The most recent data refers to the 2013 EU-SILC wave, which includes employment and earnings information pertaining to 2012. In this framework, as it is standard in the literature, the "government sector" will be an approximation based on either the aggregation of the O (Public Administration and Defence, Compulsory Social Security), P (Education) and Q (Health and social work) sectors of the NACE classification (broad definition), or only the O sector (restricted definition). With the EU-SILC database it is not possible to separate public employees from private sector employees in any of the sectors. This means that to construct the proxy, all the employees in these sectors are assigned to the "public sector". This might be particularly relevant for activities P and Q, where private sector providers are more prevalent. In the case of EU-SILC data the definition of "wages per employee" is computed based on the individual gross monthly earnings (including only monetary earnings and excluding financial income from investments, assets, savings, stocks and shares) before netting out taxes and social contributions, and the number of hours worked per week in the main job. It must be stressed that in this study data limitations prevent us to control for a number of factors: fringe benefits, pension rights, job security. Finally, the data selected do not allow to control for the same selection bias due to the possibility that the sorting of employees among sectors is not random, but occurs on the basis of unobserved characteristics.

# Appendix II
# Deepening the understanding of public-private pay differentials

In advanced OECD economies the government is widely involved in the provision of welfare services (mainly health and education) and utilities, i.e. its presence in the economy goes well beyond the provision of traditional public goods and services. The specific form of the provision of the former varies significantly across countries, in particular as regards the type of provision, i.e. whether it consist of direct service delivery, partial delivery and/or partial/full subsidisation of consumption. These alternatives involve a different role for non-governmental organisations, and thus translate into significant heterogeneity across countries in the number of public sector employees in those sectors.

A number of reasons for the existence of public-private wage differentials have been advanced in the literature on the subject. For example, starting from the observation that wage premiums tend to be higher in countries with a lower share of government employment as a proportion of total employment in the economy, some authors develop models in which a smaller group of public employees derive monopoly power from a tighter control of the production of public goods/services (see e.g. Fernández-de-Córdoba, Pérez and Torres, 2012a; EC, 2014; Kollintzas, Papageorgiou, and Vassilatos, 2015). On related grounds, it is argued that a wage premium arises because of differences in the bargaining power of private and public sector workers (Holmlund, 1997). Other explanations are linked to countries' degree of fiscal decentralisation. In this regard it has been argued that public expenditure decentralisation tends to be related to the presence of higher overall public wage premiums, because of common pool problems (in the case of highly decentralised countries) and when government wages are set in a homogeneous way in the country (in the case of more centralised countries). In addition, some recent evidence signals that the public-private wage premium may be related to employment protection legislation, possibly because higher compensations are needed to make public employment attractive when private employment is more strongly protected (see EC, 2014). More fundamentally, the heterogeneity of the premium may also be linked to the degree of substitutability between publicly provided goods and services and private activity. Simple correlation analysis shows that the higher the degree of substitutability, the lower the wage premium.

Despite the rich set of theories rationalising the existence of a public pay premium, there is a limited amount of research providing cross country comparisons of public-private pay differentials, see e.g. Giordano et al. (2015) or de Castro et al. (2013). An exception is Campos et al. (2015), who provide a structured and comprehensive analysis of the factors outlined above, and analyse the changes in the gap during the financial crisis and in the long-run.

This paper estimates for a set of 25 (mostly) EU countries for 2004-2012 the part of the wage gap that remains unexplained once (observable) individual characteristics are controlled for. Unfortunately, the data available are not enough to provide a full understanding of the mechanism of sorting between the public and private sector on the basis of factors such as fringe benefits, job security or pension schemes. Moreover, it is also not possible to control for self-selection effects determined by the unobservable characteristics of the individuals (such as preferences). Despite these drawbacks, the analysis of EU-SILC data allows the identification of several relevant differences between public and private sector workers. They follow the common approach of running Mincer-type wage regressions taking the logarithm of gross income per hour as the dependent variable, ($y$). The set of covariates ($X$) includes binary variables denoting married status, low and high education, managerial position, part-time job and female, year and region-related effects, as well as experience and a second degree polynomial in experience (or age and age squared whenever information on experience is not available). The specification also includes a binary variable ($public$) denoting that individual $i$ works in one of the industries taken as a proxy for the public sector (Public Administration, health and education). Equation (1) clarifies the specification.

$$y_i = \alpha + X_i' \beta + Public_i \ \delta + \varepsilon_i, \qquad (I.1)$$

Thus, as per the usual approach, the coefficient associated with the category of public worker ($\delta$) represents the earnings differential (evaluated at the mean of the distribution) that remains once the other relevant determinants are controlled for and, if estimated to be positive, it is labelled public-private wage differential/premium/gap (or wage penalty if negative).

Campos et al. (2015) document large cross-country differences in the estimated public-private wage premium (from -13.5% in Norway to 39% in Cyprus). They also find that that more than half of the cross-sectional variation in wage gaps can be accounted for by variables linked to non-competitive wage settlements in the public sector, whereas different labour market institutions in the public vs. the private sector have less explanatory power. By looking at long-term trends (1970-2014) using national accounts data, they also find that openness to international competition and improvements in the institutional quality of governments have been associated with decreases in the public-private wage gap.

With regard to the financial crisis, a significant narrowing of wage gaps has been documented across European countries, this process being mainly associated with the widespread fiscal consolidation needs, rather than structural factors such as those explaining the pay gap differences in the cross-section.

# Appendix IIIa
# Policy measures implemented during the crisis with a direct impact on the general government sector wage bill

| | Year | Wage measure | Staff measure | Reasons | Other comments |
|---|---|---|---|---|---|
| | | | **Euro area countries** | | |
| **AT** | 1996–1997 | wage freeze | | fiscal consolidation | |
| | 1998–2000 | wage increase (above past inflation) | | | partial compensation for losses incurred in 1996/97 |
| | 2002 | wage increase (below past inflation) | | fiscal consolidation | |
| | 2013 | wage freeze | | fiscal consolidation | |
| **BE** | 1982–1986 | freeze in wage indexation; wage freeze | | fiscal consolidation | |
| | 1984–1986 | | employment freeze (partial) | fiscal consolidation | |
| | 1992 | wage increase | | | |
| | 1994 | wage indexation (new regulations) | | fiscal consolidation | health index |
| | 1994 | | abrogation of compulsory military service | | |
| | 2012–2013 | freeze in wage indexation; wage freeze | | | federal budget control march 2012, federal budget 2013 |
| **CY** | 2009 | | employment increase | | |
| | 2010 | | employment cut | | |
| | 2011–2012 | wage cut; wage freeze | | | |
| | 2013–2014 | wage cut; wage freeze; other savings | | | |
| **DE** | During 1990s | | employment cut (local gov. and east german states) | unification of germany | |
| | 1990–2010 | wage increase (stepwise adjustment of wages in east german states to west german levels) | | unification of germany | |
| | 1990–2009 | increase in working hours (without wage adjustment) | | fiscal consolidation | reverse in recent years |
| | 2009–2010 | | employment increase (special case) | part of fiscal package in economic and financial crisis | additional temporary staff for employment agency |
| **EE** | 2008–2010 | wage cut; wage freeze | employment cut; employment freeze | fiscal consolidation | budgets, supplementary budgets |
| | 2011–2012 | wage freeze | employment freeze | fiscal consolidation | budgets, supplementary budgets |
| **ES** | 1993–1994 | wage freeze | hiring freeze (with few exceptions) | fiscal consolidation | |
| | 1995–1996 | | replacement rate | fiscal consolidation/ public sector downsizing | |
| | 1997 | wage freeze | | fiscal consolidation | |
| | 1997–2001 | | limits to the replacement rate (with some exceptions) | fiscal consolidation / public sector downsizing | |
| | 2007–2009 | wage increase (certain groups) | | | budget laws |
| | 2009–2014 | | limits to replacement rate | fiscal consolidation | budget laws |
| | 2010 | wage cut | | fiscal consolidation | royal decree-law 8/2010 |
| | 2011–2014 | wage freeze | | fiscal consolidation | budget laws |
| | 2012 | changes to compensation during temporary incapacity and union licenses; | increase in working hours | fiscal consolidation | royal decree-laws 20/2012, 20/2011 |

| | | | | | |
|---|---|---|---|---|---|
| | | one-off elimination of one extra payment (december) | | | |
| | 2012–2014 | wage cut (regional level) | hiring freeze | fiscal consolidation | budget laws |
| | 2015 | one-off partial cash devolution of 2012 extra payment | | | budget laws |
| **FI** | 1992–1994 | possibility to replace monetary holiday bonuses for additional vacation | employment cut (local government) | fiscal consolidation and cuts in central government transfers to local government | |
| | 1992–1993 | wage freeze | | | in accordance to collective agreements |
| | 1994 | | increase in working hours | fiscal consolidation | |
| **FR** | 1996 | freeze in wage indexation | | | |
| | 2003 | freeze in wage indexation | | | |
| | 2007–2012 | | replacement rate | government modernisation, reduction of spending | |
| | 2011–2014 | freeze in wage indexation | | fiscal consolidation | |
| **GR** | 1978–1980 | | employment freeze | fiscal consolidation | since may 1978 |
| | 1982 | wage increase (certain groups); wage indexation | | Income redistribution | Introduction of ATA (ex post automatic wage indexation) |
| | 1983 | partial deference of wage indexation; wage freeze | | effort to check the increase in ULC | law 1320/1983; ATA |
| | 1984–1985 | wage indexation | | | ATA |
| | 1986–1987 | wage freeze; (revision of) wage indexation (rules) | | balance of payments crisis | revision of ATA (from ex post to ex ante wage indexation); Laws 1584,1589, 1986 |
| | 1988–1989 | wage increase; (revision of) wage indexation (rules) | | | revision of ATA, law 1836/1989 |
| | 1990 | deduction in wage increase; (revision of) wage indexation (rules) | | fiscal consolidation | laws 1874/1990, 1884/1990 |
| | 1991 | wage increase; (revision of) wage indexation (rules) | | | ATA abolishment |
| | Year | wage measure | staff measure | reasons | other comments |
| **GR** | 1992 | wage freeze (with some exceptions) | | | laws 2025/1992, 2019/1992 |
| | 1993–1994 | wage increase; wage indexation | | | laws 2129/1993, 2198/1994 |
| | 1995–1999 | wage increase; wage indexation | restrictions on hiring | convergence program 1994–1999 | laws 2297/1995, 2399/1996, 2470/1997, 2606/1998, 2448/1996, 2521/1997, 2530/1997, 2469/1997, 2702/1999; restrictions on hiring 1998 |
| | 2000–2007 | wage increase | | | laws 2768/1999, 2873/2000, 3016/2002, 3156/2003, 3205/2003, 3356/2005, 3356/2005 |
| | 2008–2009 | wage increase (certain groups), wage freeze | | | |
| | 2010–2014 | wage cut; other measures; wage increase (certain groups) | employment cut; restrictions on hiring | | Laws 3812/2009; 3833/2010, 3845/2010( (MoU/2.2011), 4002/2011, MTFS, budgets , others |
| **IR** | 1988–2000 | wage increase | | | 1988–1990 program for national recovery<br>1991–1993 program for economic and social progress<br>1994–1996 program for economic and social progress<br>1997–2000 partnership 2000 |
| | 2001–2006 | wage increase | | | 2001–2003 program for prosperity and fairness<br>2004–2006 sustaining progress |
| | 2009–2011 | wage cut | | | supplementary budget 2009; budget 2010, budget 2011 |
| | 2012–2014 | wage cut | | | budget 2012, MTFS/Ec fiscal |

| | | | | | |
|---|---|---|---|---|---|
| | | | | | Outlook; Croke Park II Haddington Rd, MTFS |
| **IT** | 2001–2003 | pension (two) reforms | | tax harmonization | |
| | 2002 | wage increase | | | |
| | 2004–2006 | wage increase | | | process started in 2004 |
| | 2006–2007 | wage increase | | | process for 2006/2007 |
| | 2008–2009 | wage increase | | | process for 2008/2009 |
| | 2010–2012 | wage freeze (wage cut certain groups); stop renewal of contracts | stop turn over | fiscal consolidation | process for 2010–2012 law 78/2010 |
| | 2013–2014 | wage freeze (wage cut certain groups); stop renewal of contracts | | fiscal consolidation | extension of provisions of 2010 to 2014 |
| **LU** | 1986–1987 | wage increase | | | |
| | 1990 | wage increase | | | |
| | 1995–2006 | wage increase | | | |
| | 2007 | wage increase | | | |
| | 2009 | wage increase | | | |
| | 2010 | wage increase (certain groups) | | | |
| | 2011 | | employment freeze | | |
| **LT** | 1994–2014 | increase in minimum wages | | | |
| | 2010 | wage reduction | | economic and financial crisis | |
| | 2013–2014 | wage increase | | | partially due to constitutional court decision |
| **LV** | 2007–2009 | increase in minimum wages | | | |
| | 2009–2010 | wage cut | | | |
| **PT** | 2002 | | replacement rate | fiscal consolidation | |
| | 2003 | wage freeze (automatic career progressions and reclassifications) | | fiscal consolidation | |
| | 2003–2004 | wage freeze | | fiscal consolidation | |
| | 2006 | wage freeze (automatic career progressions and reclassifications) | replacement rate | fiscal consolidation | Staff measures: under the scope of prace: central government restructuring programme |
| | 2007 | wage freeze | | | |
| | 2011-2014 | wage cut | | | |
| | 2013 | hours worked adjustment | | | |
| **SI** | 1995–2000 | wage increase (below past inflation) | | macroeconomic stability | |
| | 2000–2001 | wage increase (certain groups) | | | |
| | 2001–2002 | wage increase (below private sector wage increase) | | | |
| | 2004–2005 | wage indexation (in accordance to inflation; new regulations) | | | Programme for effective Integration into the EU (July 2003); planned implementation of the new payment system |
| | 2006–2008 | wage increase (below past inflation) | | | 2006–2007 planned implementation of the new payment system; 2008–2009 introduction of the new payment system |
| | 2009–2011 | wage increase (below past inflation); wage freeze | | fiscal consolidation | |
| | 2012 | wage increase (below past inflation); wage cut | replacement rate | new payment system, fiscal consolidation | New payment system for wage adjustment |
| | 2013–2014 | wage cut | | fiscal consolidation | |
| **SK** | 2001 – 2006 | | employment cut | improving local accessibility and efficiency of public administration | |
| | 2011 | wage cut | employment cut | fiscal consolidation | |

| | | | | | |
|---|---|---|---|---|---|
| | 2012 | wage freeze | | fiscal consolidation | |
| | Year | wage measure | staff measure | reasons | Other comments |
| | | | **Non–euro area countries** | | |
| **BG** | 2010 | wage freeze (indexation) | Employment cut | | |
| | 2011–2012 | wage freeze (indexation); increase in minimum wages | | | |
| | 2013–2014 | increase in minimum wages | | | |
| **CZ** | 2008 | wage growth reduction | | 2008 stabilization reform of public finance | |
| | 2009 | wage increase | | 2009 stimulus package | |
| | 2011 | wage increase (certain groups) | | 2011 consolidation package | |
| | 2010–2012 | wage freeze | | 2010 austerity package | |
| | 2011–2012 | wage cut | | 2011 consolidation package | |
| **DK** | 1982 | wage increase (automatic indexation) | | inflation | First suspended and later abolished permanently in 1986. |
| **HR** | 1994 | wage freeze | | | |
| | 1998–1999 | wage increase | | | |
| | 2000–2001 | wage decrease | | fiscal consolidation | |
| | 2003 | | employment cut | fiscal consolidation | |
| | 2007–2012 | wage increase | | | Agreement of 2006 |
| **HR** | 2009–2010 | wage cut | | fiscal consolidation | |
| **HU** | 2007–2008 | control of wage growth | employment cut | | |
| **PL** | 2002–2003 | wage freeze | | fiscal consolidation | |
| | 2006 | wage increase (certain groups) | | wage pressure | |
| | 2007 | wage freeze | | reduction of social security contribution rate paid by employees | |
| | 2007–2009 | wage increase (certain groups) | | | programme for years 2007-2009 (modernisation of uniformed services) |
| | 2008–2012 | wage increase (certain groups) | | | |
| | 2010 | wage freeze | | fiscal consolidation | |
| | 2011 | wage cut (certain groups) | | fiscal consolidation | |
| | 2011–2014 | wage freeze (certain groups) | | fiscal consolidation | |
| | 2013–2014 | wage increase (certain groups) | | | |
| **RO** | 2009 | wage cut | | | |
| | 2012 | wage freeze | | | |
| | 2013 | wage increase | | | |
| | 2014 | near–freeze in public wages | | | |

Source: European System of Central Banks

# Appendix IIIb
# Significant structural policy actions with a direct impact on the general government sector wage bill implemented by EU countries

| Country | Measure | Description |
|---|---|---|
| | **Historical episodes: 1980-2008** | |
| **Belgium** | copernicus plan (1999-2004) | new organizational structure, new management culture, new HRM policy |
| **Germany** | federalism reform i (2006) | devolution of legislation and remuneration for civil servants to individual state governments --> more efficient allocation of competences across gov. levels |
| **Greece** | 1988; 1997; 2003-2004 | 1988: public sector employees governed by private-law contracts; establishment of an "unified pay scale" of the civil service<br>1997:new pay scale<br>2003-2004: extension of part-time employment opportunities (non-permanent) to the public sector |
| **Ireland** | 1988-1990 | introduction of social partnership |
| **Italy** | privatisation of the public sector (1993) | staff regulations in the public sector determined by a collective bargaining system (as in the private sector): augment labour mobility, including the right to lay off public employees.<br>introduction of performance-related pay |
| **Portugal** | restructuring of state central administration programme (prace) (2005-2009) | aim: reorganise central government in order to cut costs and raise efficiency (restructuring of ministries and regionalised services) including : mobility regime, introduction of performance assessment mechanisms, the social protection reform, the new legal employment, career system and pay scales law (labour legislation closer the private sector) |
| **Portugal** | 2006 | increase in the minimal retirement age and years of service for public employees, as part of the convergence towards the general social security regime. |
| **Slovenia** | 2001-2002; 2003 | 2001-2002: separate agreement for public and private sector (adjustment of wages in private and public sector could differ).<br>2003: the adjustment of the basic wage was replaced with a pension insurance premium;<br>new payment system |
| **United Kingdom** | new public management (1994, comprehensive spending review 2007) | outsourcing non-core functions, establishment of executive agencies<br>performance pay (which links part of a public servant's salary to his annual performance |
| | **Current episodes: 2008-2017** | |
| **Cyprus** | public administration reform 2013 | reforms of public administration to improve its functioning and cost-effectiveness improving the efficiency of state-owned and semi-public enterprises, scaled wage cuts, streamlining of allowances, further horizontal wage cuts, income contribution to health care, reform of pension schemes. |
| **Estonia** | new public service act (2012) 2013 | new public remuneration system (drop of the central salary scales, reduction of wage components)<br>2013: reclassification of a large transport service company into the general government sector |
| **France** | general review of public policies (RGPP) (2009-2012) / spending reviews | replacement of only1/2 of retiring employees (2007-2012) / spending review on the general government secor and publicly-owned companies (ongoing since end-2014) |
| **Greece** | public administration reform 2009-2013 | reorganising local and central government<br>tighter rules for temporary staff, cancellation of vacant job post and reallocation of qualified staff to priority areas<br>extension of working hours in the public sector<br>rationalising the public remuneration system: the single payment authority (SPA)'s, which will allow for a more effective coverage, assessment and payment of employees/new wage grid |
| **Ireland** | public administration reform 2009-2013 | reorganising local and central government<br>rationalising the public remuneration system<br>introduction cross public sector measures, including greater use of shared services and information technology solutions, reform of public procurement processes, regular comprehensive expenditure reviews and using new business models for service delivery |
| **Italy** | 2009-2013 | more flexibility in labour organization<br>introduction of an evaluation system and performance's reward |
| **Portugal** | program "reduction and improvement of central administration plan" premac (2010-2013) | increase in public sector working time (from 35 to 40 hours in september 2013) reorganising local and central government --> the plan established a reduction of 40% of central administration high level structures, 27% of the hierarchical levels and optimisation of staff numbers. |

| | | |
|---|---|---|
| | | 2009 new single pay scheme (linked to individual performance/except in time of wage freezing) |
| **Romania** | public administration reform 2010-2013 | new public pay system (ratio between the national minimum wage and the maximum salary in the public sector, rules to govern pay rises, new pay grid…) |
| **Spain** | public administration reform 2012-2017 | restructuring and rationalisation of public sector companies and foundations.<br>limitations to staff of municipalities: linked to population and set with reference to central government reference salaries (2014)<br>increase flexibility in public employment (internal mobility and firing conditions) (2014-2017) |

Source: European System of Central Banks

**Acknowledgements**
We would like to thank Iñigo Arruga, Stephen Byrne, José Mª Casado, Pablo Hernández de Cos, Hans-Joachim Klöckers, Jana Kremer, Francisco Martí, Doris Prammer, Lukas Reiss, I. Sampethai, Rita Schembri, Dan Stegarescu, Stefan Van Parys, Thomas Warmedinger, and the colleagues from the ESCB NCBs of Croatia, the Czech Republic, Luxembourg, Poland, Slovenia, Denmark, Estonia, Finland, and Slovakia for their comments and help with different aspects of the data. We also thank members of the ESCB Working Group on Public Finance for their useful comments and discussions, and Stephanie Jetten, Max Freier, Sebastian Hauptmeier, and Ad van Riet for their help.

This paper was drafted by a team of staff from the European System of Central Banks, led by Javier J. Pérez.

**Javier J. Pérez (coordinador)**
Banco de Espana, Madrid, Spain; email: javierperez@bde.es

**Marie Aouriri**
Banque de France, Paris, France; email: marie.aouriri@banque-france.fr

**Dmitrij Celov**
Bank of Lithuania, Vilnius, Lithuania; email: dcelov@lb.lt

**Maria M. Campos**
Banco de Portugal, Lisboa, Portugal; email: maria.manuel.campos@bportugal.pt

**Domenico Depalo**
Banca d'Italia, Rome, Italy; email: domenico.depalo@bancaditalia.it

**Evangelia Papapetrou**
Bank of Greece; email: epapapetrou@bankofgreece.gr

**Jurga Pesliakaite**
Bank of Lithuania, Vilnius, Lithuania; email: jpesliakaite@lb.lt

**Roberto Ramos Magdaleno**
Banco de Espana Madrid, Spain; email: roberto.ramos@bde.es

**Marta Rodríguez-Vives**
European Central Bank, Frankfurt, Germany; email: marta.rodriguez@ecb.int



| | |
|---|---|
| Postal address | 60640 Frankfurt am Main, Germany |
| Telephone | +49 69 1344 0 |
| Website | www.ecb.europa.eu |



| | |
|---|---|
| ISSN | 1725-6534 (online) |
| ISBN | 978-92-899-2339-2 |
| DOI | 10.2866/551055 |
| EU catalogue No | QB-AQ-16-009-EN-N |