

Zwysen, Wouter; Drahokoupil, Jan

Working Paper

Are collective agreements losing their bite? Collective bargaining and pay premia in Europe, 2002-2018

Working Paper, No. 2022.07

Provided in Cooperation with:

European Trade Union Institute (ETUI), Brussels

Suggested Citation: Zwysen, Wouter; Drahokoupil, Jan (2022) : Are collective agreements losing their bite? Collective bargaining and pay premia in Europe, 2002-2018, Working Paper, No. 2022.07, European Trade Union Institute (ETUI), Brussels

This Version is available at:

<https://hdl.handle.net/10419/299842>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.

Are collective agreements losing their bite?

Collective bargaining and pay premia in Europe, 2002-2018

Wouter Zwysen and Jan Drahokoupil

Working Paper 2022.07

etui.

Are collective agreements losing their bite?

Collective bargaining and pay premia in Europe, 2002-2018

Wouter Zwysen and Jan Drahokoupil

Working Paper 2022.07
european trade union institute

Wouter Zwysen is a senior researcher at the European Trade Union Institute (ETUI) in Brussels, Belgium. Contact: wzwysen@etui.org

Jan Drahokoupil is a senior researcher at the European Trade Union Institute (ETUI) in Brussels, Belgium.

ETUI publications are published to elicit comment and to encourage debate. The views expressed are those of the author(s) alone and do not necessarily represent the views of the ETUI nor those of the members of its general assembly.

Brussels, 2022
© Publisher: ETUI aisbl, Brussels
All rights reserved
Print: ETUI Printshop, Brussels

D/2022/10.574/11
ISSN: 1994-4446 (print version)
ISSN: 1994-4454 (electronic version)



The ETUI is financially supported by the European Union. The European Union is not responsible for any use made of the information contained in this publication.

Table of contents

Abstract	4
Introduction	5
1. Data and methods	8
2. Collective bargaining in Europe at a glance	11
3. Trends in coverage and pay premia from micro-level data	16
3.1 Centralisation and coverage in the public and private sectors.....	16
3.2 Variation in pay premia in the private sector.....	20
3.3 Patterns in coverage and pay premia by type of collective bargaining regime.....	22
3.4 Country differences	24
4. What explains the differences in pay premia? Analysis of country-sector-years	28
Conclusion	33
References	34
Appendix.....	36
Appendix A: Country profiles	37
Appendix B: Methodological extension.....	48
Appendix C: Coverage between ESES and ICTWSS.....	50
Appendix D: Comparison of SES micro-level and aggregate data.....	52

Abstract

This paper describes the evolution of collective bargaining coverage in European countries during 2002-2018 and links it to changes in the evolution of the pay premia received by workers covered by collective bargaining. It uses evidence from the European Structure of Earnings Survey (ESES) to map developments in 28 European countries. We analyse collective bargaining coverage through multi-employer and firm-level agreements as well as the premia associated with being covered by agreements at different levels. In order to identify the key differences and trends in the industrial relations system, we analyse collective bargaining in publicly and privately owned companies separately. We also investigate the extent to which pay premia can be explained by trade union density and by the share of workers covered by an agreement. We find that declining collective bargaining coverage is a key indicator, if not source, of workers' declining bargaining power which shows in reduced pay premia. While the coverage rates of collective agreements have generally declined over time, there is greater variation in the trends concerning premia. Multivariate analysis shows that a decrease/increase in the coverage rate is associated with a decrease/increase in the relative pay of those covered compared to those who are not covered.

Introduction

In which contexts do collective agreements remain relevant and with what effect on the pay of those they cover? What is required for collective agreements to have bite and lead to a premium in pay? There is a wealth of evidence on the transformation of collective bargaining institutions in European countries (notably Müller et al. 2019), but our understanding of collective bargaining systems remains incomplete without addressing the key questions related to collective bargaining coverage and pay premia – the difference in pay someone receives from being covered by a collective agreement compared to a similar worker who is not.

In order to do so, this paper maps developments in collective bargaining coverage in Europe between 2002 and 2018. It also analyses developments in collective pay premia; that is, the additional pay associated with being covered by a collective agreement. Using evidence from the European Structure of Earnings Survey (ESES), it also investigates the extent to which differences in pay premia can be explained by two hypothesised elements of bargaining power: collective bargaining coverage; and trade union density. Importantly, we only focus on pay in this paper. However, collective agreements also cover many other aspects of job quality. Indeed, over time they may have shifted more to other aspects such as working time.

There are several studies of pay premia at national level using survey evidence (e.g. Stephan and Gerlach 2005; Ramos et al. 2021; Magda et al. 2016) and panel data (Gürtzgen 2016). The latter, in particular, allow a detailed systematic assessment of pay premia in individual countries. However, international comparative analysis is limited to OECD reports which are also based on ESES for European countries but which analyse pay premia only for 2014 (see, in particular, OECD 2019: 120-121). Our comparative understanding of the effects of sectoral bargaining is especially limited. The OECD's assessment of the literature concludes that, on average, sectoral bargaining is not linked to higher wages, but its own results presented in the same report show a considerable variation in sectoral premia (OECD 2019: 121). Previous work has shown that collective bargaining has a strong effect on the spread of wages – lowering inequality overall – but has not provided sufficient information on how they themselves affect the level of wages (OECD 2018; Zwysen 2022).

Existing studies of pay premia also tend to be descriptive in their aims, focusing on identifying the magnitude of respective pay premia. The analysis by Garnero et al. (2020) supports empirically the standard assumption that pay premia will reflect the size of the rents, typically stemming from the market power enjoyed

by a firm, to be shared with the workers (e.g. Boeri and van Ours 2013). At the same time, it is common to assume that pay premia reflect the power of trade unions (e.g. Magda et al. 2016). Ramos et al. (2021), for instance, consider pay premia *per se* an indicator of the power of collective bargaining, reflecting also the ‘social model’ prevailing in the country. While these analyses are very important, we lack a systematic investigations of the political and institutional factors that give a collective agreement a bite.

Our analysis aims to address some of these gaps. We provide a comparative assessment of collective bargaining coverage and pay premia in 28 European countries and analyse how they changed in the 2002-2018 period. ESES allows us to distinguish coverage and premia at different levels. We are thus able to analyse coverage through multi-employer and firm-level agreements separately, as well as the premia associated with each level. Increased flexibility within bargaining systems has undermined the assumption that firm-level provisions can only improve on sectoral ones (as in OECD 2019: 121). In some countries, Germany in particular, there is a discussion about the extent to which there is a flight from sectoral agreements. The negative sectoral premia found in some countries, including Germany (in OECD 2019: 121; but not in other studies e.g. Stephan and Gerlach 2005; Fitzenberger et al. 2013) and Spain (Ramos et al. 2021), seem to support that point of view. We thus consider the link between sectoral and firm-level bargaining in terms of relative premia – a key feature of a (centralised) industrial relations system – which may be established empirically.

Moreover, we analyse publicly and privately owned establishments separately. The nature of bargaining in the public and private sectors differs significantly (e.g. Keune et al. 2020). In many countries, publicly owned entities rely on upper-level or ‘other’ agreements. Publicly owned entities also suffer from an inconsistent classification of types of agreements as reported in ESES. Furthermore, public and private sectors differ widely in the strength of trade unions in terms of density and possible limitations on the right to strike. Analysing both sectors separately is thus key to understanding the nature of the collective bargaining system.

Lastly we attempt to explain the variation in pay premia and the changes over time. Rather than assuming pay premia to indicate bargaining power directly, we explore the association with two key components of bargaining power: collective bargaining coverage; and trade union density.

We find that, while collective bargaining coverage has generally declined over time, there is greater variation in the trends concerning premia. At the same time, as revealed by multivariate analysis on the level of country-sector-years in the private sector, there is more in the link between the developments in coverage and premia than meets the eye. We show that the decline in coverage rates that we see in many European countries, particularly those with already relatively low coverage and decentralised arrangements, is not separate from the pay related to these agreements. Greater levels of decline are associated with a worsening relative position in the pay of those who are covered by collective bargaining. The observation that low-coverage industrial relations systems are often associated with higher premia may thus provide false comfort. Falling coverage is a problem

also for the workers who remain covered by collective agreements as it indicates, if not drives, a loss in bargaining power. This relationship can go both ways as reductions in pay premia may make it less attractive to strive to join a collective agreement.

After introducing our data and methods in more detail, we provide a bird's eye view on the changing landscape of collective bargaining systems in Europe during 2002-2018. To map the trends and country variation in collective bargaining coverage and the collective pay premia associated with it, we use aggregate data, available for a larger set of countries. Analysis of the aggregate level, however, does not allow a distinguishing of public and private sectors and, crucially, does not account for the compositional differences that may drive the premia observed at aggregate level. In order to do so, the later sections use a micro-level dataset available for a smaller set of 22 countries. With this dataset, we map developments in centralisation and coverage in the public and the private sectors. This is followed by an analysis of pay premia in the private sector. We also consider patterns and developments in individual countries and relate them to the respective collective bargaining models. The final section explores the role of the two sources of bargaining power in explaining pay premia through the use of multivariate analysis on the level of country-sector-years. Developments in individual countries can be followed in more detail in the country data provided in Appendix A.

1. Data and methods

The European Structure of Earnings Survey is a large cross-national European database collected every four years from 2002¹ in workplaces with at least 10 employees. It includes information on the characteristics of workers and, at workplace level, it includes information on whether the majority of workers are covered by a collective pay agreement and, if so, of what type. This survey provides detailed data on earnings and hourly pay as well as important demographics such as gender, age and education; and work-related variables such as contract arrangements and occupation. Importantly it also distinguishes between workplaces that are predominantly publicly owned (hereafter public) and those that are predominantly privately owned (private).

While very useful, ESES does not represent workers in small firms (fewer than 10 employees in a workplace). As coverage may differ between small and larger firms this can induce some bias in our estimates. One source of uncertainty in interpreting the results comes from surveyed companies being required to choose one type of agreement that covers more than 50 per cent of employees in the company (or enterprise as a whole). However, in some countries, companies can be simultaneously covered by agreements at multiple levels. There will therefore seem to be variation between firms in their coverage, but this can be due to them recording the same set of agreements differently. This way of reporting also means that all workers in a workplace are assigned to a collective pay agreement, even if in reality it may only cover half.

This paper studies how wages differ between types of collective pay agreement by showing the relative difference in hourly wages.² To estimate pay premia correctly, we must account for differences in selection – as workers who are covered by a collective agreement may differ from those covered otherwise, or who are not covered, by characteristics which may themselves affect wages such as the type of work they do or their qualifications.

Pay gaps between types of agreements are compared here in two ways. First, as a description of pay we estimate a regression separately for everyone covered by one of four types of collective pay agreement: any agreement; a central agreement

-
1. In 2002, the survey included somewhat different industries. To account for differences in the sampling frame this wave is reweighted to be comparable to the others.
 2. We measure wages as the logarithm of the hourly wage. The difference between logarithms of the wage approximates the relative difference in wages so all differences and premia can be interpreted as a percentage change.

[national, sectoral or other]; firm-level agreement; or no agreement. This prediction equation is then used for the whole workforce in a specific country to predict what their wage would have been given their characteristics X (gender by age, education, occupation, tenure at the firm [squared], hours worked [squared], weeks worked in a year [squared], temporary contract or not, and firm size) were they to be covered by any of the four types of collective pay agreement. When comparing wage trends the composition is kept constant as predicted wages based on the characteristics of the full sample are used.

This is expressed in the equations below. First, a wage estimation is predicted for each type of collective pay agreement p (any, central, decentral, none) by country c . Then the coefficients from these regressions are used to predict the wage based on characteristics X for all workers regardless of their own type of collective pay agreement. These predictions are then compared to approximate the difference in wages were everyone to be covered by one or another type of agreement.

$$Wage_{c,p} = \alpha + \beta_1 * X + \varepsilon_{c,p} \mid CPA = p$$

$$Pred_{c,p} = \widehat{\beta_{1,p}} * X \mid CPA = all$$

When comparing two types of coverage directly – any rather than no agreement; and central rather than firm-level agreement – a second approach is used. Here, those in the comparator group (covered by any agreement or a central agreement) are compared to those in the reference group (no agreement or a firm-level agreement) who have the same characteristics, as well as having similar unobservable characteristics, by taking the same percentile of the residual. This approach means that every person in the comparator group gets the closest counterfactual wage – what they are expected to have earned if covered by another type of agreement or no agreement – and the difference between these is the premium (OECD 2019: 117). We estimate two comparisons: those for any agreement vs no agreement; and the comparison when covered by a central agreement rather than a decentralised, firm-level one. We estimate a regression for the comparator c (any agreement; central agreement) and the reference r (no agreement; decentral agreement).

$$Wage_{comp} = \alpha_c + \beta_{1c}X_c + \varepsilon_c \mid CPA = comp$$

$$Wage_{ref} = \alpha_r + \beta_{1r}X_r + \varepsilon_r \mid CPA = ref$$

Based on these regressions we estimate the counterfactual wage – what those in the comparator group would have earned had they been covered by the reference category (no agreement or decentral agreement), based on their individual characteristics X . Besides the prediction they are also assigned the average residuals from the reference group in the same percentile where their residuals lie ($\hat{\varepsilon}_r(\hat{p}_c|X_c)$)– meaning that the relative position of residuals, which capture unobserved factors and shocks, is taken on board when estimating the counterfactual. The premium is then the difference between the actual hourly

wage for each person covered by the comparator group (any or central agreement) and their counterfactual wage if they were instead in the reference group (no agreement or a firm-level agreement).

$$Wage_{counterfact} = X_c * \widehat{\beta}_{1r} + \hat{\varepsilon}_r(\hat{p}_c|X_c)$$

$$Premium_{comp,ref} = Wage_{comp} - Wage_{counterfact}$$

The second method is more appropriate to compare two distinct groups but, on the whole, the results are comparable (see Appendix B on Methodological Extensions for more information).

2. Collective bargaining in Europe at a glance

In order to obtain our bird's eye picture of the differences in industrial relations systems and their key developments, this section maps the changes in collective bargaining coverage, the degree of centralisation and the average pay of workers covered by collective agreements in the 27 countries for which aggregate data is available. It uses aggregate data on workers covered by collective agreements and the average wages they receive from ESES, as made publicly available by Eurostat. Aggregate data allows us to cover a larger set of countries than the micro-level data analysed in subsequent sections. However, aggregate data is only indicative of the underlying differences in industrial relations systems. Most importantly, pay premia cannot account for compositional factors; that is, to control for firm level and worker characteristics. Moreover, in many countries, coverage and centralisation differ between the private and the public sector which cannot be uncovered by aggregate analysis. In any case, the aggregate data indicate a clear trend of falling coverage in a majority of countries. This is accompanied by an increasing relative importance of upper-level agreements in a number of low-coverage countries.

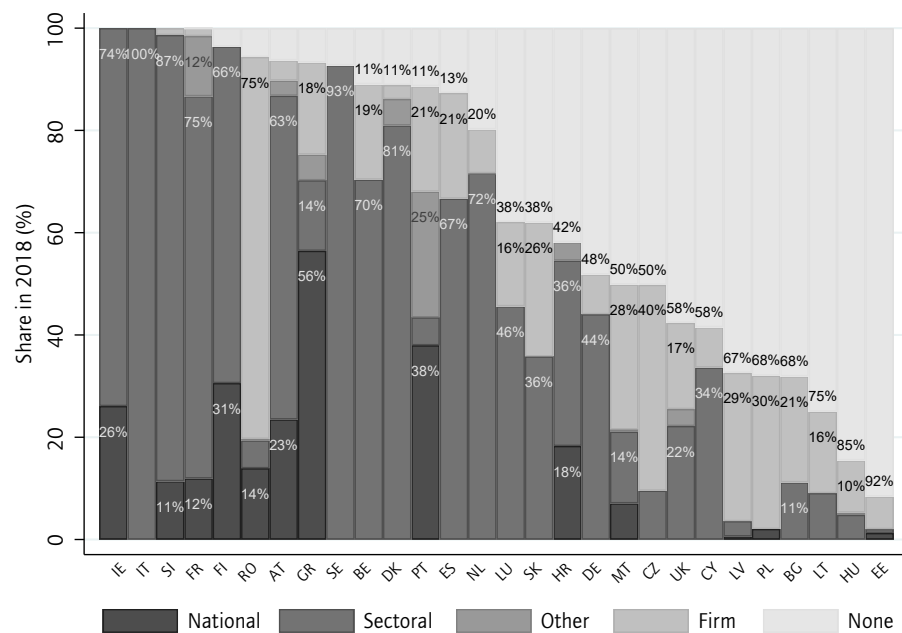
Overall coverage rates by type of agreement reported by establishments in ESES in 2018 are shown in Figure 1. ESES distinguishes between national, sectoral (including regional sectoral), 'other' and firm-level agreements. It is not always clear what 'other' or even 'national' agreements refer to. In some countries, these agreements are used mainly by public companies.³

Coverage rates reported in ESES are likely to be higher than those reported in other sources. The dataset only includes workplaces with at least 10 employees; while smaller companies are less likely to be covered. Moreover, the whole establishment is considered to be covered by a pay agreement if at least half of the workforce is reported as covered. A comparison with alternative estimates is discussed in Appendix C which indicates that the coverage figures reported in ESES may indeed over-estimate coverage rates. At the same time, ESES captures the underlying differences in collective bargaining coverage in Europe — with the exception of the results for Ireland, Greece and Romania where larger measurement errors are found. There are signs of over-reporting in other countries too, but the latter rank among low-coverage countries. Our analysis of the micro-level data suggests that many of the measurement errors are related to the inconsistent classification of agreements within public companies in ESES.

3. This applies to France and Spain as far as 'other' agreements are concerned; and Belgium, Cyprus, Estonia, France and Romania when it comes to national agreements.

With these caveats, Figure 1 indicates clear dividing lines in the European collective agreement landscape. On the one hand are countries where (almost) all workers are covered by some type of agreement such as Ireland, Slovenia, Italy, France, Finland and Romania. On the other hand, fewer than half of workers are covered by some form of agreement in 10 countries, mainly in central and eastern Europe (Estonia, Lithuania, Hungary, Bulgaria, Poland, Latvia and Czechia) but also in the United Kingdom, Malta and Cyprus. A second key dimension of difference is the type of agreement which covers workers. In many countries with low coverage, most agreements are at the level of the firm. These agreements rely more on the individual bargaining power of workers compared to their employer. National agreements occur only in some countries and, as shown in the micro-level data later in this paper, this is mainly driven by the public sector. The most common centralised agreements are sectoral or at sectoral within regional level.

Figure 1 Different types of collective agreements covering workforce in 2018

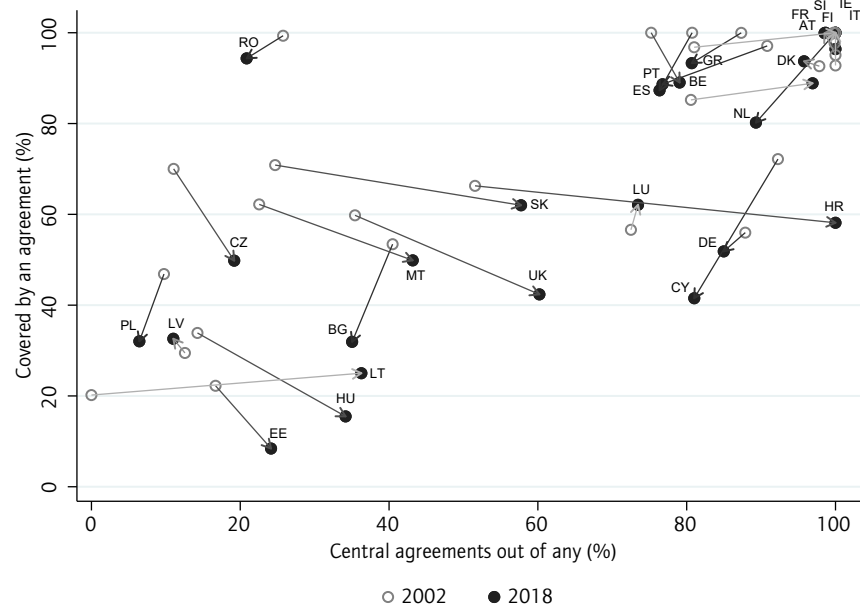


Source: EARN_SES18_01 for 2018

A more comprehensive understanding of the differences between industrial relations systems can be gained by analysing the coverage rate together with the degree of centralisation; that is, the share of upper-level agreements in overall coverage.⁴ Figure 2 maps the changes in coverage and centralisation in 2002 and 2018; i.e. the first and the last year available in ESES (see also the footnote). This is shown separately for the two dimensions in Figure A 1.

4. We consider all non-firm level agreements as upper-level or centralised.

Figure 2 Difference in the share of workers covered by different agreements from first year to last year



Note: the figure shows the share of workers covered by a collective pay agreement from 2002 (2006 in Malta, 2010 in Croatia and Poland) to 2018, in per cent. Years were dropped if the change from any covered to not covered was over 30 percentage points from one wave to the next in absolute values. Malta changed from 100 per cent in 2002 to 62 per cent in 2006; Poland from 100 per cent in 2006 to 47 per cent in 2010, as these were the first year and seemed outliers they are dropped. Source: EARN_SES_AGT01 for 2002, EARN_SES06_01 for 2006, and EARN_SES18_01 for 2018

Unsurprisingly, high-coverage countries tend to be those with a high degree of centralisation. Overall, the correlation between coverage and centralisation is 0.72 (for all country/years). At the same time, there are differences in the degree of centralisation among high-coverage countries. More specifically, firm-level agreements play a more important role in Belgium, Portugal and Spain.⁵ Among low-coverage countries, Cyprus, the UK and Slovakia exhibit a higher degree of centralisation.

A comparison over time (Figure 2) shows declining coverage across the board, with a fall in coverage recorded in 18 out of the 27 countries. More stable, or even increasing, rates of coverage were reported among countries with already high rates of coverage, while larger falls took place in a group of countries that recorded middle level coverage in 2002.

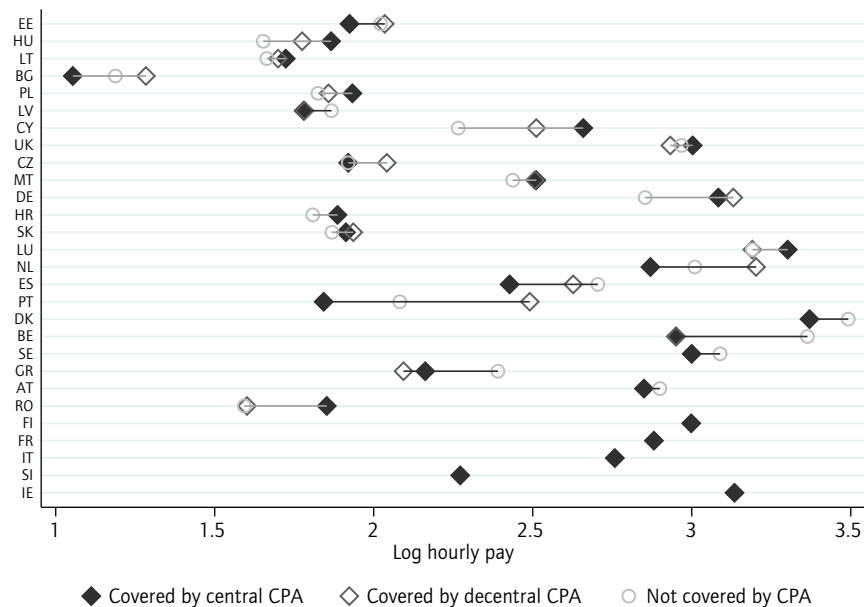
5. Greece apparently falls into this category, but the high level of coverage is likely a measurement artefact.

As far as degree of centralisation is concerned, there is no underlying trend. At the same time, among the low-coverage group, a fall in coverage was typically accompanied by an increase in centralisation. This suggests that a fall in the number of firm-level agreements tended to drive drops in coverage in low-coverage countries. However, this pattern was not observed in Poland, Bulgaria, Cyprus and Germany where the fall in coverage was accompanied by decentralisation. This pattern was common also among high-coverage countries.

Figure 2 shows a cluster of high-coverage, high-centralisation countries in the upper right corner. This group is characterised by a large degree of stability. There are examples of decentralisation (notably Portugal) as well as centralisation (notably Denmark). Low-coverage countries are typically characterised by falling coverage accompanied by centralisation. This centralisation generally occurs as the drop in firm-level coverage is faster than the drop in coverage by sectoral or national agreements. The exceptions include Poland, Bulgaria and Cyprus that recorded shrinking coverage amidst decentralisation.

Finally we compare hourly wages for those covered by central agreements, firm-level agreements and those not covered by any collective agreement (Figure 3). The comparison is indicative of the differences in pay. Importantly, however, it does not take into account differences in the composition of workers and firms. We control for compositional differences in the next section, but can report only on a smaller set of countries for which micro-level data is available.

Figure 3 Average hourly wage by different types of collective agreement in 2018



Note: the figure shows the average log hourly wage of those covered by no agreement, a central agreement or a firm-level agreement in 2018. Coverage is based on at least 5 per cent of the workforce falling under a specific type of agreement.

Source: Earn_SES18_01 and Earn_SES18_12 from Eurostat

A standard expectation is for upper-level agreements not to be as closely associated with pay premia while firm-level agreements, especially when they are extensions of upper-level agreements, would be associated with generally higher pay (e.g. OECD 2019). In general, centralised systems with high levels of coverage are indeed associated with negative premia for being covered by any agreement, with non-covered workers enjoying, on average, higher wages. Importantly, as there are relatively few people not covered by a collective agreement, there is likely to be a large amount of selection bias, with those in higher-paying positions least likely to be covered. At the same time, some of these countries record positive premia for being covered by central agreements when compared with firm-level agreements. Moreover, there is wide variation in the differences in average wages for workers covered by different pay agreements. As shown in Figure 3, the differences in average wages are small in some countries, indicating a lack of premia for any collective agreement or a greater similarity with the characteristics (and pay) of workers who are covered by different agreements. Where they exist, differences in average pay can go in different directions. In Germany, for instance, firm-level agreements are associated with the highest pay followed by central pay agreements, with the average pay of non-covered workers being much lower. In Portugal, Bulgaria and Netherlands, firm-level agreements are associated with the highest pay and centralised agreements with the lowest. In Belgium, to give another example, non-covered workers have much higher pay than covered workers.

3. Trends in coverage and pay premia from micro-level data

3.1 Centralisation and coverage in the public and private sectors

While the aggregate data provides a good starting point, it does not include any further information on the differences between workers and firms covered by different types of agreement. This section therefore describes the trends in coverage by using ESES micro-level data. This is available for a narrower set of countries but it does allow for more detailed analysis. Importantly, it makes it possible to analyse public and private establishments separately. This is important in terms of getting a better understanding of the systems of collective bargaining in individual countries since collective bargaining in the public sector is often quite specific and, in some countries, public companies are more likely to be covered by upper-level agreements.⁶ Despite the measurement issues explored above, indicators of coverage are broadly consistent across the micro-level and aggregate data sets, as discussed in more detail in Appendix D.

Figure 4 compares the degree of coverage and the extent of centralisation in the public and private sectors. It shows a lower degree of coverage by collective agreements in the private sector with the exception of Greece and Spain, which recorded full coverage in 2002-2006 although this was later reduced, primarily in the public sector. In centralised countries with high coverage, including Italy, France, Finland and Sweden, the differences in coverage between private and public sectors are small or non-existent. Belgium⁷ also belongs to the set of full coverage countries although its private sector is more decentralised. The differences in coverage between public and private sectors are particularly large in Cyprus, Germany, the UK, Slovakia, Latvia and Bulgaria. In these countries, coverage in the public sector compares to countries with the highest coverage while private sector coverage is rather low.

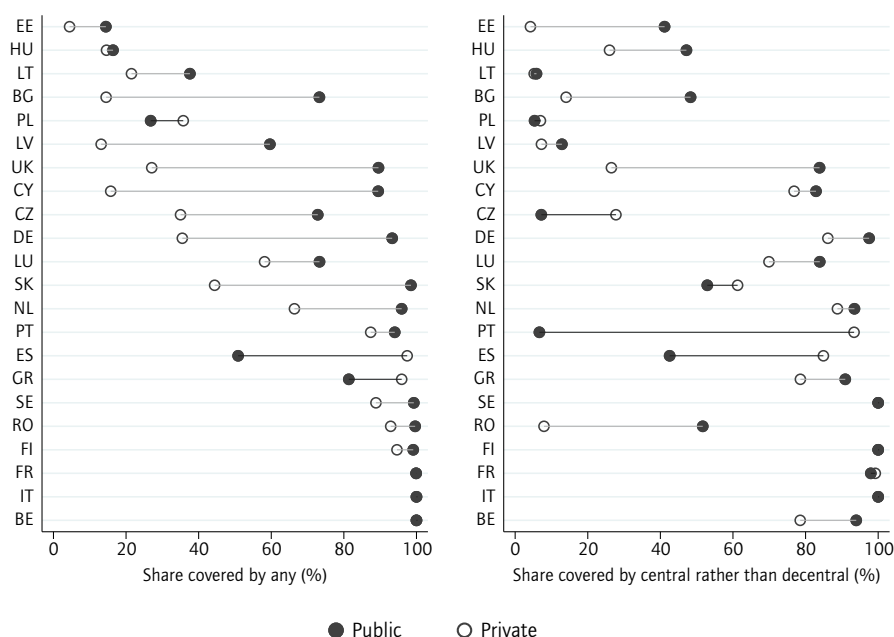
The degree of centralisation tends to be lower in the private sector but the differences tend to be moderate. Portugal is an exceptional case, recording a

6. National agreements are used mainly in the public sector in Belgium, Cyprus (2002), Estonia (little), France (after 2002) and Romania but are used similarly across sectors in Italy, Greece and Finland, and mainly in the private sector in Portugal. 'Other' agreements used generally in Germany; in the private sector in Portugal, and in the public sector in France, and Greece.

7. Coverage in the public sector shifts completely from full to no coverage from 2014 to 2018 in the ESES in Belgium, which is likely to be a reporting issue. We therefore use 2014 as the end-year in the public sector in Belgium.

high difference in centralisation between public and private companies, with the private sector covered by centralised agreements. Less extreme, there is a similar pattern of almost complete decentralisation in the private sector compared to a rather centralised public sector in Estonia, the UK, Romania, and Bulgaria.

Figure 4 Coverage and centralisation, public and private sectors in 2018



Note: the figure shows the share of workers covered by a CPA (left) or by a central CPA rather than a firm-level agreement (right), for workplaces that are more than 50 per cent publicly owned and those that are majority privately owned, in the last available year of the SES (2018 in most countries, 2014 for the UK and for the public sector in Belgium).

Source: ESES 2002-2018

The differences in coverage and centralisation between countries, as well as the changes between 2002-2018, are displayed for the private sector in Figure 5 and for the public sector in Figure 6. There is a clear decline in collective bargaining coverage in the private sector, as summarised in Table 1 which provides a classification of countries based on developments in collective bargaining coverage and centralisation in the private sector. In private companies, coverage declined in 17 of the 22 countries for which data is available. As far as the degree of centralisation is concerned, the overall trend is less clear with 10 countries moving towards a greater relative share of centralised agreements and 12 towards more firm-level coverage, relative to coverage by higher-level agreements.

Figure 5 also shows a stronger relationship between centralisation and coverage taking shape in 2002-2018 in the private sector. This process led to a polarisation towards two clusters: high-coverage and highly centralised countries in the upper right corner; and low-coverage and decentralised countries in the lower left. This happened mainly through a significant drop in coverage among decentralised countries in eastern Europe (Poland and Czechia in particular). There was a lower

drop in coverage in Slovakia that may be linked to the increasing importance of sectoral agreements. Countries that were in the low-coverage and low centralisation group in 2002 tended to record further drops in coverage. This was often accompanied by an increase in centralisation as the number of firm-level agreements dropped.

Among the high-coverage/centralisation group, there was greater stability but also a trend towards decreasing coverage and decentralisation particularly in Greece (under-estimated in our figures), Cyprus and the Netherlands. These countries thus lowered coverage through a shrinking of upper-level agreements.

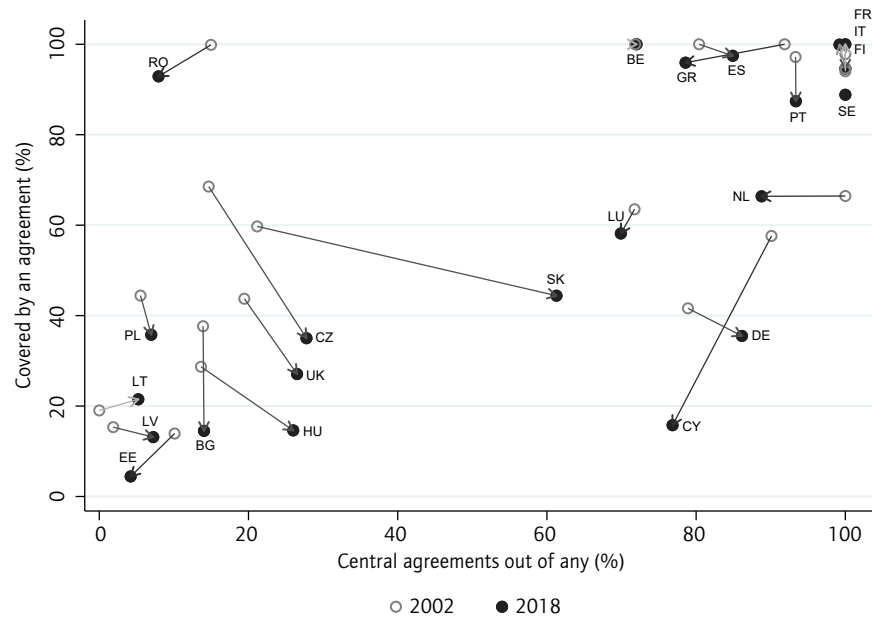
Declining coverage also characterises the public sector (Figure 6), but the trend is less widespread than in the private sector, affecting 12 out of 22 countries. There is a stronger trend towards centralisation, characterising 14 countries in the sample.

Table 1 Classification of countries based on changing coverage (2002-2018), private sector

Change in coverage / centralisation	Relatively more covered by central [centralisation]	Relatively more covered by firm-level [decentralisation]
Coverage drops	Bulgaria, Czechia, Germany, Spain, Finland, Hungary, Latvia, Poland, Portugal, Slovakia, United Kingdom	Cyprus, Estonia, Greece, Netherlands, Romania, Sweden, Luxembourg
Coverage increases	Belgium, Italy, Lithuania	France

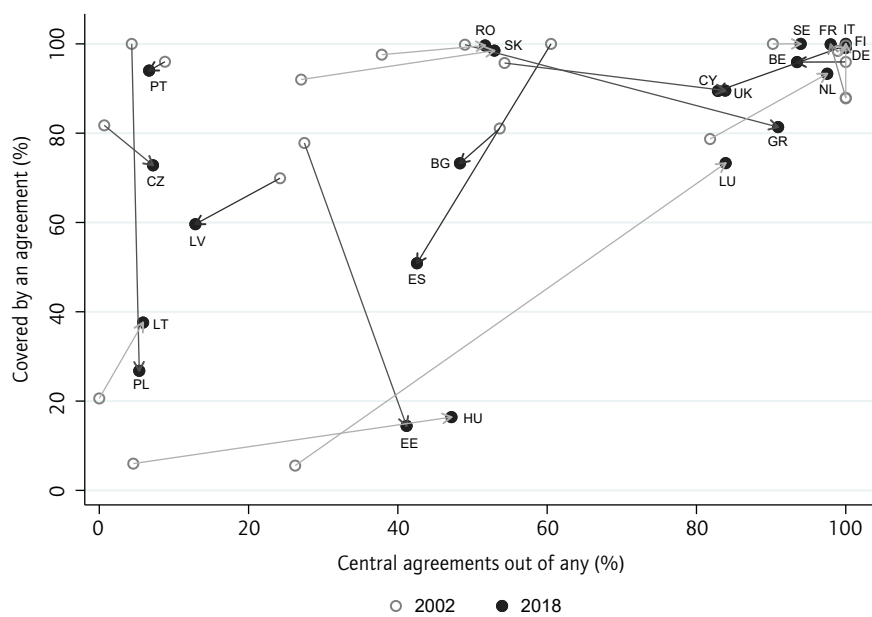
Source: ESES 2002-2018

Figure 5 Change in coverage rate (2002-2018), private sector



Note: the figure shows the change in the private sector from the first year (2002 generally, 2006 for DE and 2014 for NL) to the last year (2018) in the share of workers covered by any agreement (y axis) and, out of those covered, how many were covered by a central agreement (x axis: national, sectoral or other) rather than a decentralised one (firm or workplace).
Source: ESES 2002-2018

Figure 6 Change in coverage rates from first to last year, public sector

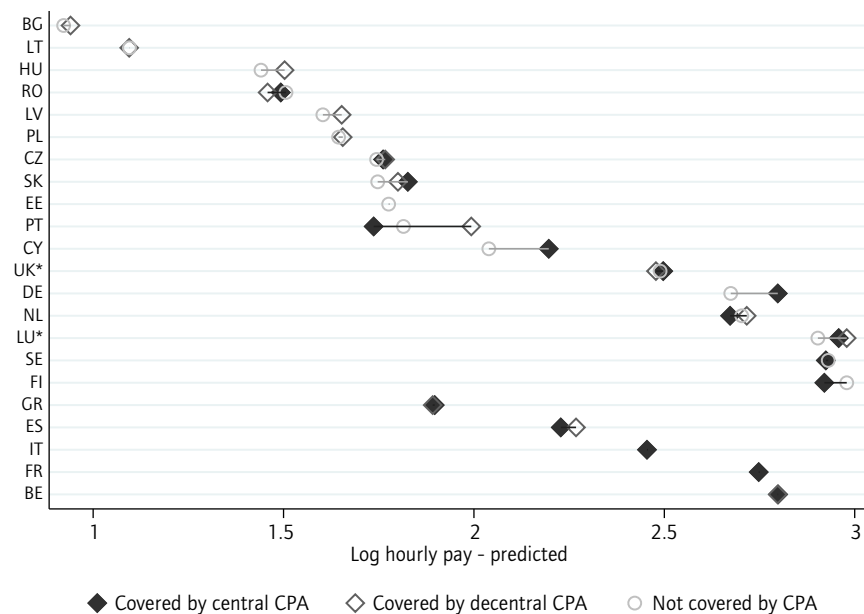


Note: the figure shows the change in the public sector from the first year (2002 generally) to the last year (2018; 2014 in Belgium) in the share of workers covered by any agreement (y axis) and, out of those covered, how many were covered by a central agreement (x axis: national, sectoral or other) rather than a decentralised one (firm or workplace).
Source: ESES 2002-2018

3.2 Variation in pay premia in the private sector

This section uses ESES micro-level data to describe the most relevant pay premia in the private sector (see Appendix D for figures on coverage and premia over time per country). By using micro-level data we can estimate the actual premia – the differences in pay for otherwise similar workers – as differences in average wages can also reflect large differences in the type of people who fall under different agreements.

Figure 7 Estimated wages – keeping all characteristics constant – in last available year for different agreements

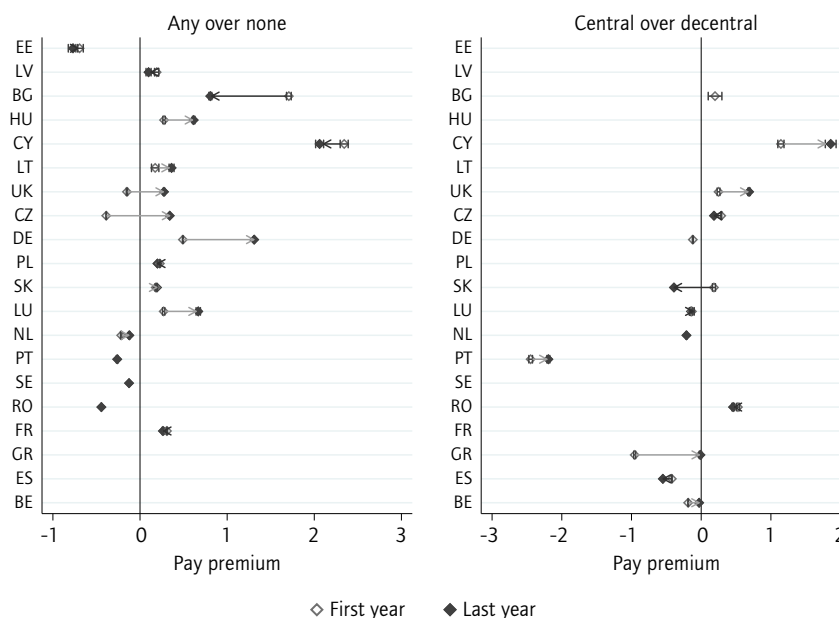


Note: the figure shows the predicted log wage for all workers, with coefficients obtained from a regression controlling for individual and firm-level characteristics separately per type of agreement. Predicted wages are only shown if at least 5 per cent of the workforce falls under a specific type of agreement. *: last year 2014, not 2018.

Source: ESES 2002-2018

The differences in estimated wages for different types of agreement are presented in Figure 7. As can be expected, the differences in predicted pay under the different types of agreement are smaller than the differences in the average pay of the workers covered by these agreements presented in Figure 3. Apart from accounting for compositional factors, estimates in Figure 7 are based on data only from private companies. Even so, the structure of the differences remains broadly consistent with the differences in the averages reported in Figure 3 and discussed above. We can see relatively higher pay in those countries with generally higher coverage. In several countries those covered by decentralised firm-level agreements tend to earn more than those under centralised agreements, but this is not always the case. Generally, the wages of those who are covered by a pay agreement seem to be higher than those who are not covered.

Figure 8 Pay premia in the private sector



Note: sorted by collective bargaining coverage in the last year. The figure shows the estimated pay premia for being covered by a collective pay agreement rather than not, using a counterfactual analysis comparing the covered with the non-covered, controlling for gender by age category, education, occupation (1-digit), years with the firm [squared], hours worked per month [squared], weeks worked in the year [squared], temporary contract, firm size and industry dummies, separately per country and year. The counterfactual is the predicted value for those not covered by the same observed categories and with the residual from the reference regression in the same percentile of residuals as the respondent. It is only shown if at least 5 per cent of private sector employees are covered by either any or no agreement. The first year that premia are observed is 2002 generally but 2006 for Germany and Portugal; 2010 for Poland; 2014 for Greece, the Netherlands and Romania; and 2018 for Sweden. The last year is 2018 generally but 2014 for Estonia, Greece, Lithuania, Luxembourg and the UK; and 2006 for France.

Source: ESES 2002-2018

In order to facilitate a comparison of pay premia across countries, we plot in Figure 8 the premia for each country of any agreements relative to no coverage; and those of centralised agreements relative to decentralised ones. The highest premia for any type of collective agreement in the private sector are observed among countries with low collective bargaining coverage. The highest pay premia under any collective agreement were thus recorded in Cyprus, Germany, Bulgaria, Hungary and Luxembourg. Countries with a high degree of coverage, and centralisation, tend to record negative premia under any collective agreement.⁸ At the same time, negative premia can also be found in Estonia, a country with very low coverage. In turn, France, a country with high coverage, recorded positive pay premia in the only two years for which the share of workers in firms with no agreement exceeded 5 per cent (2002-2006). Czechia and the UK recorded negative pay premia in 2002 but positive ones in the last year (2014 in the UK).

8. Premia for any agreements were estimated only for countries where no agreements cover at least 5 per cent of workers (Belgium, Italy, Spain and Finland were thus excluded).

Large increases in pay premia were also recorded in Hungary and Germany. In contrast, Bulgaria and Cyprus recorded a drop in pay premia over time.

As far as the premia for being covered by centralised relative to decentralised agreements are concerned, about half the analysed countries recorded higher wages under centralised agreements. Interestingly, where the wage was initially relatively lower in centralised rather than decentralised pay agreements, there tends to be a move towards greater equalisation of pay over time (e.g. Greece, Portugal and Belgium). Centralised agreements are characterised by the highest relative pay premia in Cyprus, the UK and Romania. In contrast, decentralised agreements have the highest relative premia in Slovakia, Spain and, in particular, Portugal. Centralised agreements are associated with positive premia primarily in countries with low collective bargaining coverage. Other than that, there is no obvious pattern in the differences in pay between centralised and firm-level agreements.

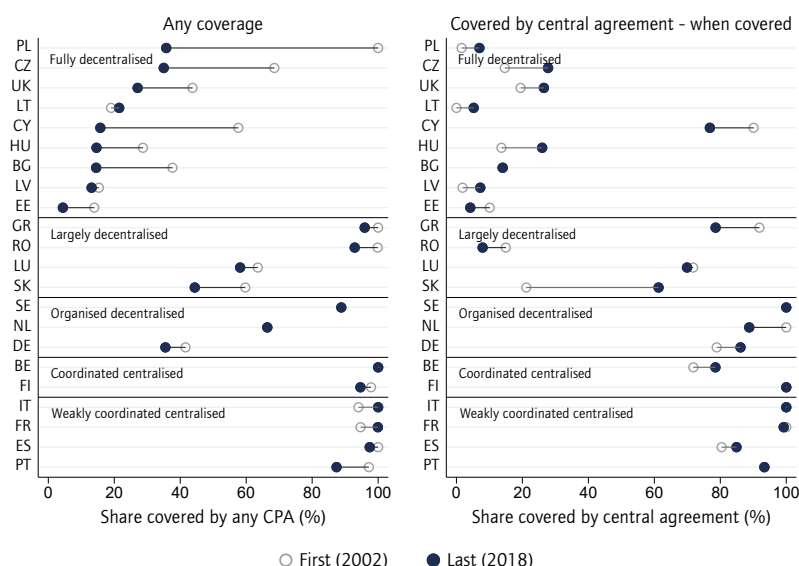
3.3 Patterns in coverage and pay premia by type of collective bargaining regime

One way to bring more structure into the country patterns found here is by looking at the differences between countries based on their collective bargaining system. A recent useful typology is proposed by Garnero (Garnero 2021; OECD 2017) which classifies countries based on the main level of bargaining, the degree of flexibility that exists within these arrangements and the extent of horizontal coordination between bargaining units. The argument put forward is that the extent of coordination plays a key role in engendering better outcomes – higher employment, lower inequality and the better integration of vulnerable groups (Garnero 2021). This is relevant with regard to pay premia as it accounts for differences in the level of bargaining as well as coordination and extensions which can both affect the extent to which agreements also encompass other workers.

Five main types are identified, based on the latest observed years.⁹ First, countries characterised by rather centralised and weakly coordinated collective bargaining (Italy, France, Spain and Portugal). Second, countries where bargaining is predominantly centralised and there is coordination across sectors (Belgium and Finland). Third, organised decentralised collective bargaining where sectoral agreements are important but room is left for local agreements (Sweden, the Netherlands and Germany). There are two types of decentralised system: largely decentralised collective bargaining where the dominant level is the firm but there is some role for sectoral bargaining (Greece, Romania, Slovakia and Luxembourg); and fully decentralised collective bargaining where bargaining essentially occurs only at firm-level (Czechia, Poland, Cyprus, United Kingdom, Lithuania, Bulgaria, Latvia, Hungary and Estonia) (Garnero 2021).

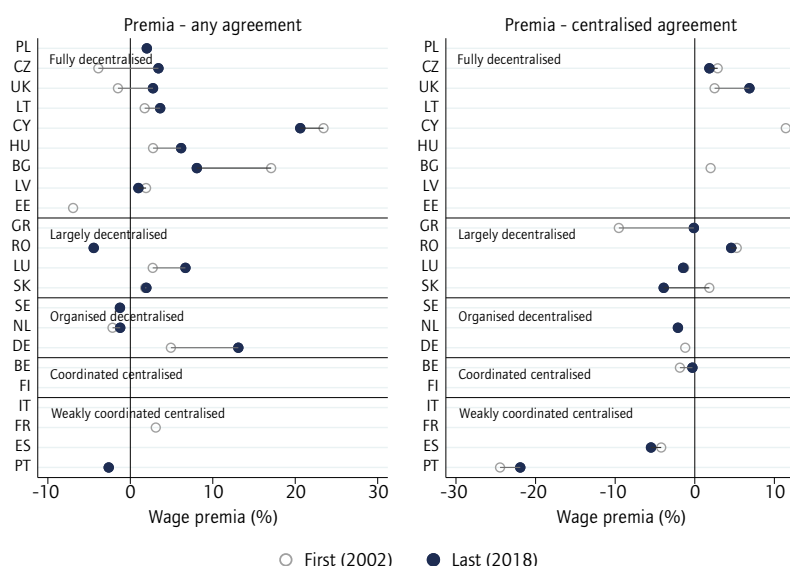
9. OECD (2017) and Garnero (2021) classify most countries into this typology over time – we use the 2015 levels. Based on the ICTWSS we assigned Romania as a largely decentralized collective bargaining system; and Bulgaria and Cyprus as fully decentralized systems.

Figure 9 Coverage rates in the private sector from first to last year – grouped by collective bargaining typology



Note: the figure shows the share of workers covered by any rather than no agreement (left), or by centralised rather than decentralised agreements (right) in the first and last available year per country, divided by collective bargaining type: rather centralised and uncoordinated; predominantly centralised and coordinated; organised decentralised and coordinated; largely decentralised; and fully decentralised.
Source: SES 2002-2018

Figure 10 Pay premia in the private sector from first to last year – grouped by collective bargaining typology



Note: the figure shows the relative difference in predicted pay – accounting for characteristics – for workers covered by any rather than no agreement (left) or by centralised rather than decentralised agreements (right) in the first and last available year per country, divided by collective bargaining type: rather centralised and uncoordinated; predominantly centralised and coordinated; organised decentralised and coordinated; largely decentralised; and fully decentralised.
Source: SES 2002-2018

Figure 9 and Figure 10 show the differences in coverage rates and pay premia between countries grouped by this typology. This highlights that the drop in the shares of workers covered by collective bargaining is most sharp in decentralised countries. The fully decentralised countries also moved towards more centralisation over time (with the exception of Cyprus and Estonia); while the largely decentralised further decentralised (except for Slovakia). Among centralised and uncoordinated collective bargaining systems there has been much less change both in types of agreement and in coverage.

As shown in Figure 10, pay premia in most countries with decentralised systems were initially very low but have increased somewhat. There has been a decline in pay premia in countries with high centralisation and very high coverage (Spain and Portugal) which can reflect the selection of non-covered workers. The difference in pay between those covered by centralised and decentralised agreements has declined over time across the board.

Differences between the covered and the non-covered tend to be higher in countries where there are relatively fewer workers covered by bargaining arrangements. This is likely to reflect greater selection – in those places where most people are covered, the non-covered stand out more and are likely also to differ from the covered in other aspects of their work situation which are associated with higher earnings.

It is important to relate the trends in coverage and premia to the differences between collective bargaining systems. At the same time, we observe a considerable variation within groups to which we turn in the next section.

3.4 Country differences

This section delves deeper into the patterns and developments in pay premia in each country separately, relating them also to key developments in coverage and – where measures of coverage in public companies do not suffer from inconsistencies – the differences between the public and private sectors. Developments in the coverage and predicted wages for each type of agreement in both sectors can be followed in more detail in the country sheets provided in Appendix A.

The high premia in the private sector in Cyprus are observed consistently over 2002-2018 with sectoral agreements being characterised by the highest pay. However, this is in the context of a disorganised decentralisation achieved through a decline in trade union capacity to organise – the intervention by the Troika has not led to any significant change in the collective bargaining system in the country (Ioannou and Sonan 2019). We indeed observe a dramatic fall in sectoral coverage and low firm-level coverage in the private sector. The coverage in the public sector is higher but collective agreements are associated with a much lower premium in this sector.

Relatively high premia were recorded also in Bulgaria. These are related to firm-level bargaining and were much higher before 2010, when coverage was higher. Sectoral agreements are rare in the private sector, falling below 5 per cent after 2002. They are, however, common in the public sector where coverage stabilised from 2010. However, estimated wages under sectoral agreements in the public sector are lowest, with the differences in predicted wages almost disappearing in 2018.

Collective bargaining premia are positive and apparently increasing in Hungary and Lithuania. However, the increase in the premium in the private sector recorded for Hungary in Figure 10 is, in fact, driven by the results for 2002. If later years are considered, the collective bargaining premium appears to have shrunk. Moreover, private sector coverage has fallen significantly in the country. In contrast, in Lithuania, the low, and predominantly firm-level, coverage is consistent over time. It is higher and somewhat increasing in the public sector. However, the collective bargaining premia are driven by pay in centralised agreements that cover very few workers.

In Czechia and the UK, collective bargaining premia improved significantly, turning positive. However, this has happened in the context of large falls in firm-level coverage. In Czechia, coverage through sectoral agreements in the private sector has remained stable but low, at about 10 per cent. Collective agreements are associated with premiums from 2010, but the differences between centralised and decentralised agreements are not consistent over time. In the public sector, pay premium is associated with decentralised agreements, which retain a relatively stable coverage, while the coverage through sectoral agreements is insignificant. In the UK, sectoral coverage is very low in the private sector. It is high in public establishments, but collective agreements are not associated with higher pay there.

In Poland, where collective bargaining takes place at company level only, the premium is stable and positive, while coverage is moderate but somewhat in decline. Coverage in the public sector is similar, but it is associated with a lower pay premium.

In Latvia, where collective bargaining in the private sector takes place only at the level of the firm, the premium is positive but declining. There are some sectoral agreements in the public sector, where the premium sectoral agreements paid on average less than the not-covered in 2018 (firm-level agreements still provided a premium that year).

Finally, Estonia is the sole fully decentralised country that records lower pay for the covered than the uncovered in the private sector. However, coverage with firm-level agreements in the private sector is very low, falling below 5 per cent in 2018. It is somewhat higher, but also falling, in the public sector where the pay premium for firm-level agreements was negative in 2018 (it was positive in most of the preceding years). The country introduced extensions of collective agreements in 2000, but that has apparently not been effective in countering the disintegration of the collective bargaining system, given that industry-level bargaining takes place only in three industries (Kallaste 2019).

In the group of largely decentralised countries, Luxembourg is characterised by positive and increasing premia under any agreement, with firm-level agreements consistently associated with higher pay than centralised agreements. Coverage by industry-level agreement in the private sector somewhat declined in 2002-2014, the years for which data is available. It increased in the public sector, but the radical increase in coverage and centralisation captured in Figure 6 apparently reflects a misclassification of collective agreements in public companies in 2002.

Romania reports consistently high coverage through firm-level agreements in the private sector (more than 80 per cent). As discussed above, the high coverage can be partly attributed to over-reporting in ESES. Negative premia on collective agreements in Figure 10 refer to 2014 and 2018 only, when the share of no agreements exceeded 5 per cent, seemingly reflecting decentralisation reforms. In most years those covered by a centralised agreement in the private sector earned more than those covered by firm-level agreements. Centralised agreements are predominant in the public sector, but are associated with lower pay than firm-level agreements in most years.

In Slovakia, sectoral bargaining plays a significant role in the private sector. Pay premiums on any type of agreements have grown over time. At the same time, coverage through firm-level agreements has declined while coverage through sectoral agreements has increased. In the public sector, coverage through centralised agreements increased in 2010-2018, while the share of firm-level agreements dropped. In the same period, pay premiums for any type of collective agreement grew increasingly negative.

The coverage data reported in Figure 9 for Greece do not best describe the transformation of the system of collective bargaining in the country in the context of the intervention of the Troika (cf. Katsaroumpas and Koukiadaki 2019). Greece, along with centralised Portugal, formerly had both national and sectoral agreements in the private sector. National agreements had effectively been dismantled in Greece by 2013, but firms continued to report coverage through national agreements in ESES in both 2014 and 2018, with their coverage actually increasing. National agreements were associated with the lowest pay in 2002-2006, but the differences between centralised and firm-level agreements almost disappeared in 2014. At the same time, we observe a drop in coverage through sectoral agreements and a small increase in firm-level agreements. The latter exceeded 5 per cent in 2014, recording the highest wages. In the public sector, sectoral agreements have virtually disappeared while the share of people not covered by any agreement – which remains very low in the private sector – have increased significantly.

In Germany, part of the group of decentralised coordinated systems, workers covered by all types of agreement consistently enjoy higher pay than those without a collective agreement. The collective pay premium in the private sector increased in the analysed period, but coverage has shrunk with firm-level agreements – which were associated with the highest pay in 2014-2018 – becoming rare. Differences in pay in the public sector are similar to those in the private sector although the coverage, typically through sectoral agreements, is much higher. We thus do not

observe any effects of a hollowing-out of sectoral agreements as a consequence of the weakening of the favourability principle that has taken place in the country (see Müller and Schulten 2019).

In the Netherlands, we could estimate premia for 2014-2018 only. This shows the highest pay for those not covered or covered by firm-level agreements. In contrast, in the public sector, no agreements are associated with the lowest pay. Data for Sweden is available only for 2018, showing a negative premium for collective pay agreements. The latter can be attributed to selection effects given the very high degree of coverage in the country.

Finally, as far as centralised countries are concerned, firm-level agreements, covering about 15 per cent of establishments in the private sector, are consistently associated with the highest pay in Spain. Apart from a small increase in private companies without any agreement, we do not observe any effects from the decentralisation reforms following 2010. In the context of the sovereign debt crisis and the Troika bailout, the country allowed for derogations from sectoral bargaining and the unilateral modification of working conditions; however, in practice, employers do not appear to have been interested in switching to company-level agreements (Fernández Rodríguez et al. 2019). In Belgium, the premium in respect of firm-level agreements was reduced by 2010, with the share of decentralised agreements dropping to 21 per cent in 2018 (from around 30 per cent in 2002-2006). What we observe is compatible with, albeit does not represent evidence for, Vandaele's (2019) finding that sectoral agreements in Belgium increasingly take the form of framework agreements without binding provisions on wages.

In Portugal, the negative and stable premium for any agreement in the private sector is accompanied by a large negative premium for being covered by centralised rather than firm-level agreements. Firm-level agreements, which account for only a small part of workers covered by collective bargaining, are consistently associated with the highest pay while upper-level agreements are associated with the lowest pay. The coverage through centralised agreements is relatively stable in the private sector. The effect of decentralisation reforms in the context of the Troika intervention (see da Paz Campos Lima 2019) may be observed in the structure of these centralised agreements, with sectoral agreements virtually disappearing in 2014-2018 and national and other agreements increasing. In the public sector, coverage through decentralised agreements increased in 2014-2018. These agreements are consistently associated with the highest pay also in the public sector.

4. What explains the differences in pay premia? Analysis of country-sector-years

This section describes the relationship between changes in collective bargaining coverage and the premia enjoyed by those who are covered by a collective pay agreement as opposed to those who are not covered or else covered by another type of agreement. As discussed above, the coverage rates of collective pay agreements have generally declined over time; while there is greater variation in the trends concerning premia. The strength of collective agreements, and the possibility of collective bargaining to ensure good wages, may well depend on coverage rates and how binding the agreement is, where the bargaining power of the social partners depends on the share of workers represented and bound by the agreement. This ‘degree of control’ is one aspect of the bargaining position, together with the strength of the membership and its willingness to mobilise (Clegg 1976; cf. Waddington et al. 2019). We therefore also expand the analysis to test the extent to which trade union density, as another source of bargaining power, can be linked to variations in pay premia.

Importantly, this section considers the relationship between coverage rates and pay premia – as the difference between otherwise similar workers who are covered by different pay agreements – over each wave of the SES (2002, 2006, 2010, 2014, 2018) and for nine sectors, meaning there are 176 country-sector groups per year to which we can relate premia and coverage rates.

Also at country-sector level there is, on average, a negative relationship between the share of workers covered and the average premia found descriptively. Table 2 relates the overall level of coverage by a collective agreement (top), and the relative share of those covered who fall under a centralised rather than a firm-level agreement (bottom), to the relevant premia within a country-sector-year. On average, when only accounting for common industry and common country levels (M1), the pay premium resulting from being covered by any agreement is 1 per cent lower where the share of covered workers is 10 percentage points higher. This negative association is in line with the descriptive findings shown above – premia tend to be lowest in countries with high or near-full coverage. This relationship becomes weaker when we account for trends over time (M2), as coverage declines commonly. In the final model (M3) we also control for differences between sectors in the composition – gender, age, education, time spent working and type of contract. When comparing similar country-sectors in the same year, there is still a negative association in which the premium is 1.3 per cent lower in country-sectors where coverage is 10 percentage points higher. The bottom panel of Table 2 shows the association between the share of workers who are covered by centralised agreements rather than firm-level ones. This shows that, as relatively

more workers are covered by central agreements, the pay premia of those covered by decentral agreements increases relatively. This also means that if the coverage is mainly decentral, the benefits of being covered by a central agreement is higher. This likely indicates the pay bonus received by those workers who are covered by a firm level agreement which comes on top of a sectoral agreement.

Table 2 Association between levels of coverage rates and levels of pay premia in the private sector

		M1: Base	M2: add year	M3: Change in composition
Any over none N=530	Coefficient	-0.117***	-0.0660**	-0.128***
	s.e.	(0.0302)	(0.0334)	(0.0408)
	R squared	0.389	0.428	0.467
Centralised over decentralised N=348	Coefficient	-0.0154	-0.0640**	-0.0863***
	s.e.	(0.0260)	(0.0271)	(0.0286)
	R squared	0.390	0.429	0.531

Note: regression of the premia in log wages (using the counterfactual method) on coverage rates at country, sector and year level, weighted for relative size of country-industry-sector. M1 includes only country-sector fixed effects; M2 adds year fixed effects; and M3 includes composition (share of educational groups, age groups, share of women, share of medium and large firms, average hours worked).

*, p<0.1, **, p<0.05, ***, p<0.01

Source: ESES 2002-2018

Table 3 repeats this analysis using indicators on union density, union membership and coverage rates as provided in the ICTWSS database which are based on national data where possible. There is a positive, statistically significant ($p<0.05$) association between the overall adjusted coverage rate and pay premia, which provides a first indication that the degree of control related to collective agreements is linked to the premia. However, there is no statistically significant ($p<0.1$) relationship between union density or union membership and the pay premium for being covered by any rather than no agreement. This can be attributed to other forms of associational power that unions can rely on in mobilising workers. The finding also underscores the importance of institutional power that underpins the coverage rate.

Table 3 Association between premia and external indicators of bargaining power – ICTWSS

	Union density sector	Union density country	Union membership country	Adjusted coverage rate
Coefficient	-0.0361	-0.201	-0.0233	0.272***
s.e.	(0.132)	(0.544)	(0.0471)	(0.0526)
N	339	530	299	326
R squared	0.538	0.456	0.608	0.599

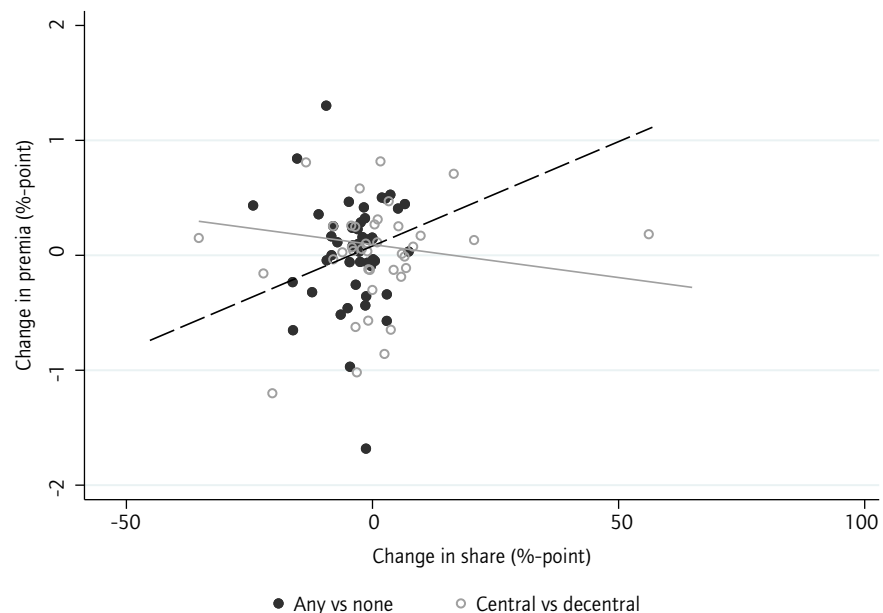
Note: regression of the premia in log wages (using the counterfactual method) on ICTWSS measures of union density, membership and coverage at country, sector and year level, weighted for relative size of country-industry-sector. M1 includes only country-sector fixed effects; M2 adds year fixed effects; and M3 includes composition (share of educational groups, age groups, share of women, share of medium and large firms, average hours worked). Standard errors clustered at country-sector-year for union density and union membership at sectoral level; and country-year otherwise. *, p<0.1, **, p<0.05, ***, p<0.01

Source: ESES 2002-2018

Part of this slight negative relationship between coverage rates and pay premia is likely to be due to workers who are not covered by collective bargaining arrangements differing more from the majority the greater the number of people in an economy who are covered. We already limit selection bias by restricting comparisons to the types of agreement that each cover at least 5 per cent of workers, but this can still be a relatively small group in a specific sector. Second, there are a great many other differences between countries in their pay setting arrangements that are related to the overall level of coverage and which may themselves lead to this negative association. For that reason it is more informative to study changes over time within a sector within a country. By doing that, other institutional factors than the coverage rate can be taken out of the equation as long as they remain constant over time.

Figure 11 shows the correlation between the change in the share of workers covered by any rather than no agreement, or a centralised rather than firm-level one (x axis), and the change in the corresponding pay premia. There is a clear positive relationship ($r=0.14$) between the change in the share of workers covered by any agreement and their pay premium relative to those who are not covered. This means that an increase/decrease in the coverage rate is associated with an increase/decrease in the relative pay of those covered compared to those who are not covered. There is no such clear relationship for the rate of workers covered by centralised agreements and their relative pay compared to those covered by firm-level ones ($r=-0.01$).

Figure 11 Relationship between a change from one wave to the next in the coverage rate and in the related premia



Note: the figure shows the relationship between wave-on-wave changes in the coverage rate and pay premia with each dot being a change between two waves for one country. Countries are only included where both comparators cover at least 5 per cent of workers.

Source: ESES 2002-2018

Table 4 shows the estimated change in the pay premia (in log points) for a change from 0 to 100 per cent in the coverage rate in a first-difference model, weighted for the relative size of the country-industry-year cluster. The base model includes no controls other than country-industry fixed effects; the second model adds year fixed effects to account for changes over time affecting all European workers; and the third model controls for the changing composition within a country-industry.

Table 4 looks at changes within a country-sector. On average, a 10 percentage point increase in the share of workers being covered by any rather than no agreement coincides with a 1.4 per cent increase in the pay of those who are covered by an agreement relative to those who are not covered. When accounting for common trends over time, this climbs to a 2.7 per cent increase and, in the final model, accounting also for other changes, we estimate a 1.8 per cent increase in the relative pay for a 10 point increase in coverage. A 10 point increase in the share of workers who are covered by a centralised rather than by a firm-level agreement is initially associated with an increase in the premium of those covered by centralised agreements of 0.7 per cent. When accounting for common trends over time and for other changes within a country-industry, however, this association is no longer statistically significant ($p < 0.1$).

Table 4 Association between changes in coverage rates and changes in premia in the private sector

		M1: Base	M2: add year	M3: Change in composition
Any over none N=333	Coefficient	0.137**	0.268***	0.183*
	s.e.	(0.0669)	(0.0704)	(0.0977)
	R squared	0.145	0.272	0.405
Centralised over decentralised N=190	Coefficient	0.0731**	0.0110	0.0177
	s.e.	(0.0363)	(0.0409)	(0.0560)
	R squared	0.135	0.195	0.341

Note: first-difference regression of the change in coverage rates on a change in the premia in log wages (using the counterfactual method) at country-sector-year level, weighted for relative size of country-industry-sector. M1 includes only country-industry fixed effects; M2 adds year fixed effects; and M3 includes changes in the composition (share of educational groups, age groups, share of women, share of medium and large firms, average hours worked). *: $p < 0.1$, **: $p < 0.05$, ***: $p < 0.01$

Source: ESES 2002-2018

We carried out several robustness tests on these models. As discussed above, we did not find an association between pay premia and trade union density. One reason for this is the variation of systems regarding the use of extension mechanisms where union membership can be relatively low while collective bargaining coverage is high. We also tested for sensitivity to removing individual waves of ESES from the sample. The positive association holds overall, regardless of which of the waves is left out.¹⁰

Finally, we ran the models separately by industry. This confirmed the general positive association between the share of workers covered by a collective agreement

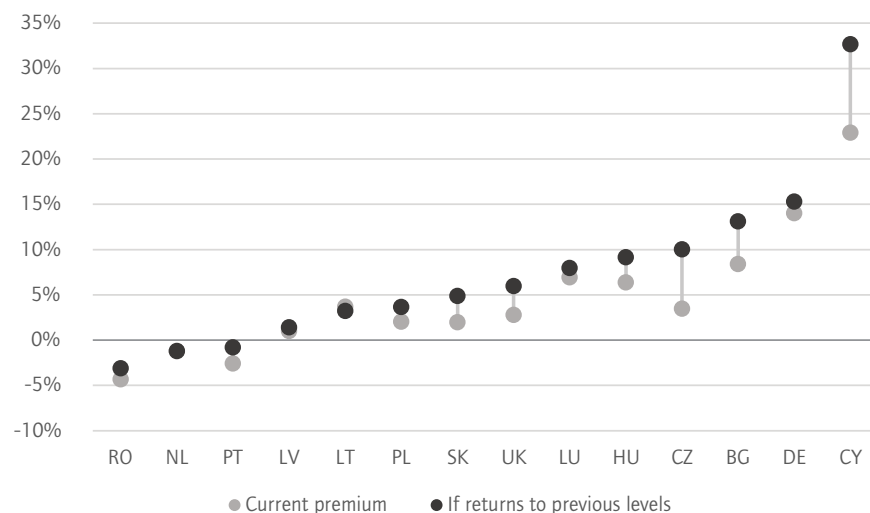
10. The effect is lowest, at 0.06 and no longer statistically significant ($p < 0.05$) when the change from 2010-2014 is left out.

and the relevant premium. Interestingly, however, this did not apply to hotels and restaurants, where the association was weakly negative. This means that premia are less dependent on coverage rates in this sector which, furthermore, stood out as having consistently high premia compared to other sectors (around 7 per cent on average).

We show that the decline in coverage rates that we see in many European countries, particularly those with already relatively low coverage and decentralised arrangements, is related to the benefits received when being covered by a collective agreement. On average, a greater decline in coverage is associated with a worsening relative pay position of those who are covered. If coverage rates in the private sector increased from the current average, of around 50 per cent in Europe, up to 68 per cent, as was the average in the 2002 wave, the average pay premium of being covered rather than not would be around 7 per cent rather than around 3.8 per cent currently.

Figure 12 shows this relationship more clearly for each country, by plotting how the pay premium for being covered would change if coverage levels in the last year in each country were returned to 2002 levels. This shows that, as coverage generally declines, the premium would generally increase. This highlights the large changes that have happened in Czechia, Cyprus, the United Kingdom and Bulgaria.

Figure 12 Premium for coverage by a collective agreement if coverage rates returned to 2002 levels, by country



Note: the premium in the last observed year (2018) is shown as the difference in wages for those who are covered from their counterfactual wage; while, on the basis of the predicted relationship between coverage and premia, the premia is predicted were coverage to return from the current level to the 2002 level.
Source: ESES 2002-2018

Conclusion

Over time, increasingly fewer European workers are covered by collective agreements. Coverage rates have declined in 17 of the 28 European countries, particularly so in those countries where coverage rates were already low or middling. At the same time, there has been a tendency towards greater centralisation in high-coverage countries and decentralisation elsewhere. The result is a polarisation with, on the one hand, countries where many workers are covered by increasingly centralised agreements; and, on the other, countries with fewer workers covered and, where they are covered, more by agreements operating at the level of the firm. There is a clear relation between high coverage and more centralised systems, indicating that the way to obtain high coverage rates is through higher-level bargaining.

At the same time, there has been much less of a clear trend in the evolution of the premia obtained by coverage – the extent to which the pay of workers covered by a collective agreement differs from that of similar workers who are not covered. Pay premia are generally positive, and they tend to be larger in those countries where relatively fewer people are covered. This is likely because, in countries where most workers are covered by a collective agreement, the uncovered stand out from the rest in many ways which may indicate higher earnings anyway regardless of coverage by an agreement. There is no clear evolution in how these premia vary over time, but there does seem to be a tendency towards a slight increase in the premium which stems from having centralised rather than decentralised agreements.

This paper makes use of ESES micro-level data directly to link the pay premia arising from being covered by a collective agreement to the extent of collective bargaining coverage, which can indicate the bargaining power of workers within the bargaining process. Importantly, in countries and industries where coverage rates are declining, the relative pay premia also tend to go down. In the EU as a whole, the share of workers not covered by any collective agreement increased by about 19 percentage points, from 11 per cent in 2002 to 30 per cent in 2018. Our estimates suggest that such a drop in the coverage rate, by 19 percentage points, is associated with a drop in the relative pay of those covered by such agreements of around 3.5 per cent compared to those not covered.

The analysis thus implies that strengthening collective agreements, besides the benefits this conveys in terms of worker representation and job quality more generally, is also an important lever in raising real wages and in contributing to a sharing of productivity and wealth in countries.

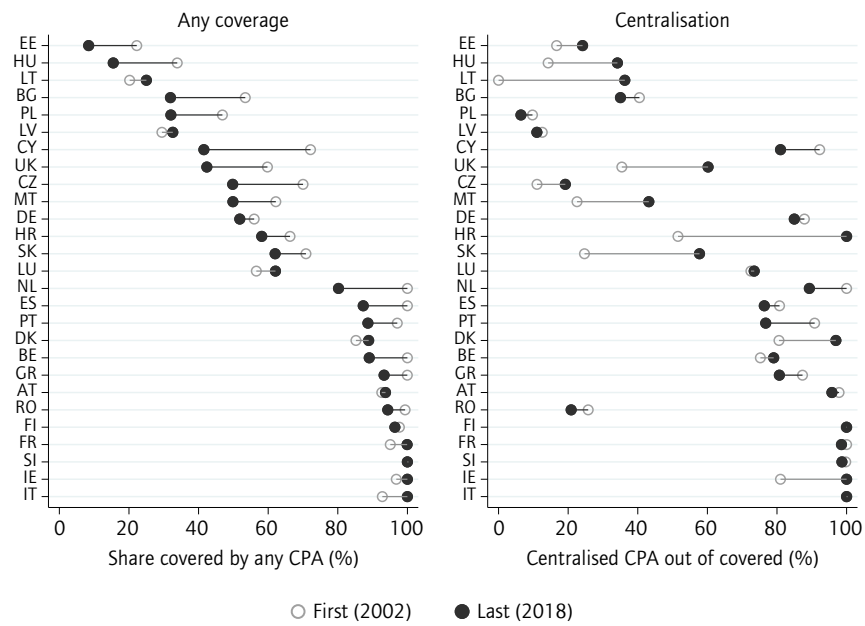
References

- Boeri T. and van Ours J. (2013) *The economics of imperfect labor markets*, 2nd ed., Princeton, Princeton University Press.
- Clegg H. (1976) *Trade unionism under collective bargaining*, Oxford, Basil Blackwell.
- da Paz Campos Lima M. (2019) Portugal: reforms and the turn to neoliberal austerity, in Müller T., Vandaele K. and Waddington J. (eds.) *Collective bargaining in Europe: towards an endgame*, Brussels, ETUI, 483–504.
- Fernández Rodríguez C.J., Ibáñez Rojo R. and Martínez Lucio M. (2019) Spain: challenges to legitimacy and representation in a context of fragmentation and neoliberal reform, in Müller T., Vandaele K. and Waddington J. (eds.) *Collective bargaining in Europe: towards an endgame*, Brussels, ETUI, 563–582.
- Fitzenberger B., Kohn K. and Lembcke A. (2013) Union density and varieties of coverage: the anatomy of union wage effects in Germany, *ILR Review*, 66 (1), 169–197.
- Garnero A. (2021) The impact of collective bargaining on employment and wage inequality: evidence from a new taxonomy of bargaining systems, *European Journal of Industrial Relations*, 27 (2), 185–202. <https://doi.org/10.1177/0959680120920771>
- Garnero A., Rycx F. and Terraz I. (2020) Productivity and wage effects of firm level collective agreements: evidence from Belgian linked panel data, *British Journal of Industrial Relations*, 58 (4), 936–972. <https://doi.org/10.1111/bjir.12525>
- Gürtzgen N. (2016) Estimating the wage premium of collective wage contracts: evidence from longitudinal linked employer–employee data, *Industrial Relations: A Journal of Economy and Society*, 55 (2), 294–322.
- Ioannou G. and Sonan S. (2019) Cyprus: a divided island – diverging collective bargaining patterns, weakened yet still standing, in Müller T., Vandaele K. and Waddington J. (eds.) *Collective bargaining in Europe: towards an endgame*, Brussels, ETUI, 109–130.
- Kallaste E. (2019) Estonia: simultaneous institutionalisation and waning of collective bargaining, in Müller T., Vandaele K. and Waddington J. (eds.) *Collective bargaining in Europe: towards an endgame*, Brussels, ETUI, 173–196.
- Katsaroumpas I. and Koukiadaki A. (2019) Greece: ‘contesting’ collective bargaining, in Müller T., Vandaele K. and Waddington J. (eds.) *Collective bargaining in Europe: towards an endgame*, Brussels, ETUI, 267–293.
- Keune M., Ramos Martin N.E. and Mailand M. (eds.) (2020) *Working under pressure: employment, job quality and labour relations in Europe’s public sector since the crisis*, Brussels, ETUI.
- Magda I., Marsden D. and Moriconi S. (2016) Lower coverage but stronger unions? Institutional changes and union wage premia in Central Europe, *Journal of Comparative Economics*, 44 (3), 638–656. <https://doi.org/10.1016/j.jce.2015.08.001>
- Müller T. and Schulten T. (2019) Germany: parallel universes of collective bargaining, in Müller T., Vandaele K. and Waddington J. (eds.) *Collective bargaining in Europe: towards an endgame*, Brussels, ETUI, 239–265.
- Müller T., Vandaele K. and Waddington J. (eds.) (2019) *Collective bargaining in Europe: towards an endgame*, Brussels, ETUI.
- OECD (2017) *Collective bargaining in a changing world of work*, in *OECD Employment Outlook 2017*, Paris, OECD Publishing, 125–186.
- OECD (2018) *The role of collective bargaining systems for good labour market performance*, in *OECD Employment Outlook 2018*, Paris, OECD Publishing, 73–122.

- OECD (2019) *Negotiating our way up: collective bargaining in a changing world of work*, Paris, OECD Publishing. <https://doi.org/10.1787/1fd2da34-en>
- Ramos R., Sanromá E. and Simón H. (2021) Collective bargaining levels, employment and wage inequality in Spain, *Journal of Policy Modeling*. <https://doi.org/10.1016/j.jpolmod.2021.09.006>
- Stanojevic M. and Poje A. (2019) Slovenia: organised decentralisation in the private sector and centralisation in the public sector, in Müller T., Vandaele K. and Waddington J. (eds.) *Collective bargaining in Europe: towards an endgame*, Brussels, ETUI, 545–562.
- Stephan G. and Gerlach K. (2005) Wage settlements and wage setting: results from a multi-level model, *Applied Economics*, 37 (20), 2297–2306.
- Vandaele K. (2019) Belgium: stability on the surface, mounting tensions beneath, in Müller T., Vandaele K. and Waddington J. (eds.) *Collective bargaining in Europe: towards an endgame*, Brussels, ETUI, 53–76.
- Visser J. (2019) ICTWSS Data base. version 6.1., Amsterdam Institute for Advanced Labour Studies. <https://www.ictwss.org/downloads>
- Waddington J., Müller T. and Vandaele K. (2019) Setting the scene: collective bargaining under neoliberalism, in Müller T., Vandaele K. and Waddington J. (eds.) *Collective bargaining in Europe: towards an endgame*, Brussels, ETUI, 1–32.
- Zwysen W. (2022) Wage inequality within and between firms: macroeconomic and institutional drivers in Europe, Working Paper 2022.02, Brussels, ETUI.

Appendix

Figure A1 Difference in the share of workers covered by different agreements from 2002 to 2018



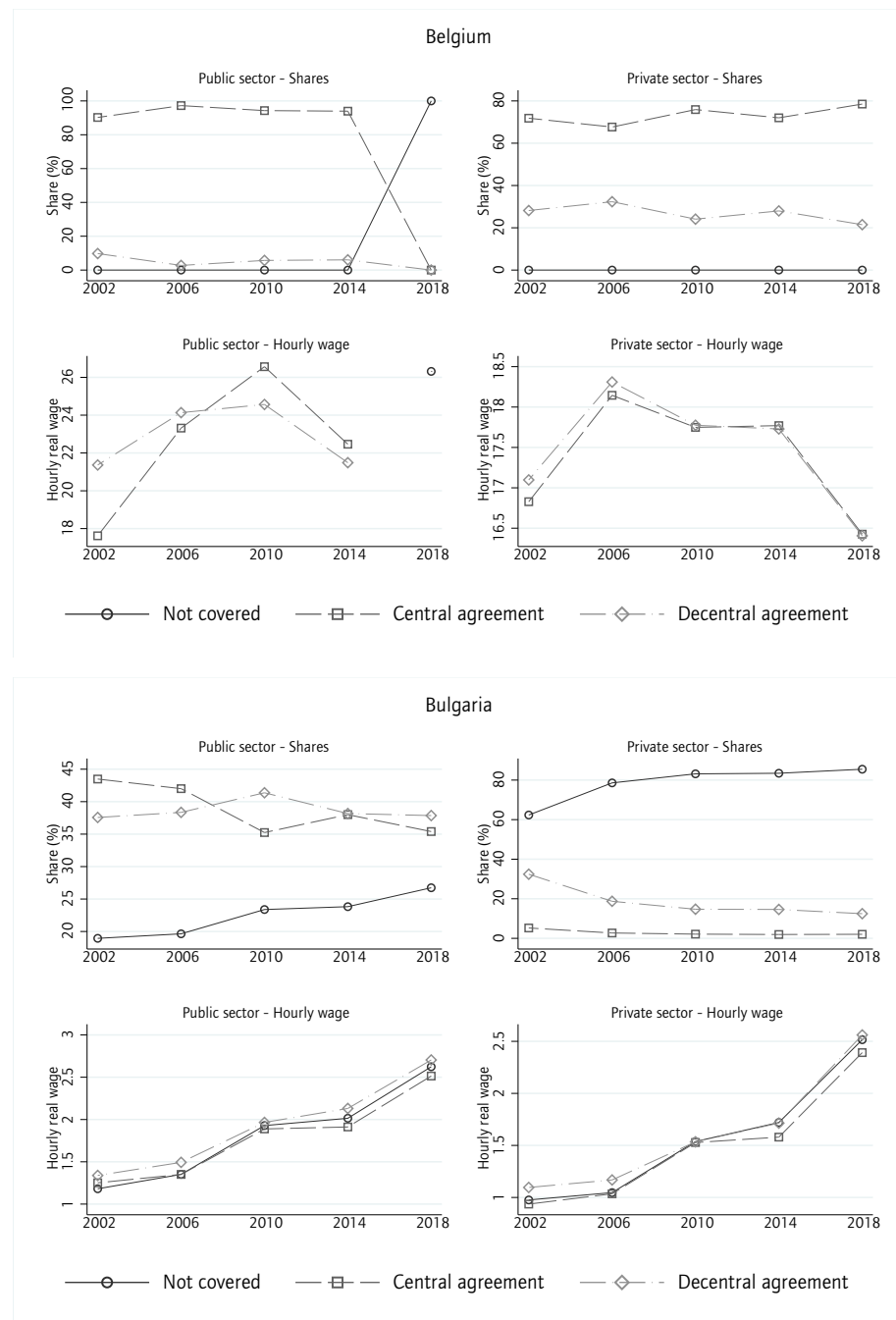
Note: the figure shows the difference in the share of workers covered by collective pay agreements from 2002 (2006 in Malta, 2010 in Croatia and Poland) to 2018, in percentage points. The EU average is the average of all countries weighted by their number of workers, as shown in the Eurostat SES tables.

Years were dropped if the change from any covered to not covered is over 30 percentage points from one wave to the next in absolute values. Malta changed from 100 per cent in 2002 to 62 per cent in 2006; Poland from 100 per cent in 2006 to 47 per cent in 2010. The dropped years were the first or last and, given the rest of the series, seemed to be outliers.

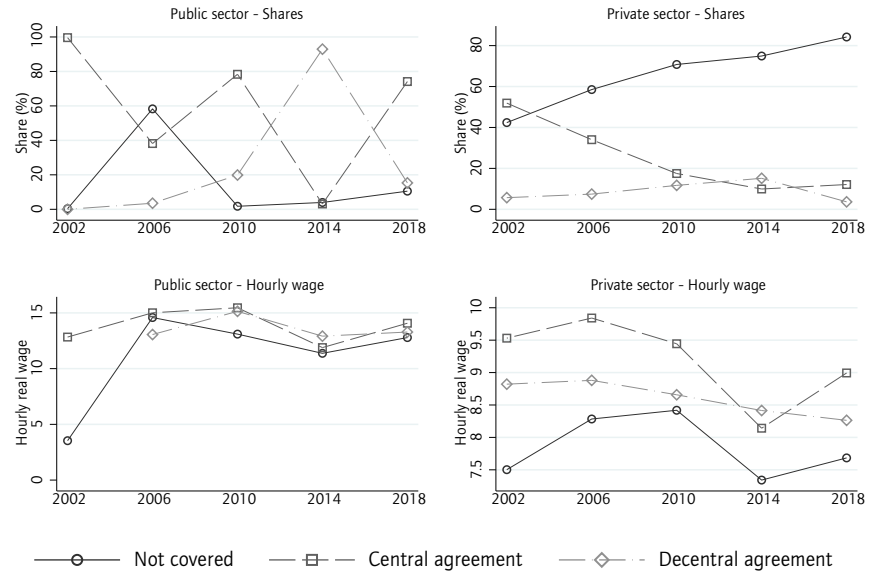
Source: EARN_SES_AGT01 for 2002, EARN_SES06_01 for 2006, and EARN_SES18_01 for 2018

Appendix A: Country profiles

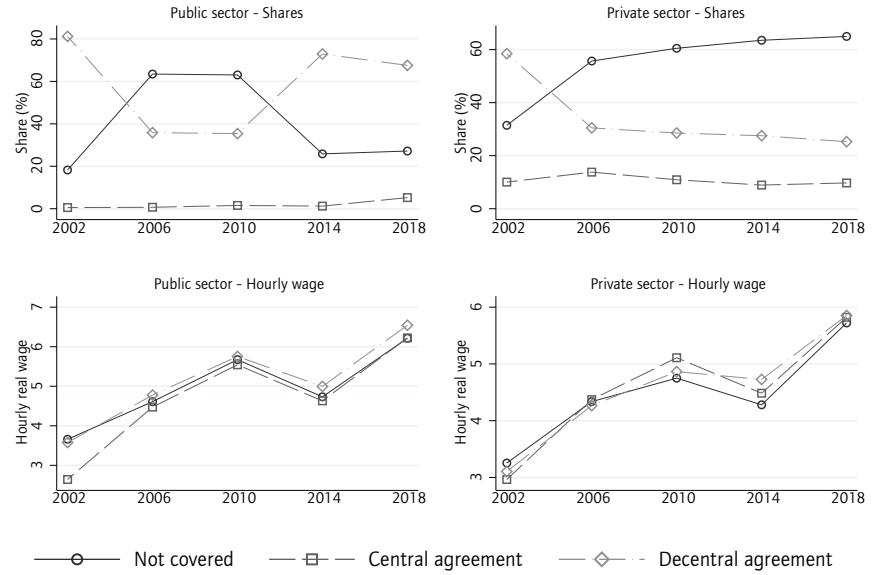
This Appendix shows a vignette of four graphs per country, showing the shares of the public and private sectors covered by centralised agreements, decentralised ones or where no agreement is in place; and the related predicted hourly wages if everyone in each sector was covered by a centralised agreement, a decentralised one or were not covered by an no agreement.

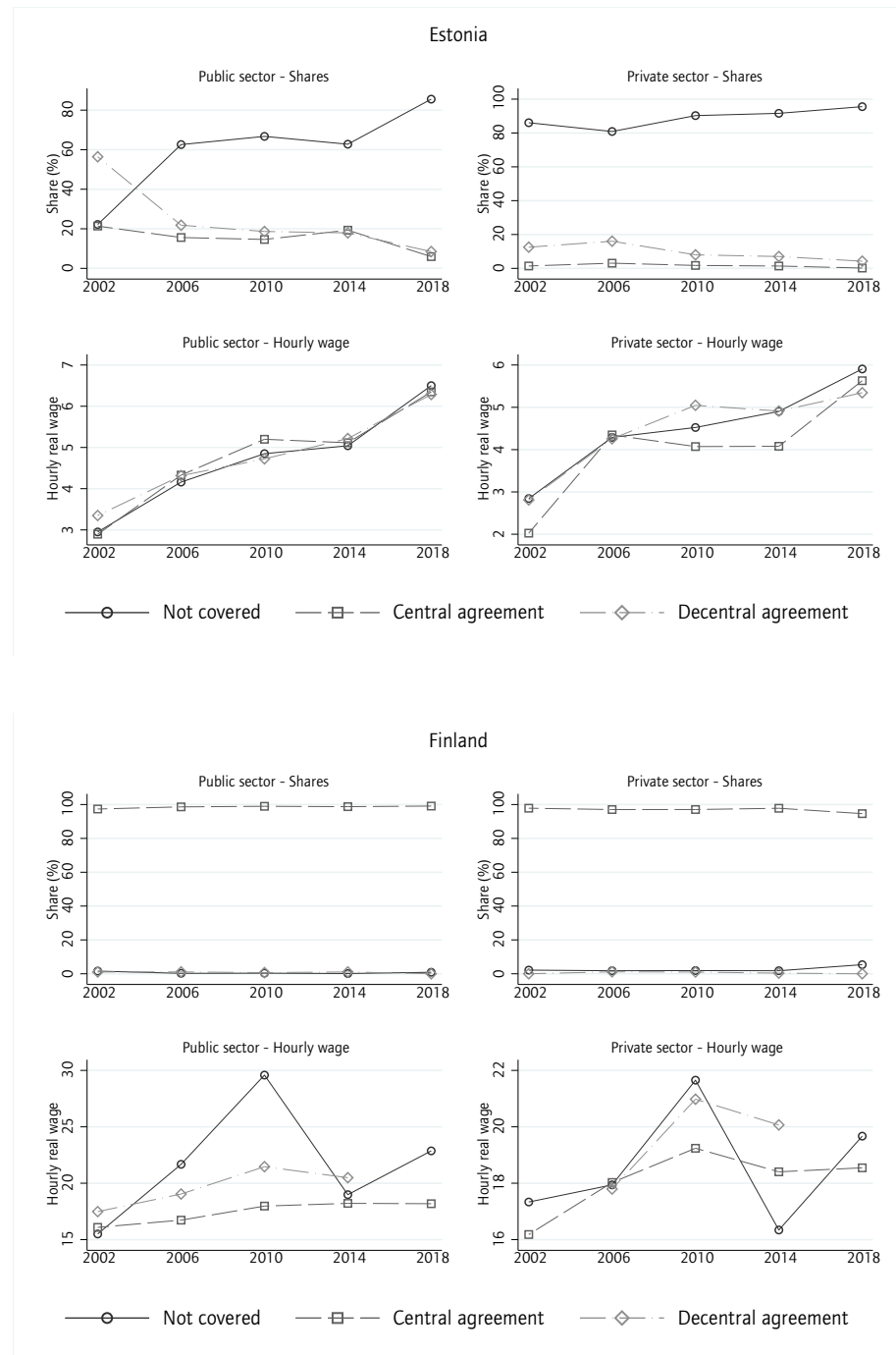


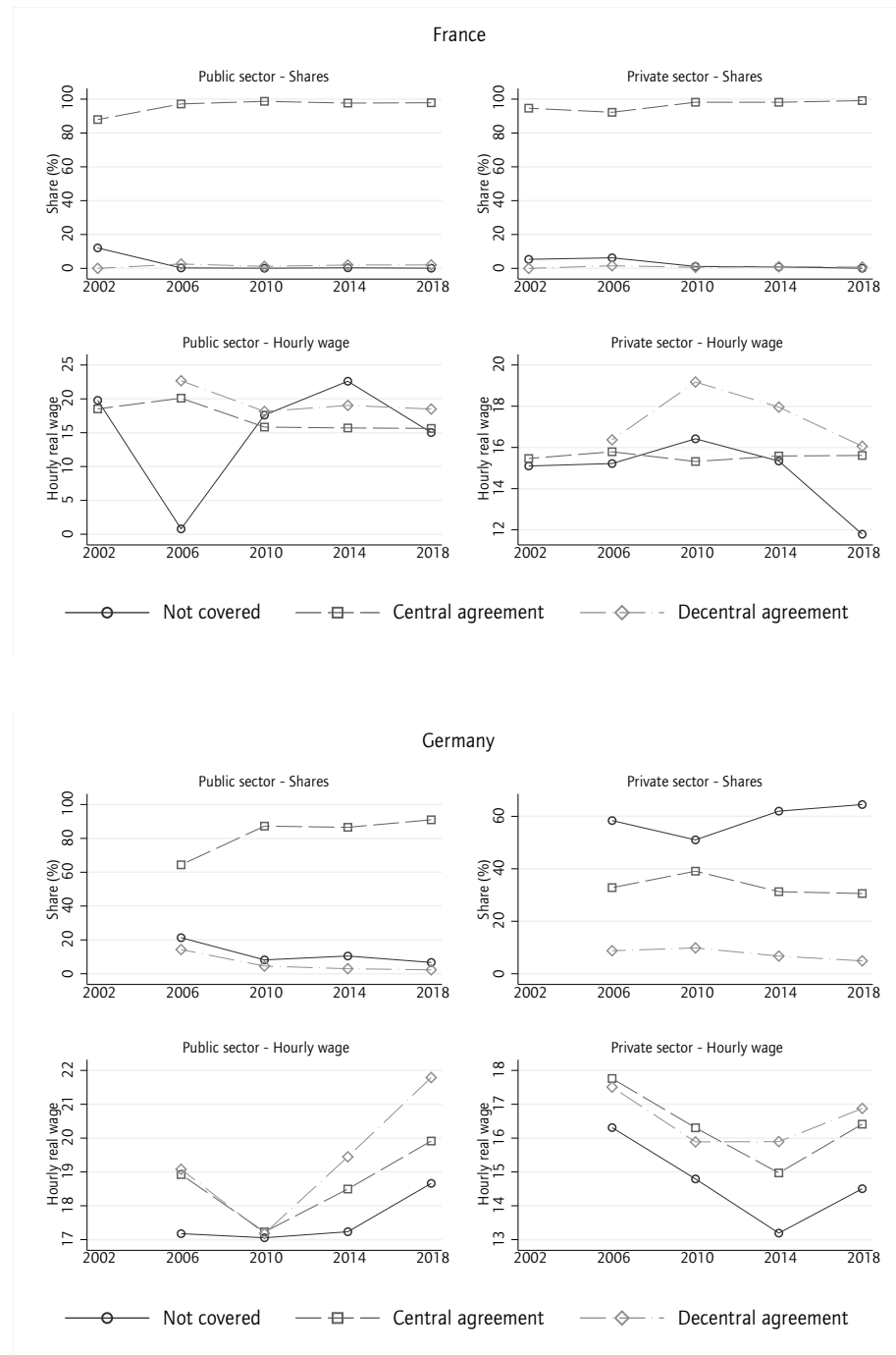
Cyprus



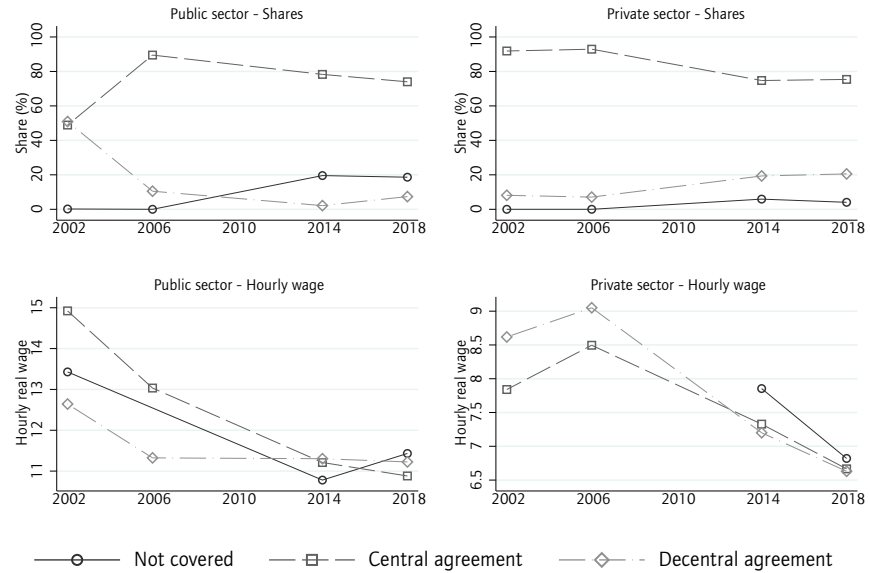
Czechia



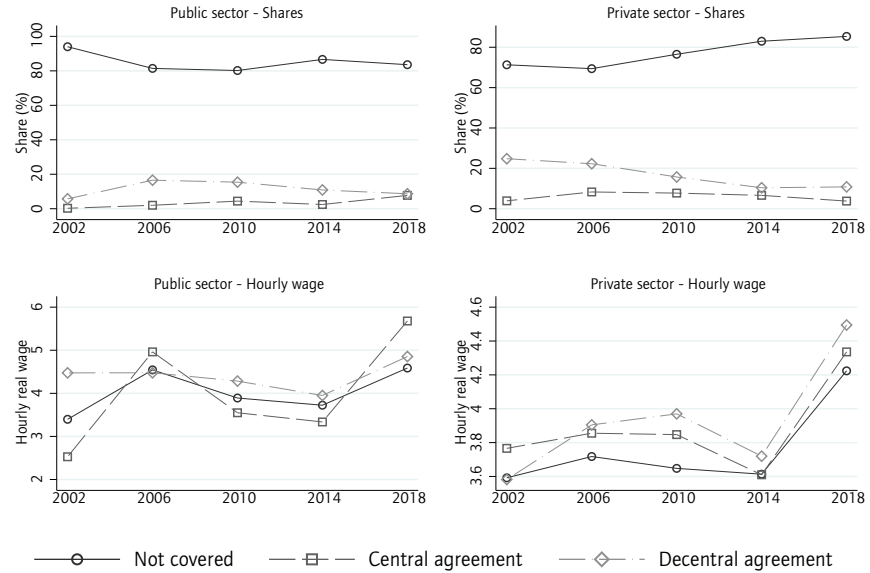


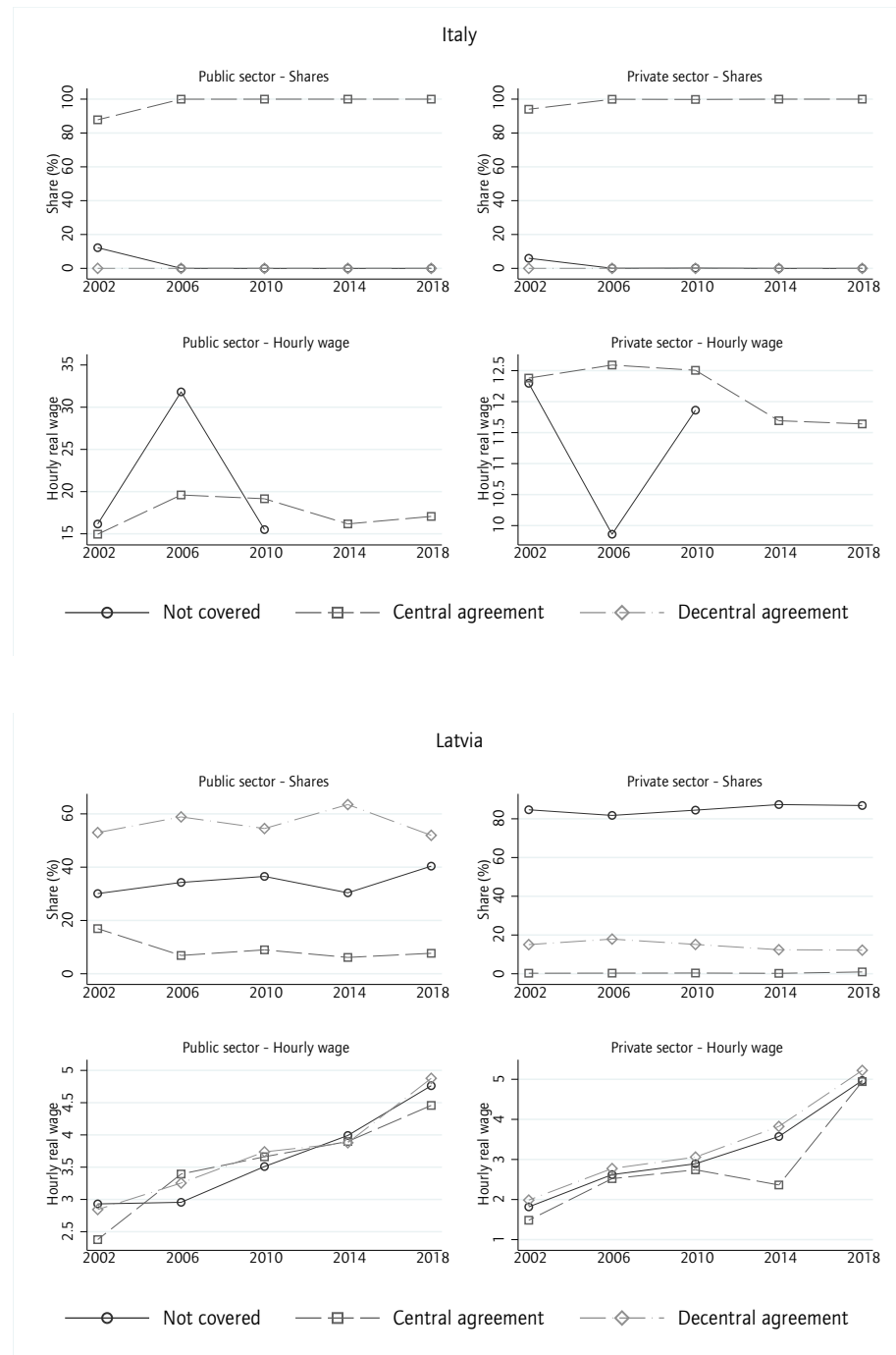


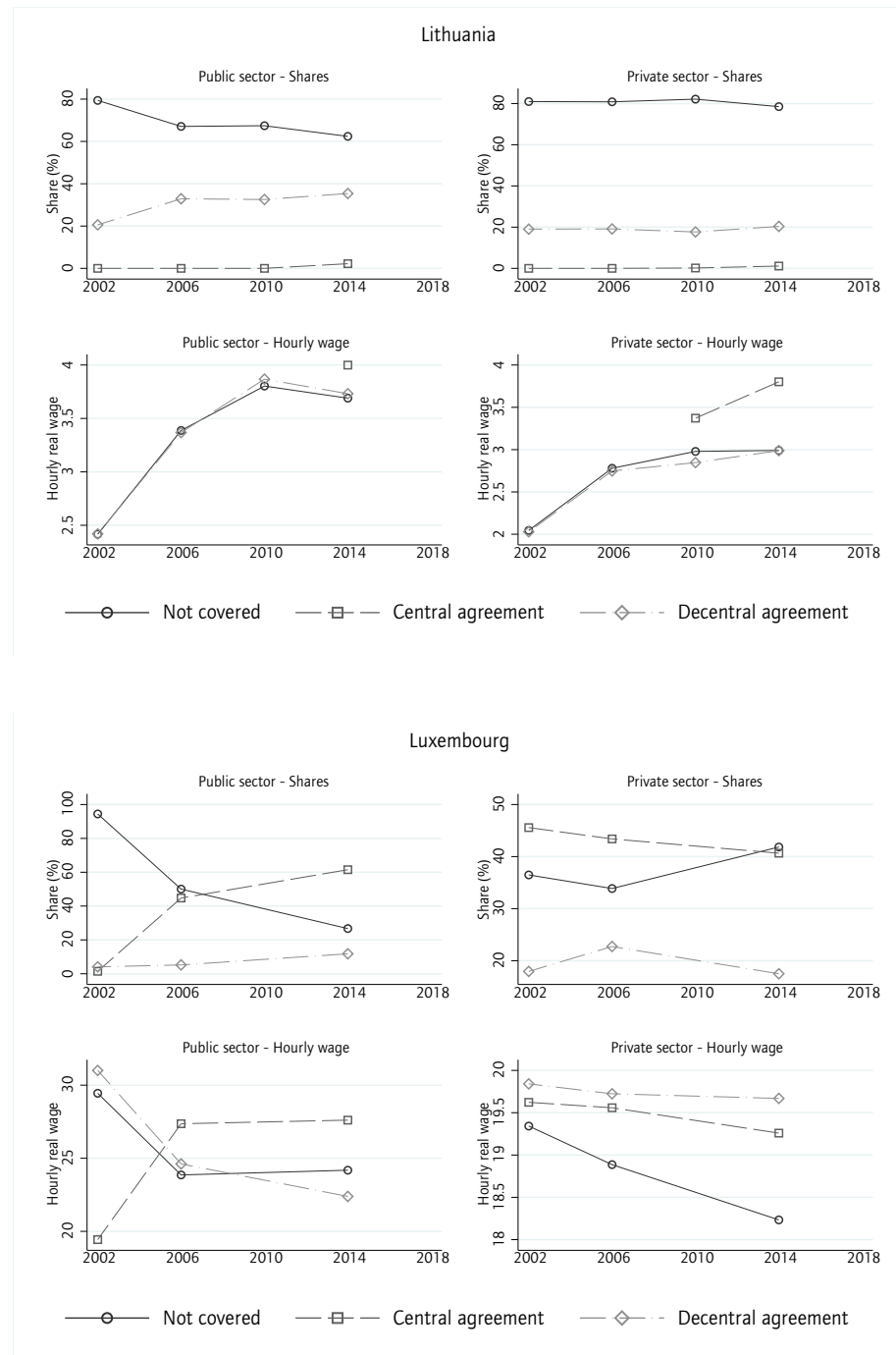
Greece

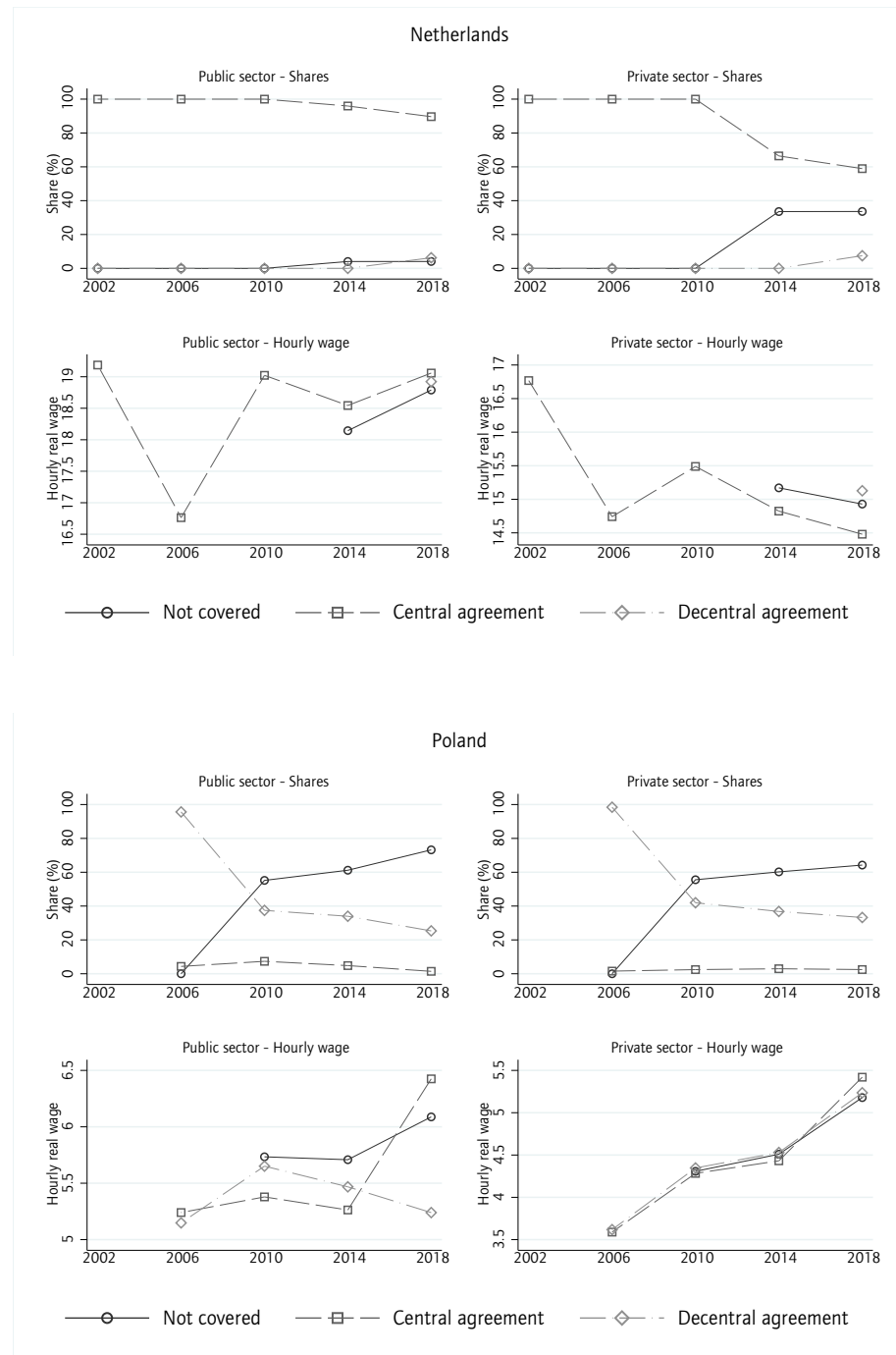


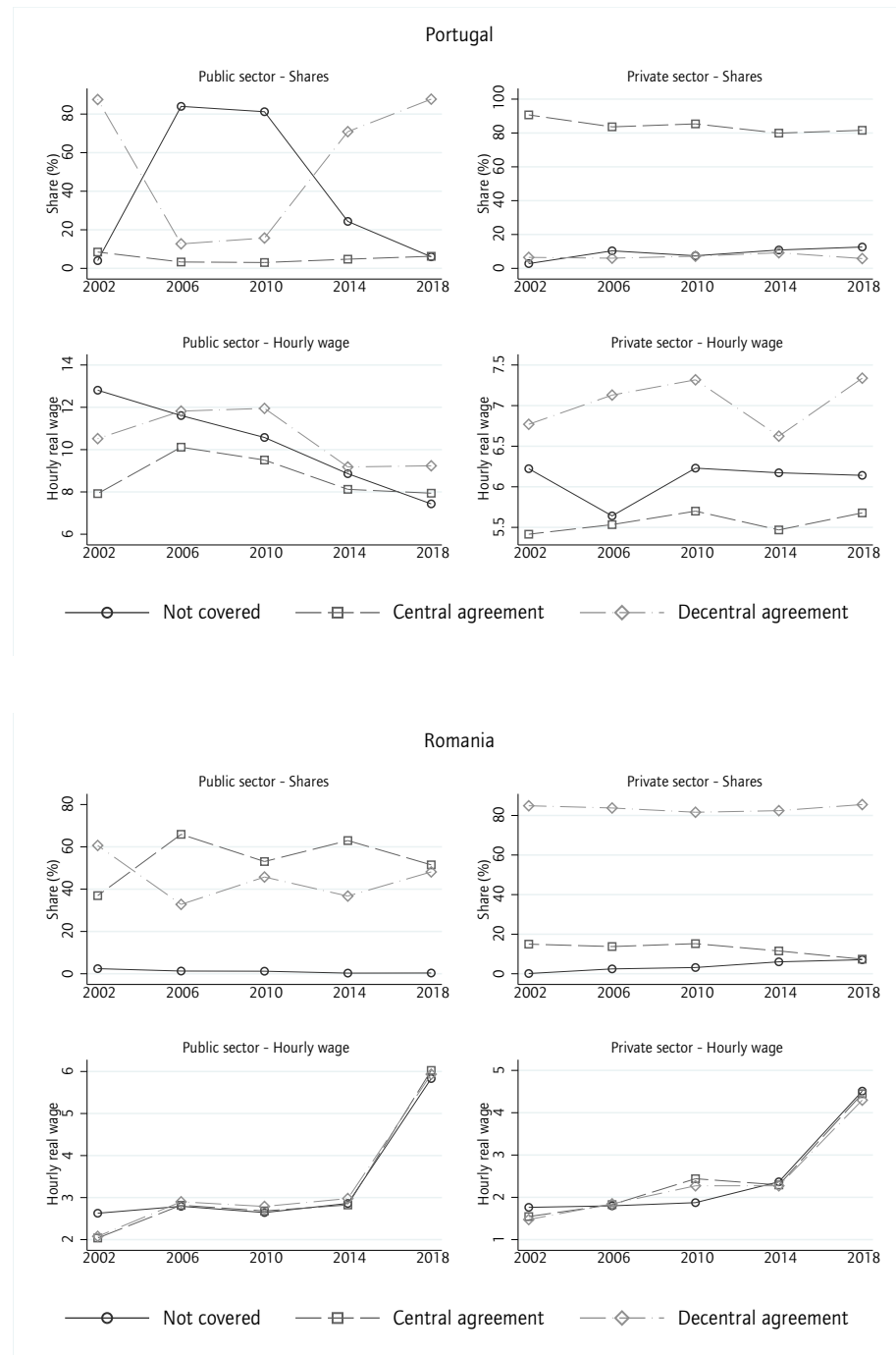
Hungary

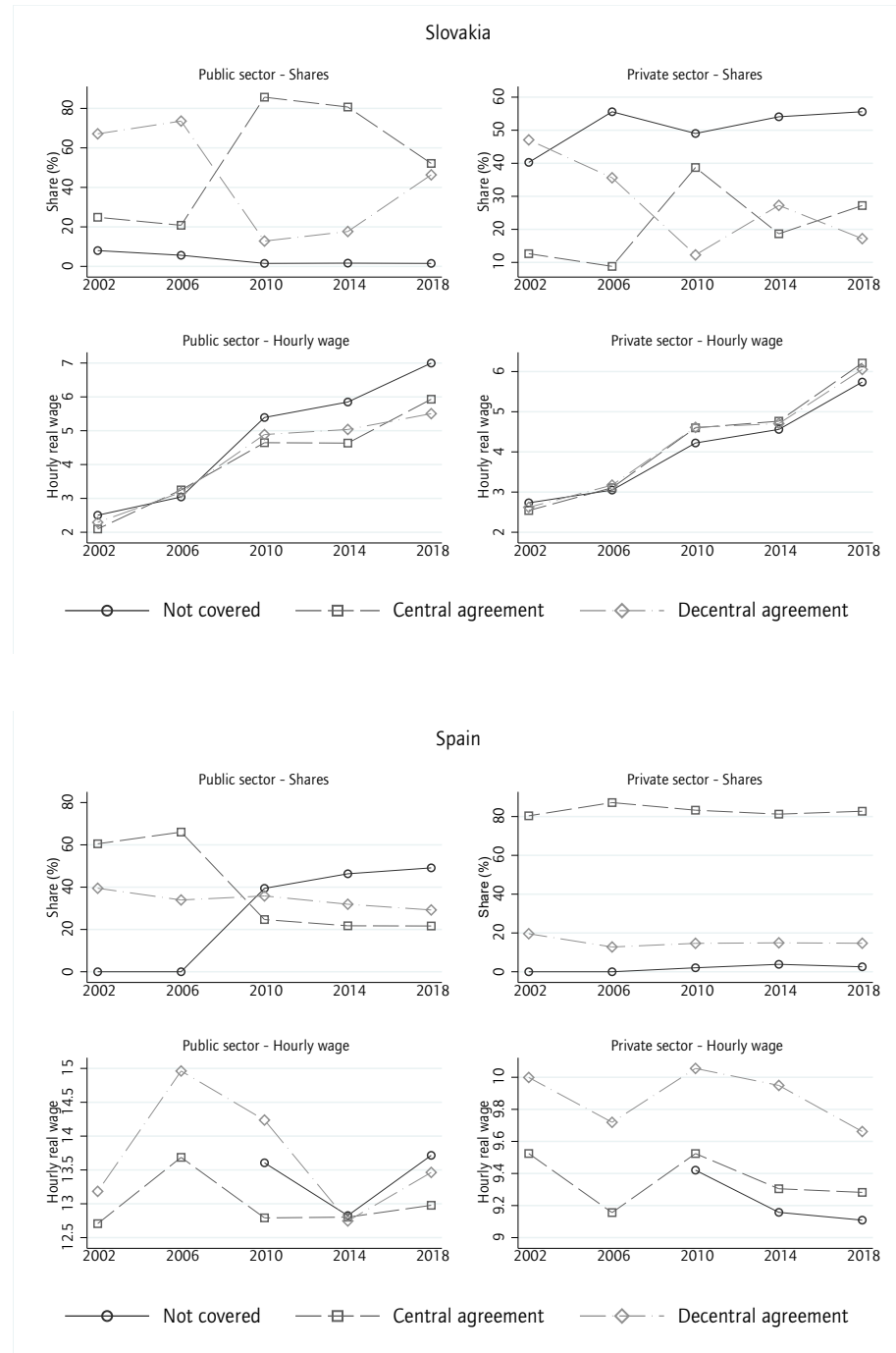


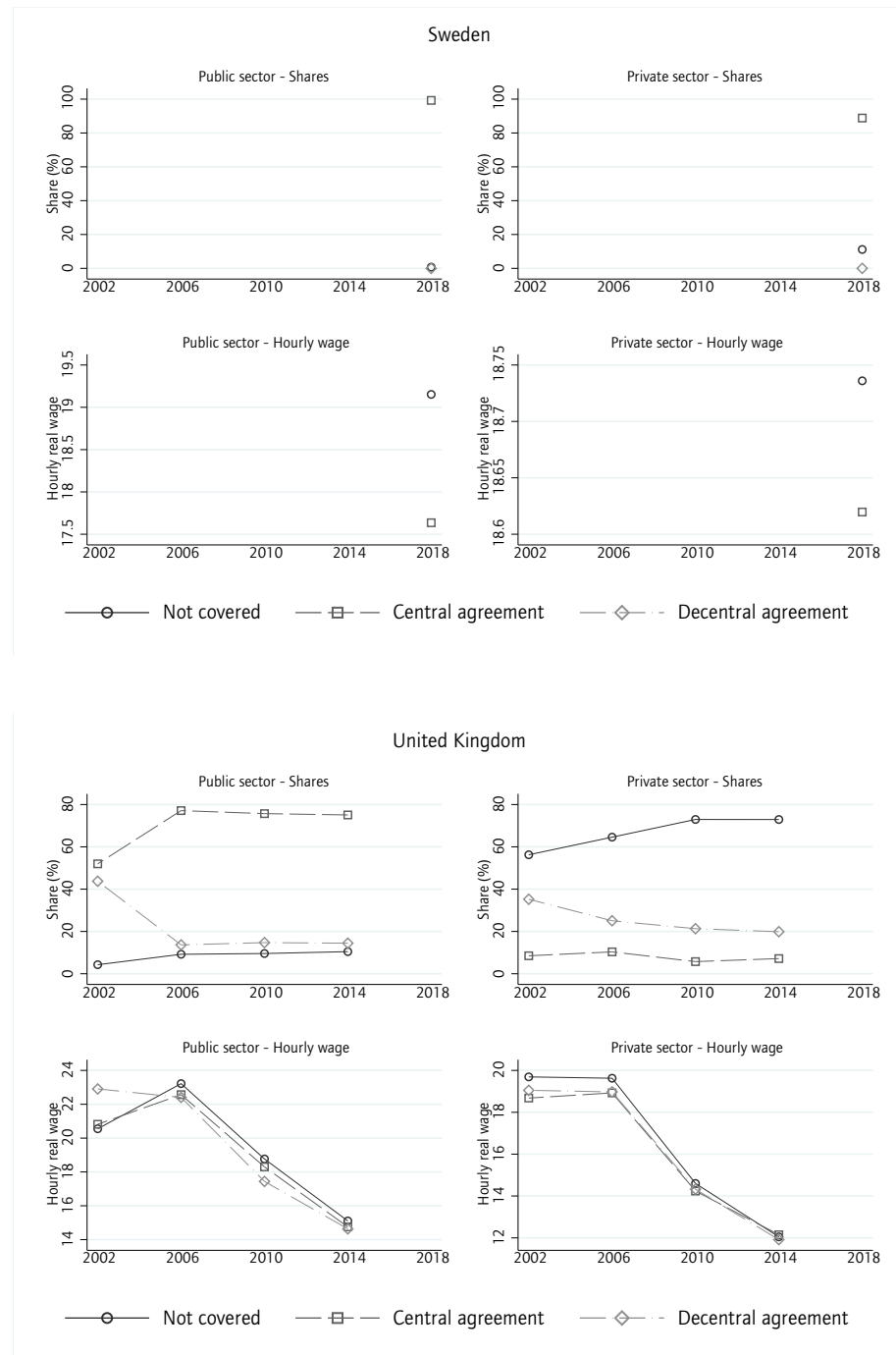












Appendix B: Methodological extension

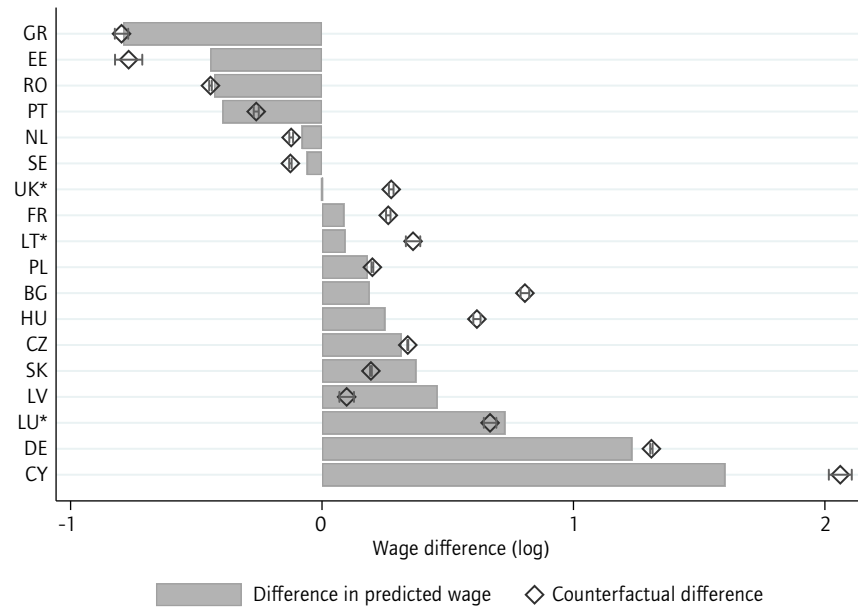
Table A1 Compare the premium from different methods of estimating

	Covered by any rather than no agreement			Covered by central rather than decentral		
	Average difference	Counterfactual difference	Regression adjusted	Average difference	Counterfactual difference	Regression adjusted
BG	0.29	0.11	0.04	0.03	0.02	-0.08
CY	0.16	0.17	0.17	0.21	0.16	0.06
CZ	0.08	0.03	0.03	-0.11	-0.01	0.00
DE	0.22	0.09	0.11	-0.07	0.00	0.00
EE	0.07	-0.06	0.00			-0.17
FI						
FR	0.10	0.03	0.03			-0.04
GR	-0.10	-0.08	-0.07	0.01	0.02	0.02
HU	0.20	0.05	0.04	-0.08	0.01	-0.02
IT						
LT	0.16	0.02	-0.01			0.21
LU	0.10	0.05	0.04	-0.01	-0.01	-0.01
LV	0.14	0.04	0.07			
NL	-0.21	-0.02	-0.01	-0.49	-0.02	-0.04
PL	0.07	0.02	0.01			
PT	-0.18	-0.04	-0.06	-0.62	-0.24	-0.24
RO	-0.06	-0.06	-0.04	0.05	0.03	0.02
SE	-0.06	-0.01	-0.01			
SK	0.09	0.06	0.04	-0.08	-0.05	0.00
UK	0.00	0.01	-0.02	0.05	0.05	0.00
Average	0.11	0.04	0.04	-0.10	-0.02	-0.02

Note: the table shows the estimated premia over the private sector, averaged over years per country, as the average difference in wage, the counterfactual difference, and the difference after regression adjustment.
Source: ESES 2002-2018

Table A1 shows, for the private sector, the average difference in pay (1 and 4), the pay premia when using the counterfactual method (2 and 5) and the pay premia when using a regression adjustment where wage is predicted in a separate regression for each type of CPA agreement and the predictions are then compared after averaging over the whole distribution. At the country-year level the correlation between the regression adjustment and counterfactual method is 0.84 for any compared to none; and 0.82 for central to decentral. The correlation between the counterfactual method and the average difference is 0.68 for any to none and 0.89 for central to decentral.

Figure A2 Relation between the difference in predicted wage and the counterfactual difference of being covered (95% C.I.)



Note: the figure shows the premia of being covered by any rather than no agreement in the private sector in 2018 (*: 2014) as estimated through the counterfactual method and through regression adjustment.
Source: ESES

Figure A2 shows the relation in the last year between the difference in predicted wages – obtained from regressing wages on individual and work characteristics separately for each type of coverage and then predicting wage for all workers in a country if they were covered by this agreement. Comparing the predicted wages averaged over the whole sample indicates what the differences would be if everyone was covered by one or the other. The counterfactual differences allow for a more specific difference between two types as they take into account the residual distribution by assigning the same percentile of residuals in the counterfactual wage. As they compare only the two groups the characteristics of other workers are not included. Both estimates correlate 0.83 over countries and time.

Appendix C: Coverage between ESES and ICTWSS

Table A2 compares coverage rates reported in ESES with estimates based on administrative data and national surveys found in OECD-AIAS ICTWSS database. This is available only for a limited set of countries/years. The coverage found in ESES figures is higher by 25 per cent or less in most countries, which can be considered broadly consistent with the bias towards larger enterprises and with the feature of the ESES to classify all workers in a workplace as covered. At the same time, however, ESES appears to over-report coverage in a number of countries to the extent that suggests a measurement error in either the ESES or other data. The over-reporting seems particularly large in Greece and Romania. The discrepancies in these countries appear in the years that followed the decentralized of bargaining systems in these countries from 2010. Greece ended the cross-industry agreements, notably replacing negotiated wage floors with a statutory minimum wage, and allowed opt outs from the sectoral agreements. The discrepancy seems to be explained by companies continuing to report coverage by national agreements in ESES in 2014 and 2018. The reported figures for sectoral and firm level agreements plausibly correspond to the estimates reported in ICTWSS and in other sources (Katsaroumpas and Koukiadaki 2019). Romania dismantled cross-industry agreements in 2011, and it made collective bargaining mandatory only in companies employing more than 20 employees. Again, the discrepancy seems to be explained by the reported coverage of sectoral and national agreements, which comes primarily from publicly-owned establishments. The firm-level coverage in ESES is only 18 per cent higher than the estimates provided in ICTWSS.

High discrepancies with ICTWSS, suggesting a degree of over-reporting in ESES, can be found also for Lithuania, Ireland, Poland and Slovakia. Over-reporting in Lithuania and Poland is consistently high over the years and seems to be related to an over-estimate of firm-level agreements. Sectoral agreements play a role in Slovakia, particularly in the public sector. This is reflected in the ESES measures, but both sectoral and firm-level coverage appears to be over-estimated in the country. The high over-estimate in Ireland seems to be related to measurement errors and to inconsistencies in ESES. Coverage levels vary widely in individual years without any apparent link to developments in the country.

Finally, ESES seems to over-estimate, albeit to a much lower degree, coverage in Latvia, the UK, Slovenia and Czechia. The figures for Latvia are consistent in an earlier year for which ICTWSS estimates are available (2006). In the UK and Czechia, ESES reports higher coverage consistently across the years. The discrepancies in Slovenia are related to sectoral coverage with alternative estimates suggesting that the measurement error may well be lower (see Stanojevic and Poje 2019).

Table A2 Coverage measures: ESES and ICTWSS compared, 2018 or the most recent year for which ICTWSS data is available

	UnadjCov	AdjCov	Share_any	Overreporting*		Note
	(ICTWSS)	(ICTWSS)	(ESES)	UnadjCov	AdjCov	
AT_2018		98.0	93.7		95.6	
BE_2002	100.0	53.8	100.0	100.0	185.9	
BG_2010	24.6	33.4	35.4	144.1	105.9	
CY_2014		45.8	45.1		98.4	
CZ_2014		31.7	49.8		157.3	
DE_2018		54.0	53.9		99.9	
DK_2014	82.0	74.0	89.74	109.4	121.3	
ES_2014	72.1	72.7	86.5	119.9	119.0	
EE_2014		18.6	20.07		108.1	(2015 in ICTWSS)
FI_2014		89.3	98.8		110.7	
FR_2018		94.0	99.9		106.3	
UK_2018	26.0	26.0	42.4	163.0	163.0	
GR_2014	15.0	21.9	99.1	660.1	451.7	
HR_2014	49.1	49.7	59.7	121.7	120.2	
HU_2014	22.8	22.8	21.5	94.4	94.4	
IE_2018		34.0	100.00		294.1	(2017 in ICTWSS)
IT_2018		80.0	100.0		125.0	
LT_2018		7.1	25.0		352.2	
LU_2010		59.0	62.6		106.1	
LV_2014		24.0	39.9		166.4	
MT_2018		50.1	49.87		99.6	(2017 in ICTWSS)
NL_2018	76.7	76.7	80.2	104.6	104.6	
PL_2010	17.0	18.6	46.8	275.6	252.4	
PT_2014	60.6	74.0	86.5	142.8	116.9	
RO_2014	16.6	23.0	94.96	573.1	412.9	(2015 in ICTWSS)
SK_2014		30.0	60.62		202.1	(2015 in ICTWSS)
SI_2014		67.5	100		148.1	(2015 in ICTWSS)
SE_2018		90.0	92.74		103.0	(2016 in ICTWSS)

Note: *coverage in ESES as a percentage of the respective indicator in ICTWSS. Adjusted coverage corrects for the proportion of workers excluded from collective bargaining. In bold: countries/years where the share of covered workers in ESES exceeds both ICTWSS coverage indicators by more than 25 per cent.
Source: ESES 2002-2018 and ICTWSS (Visser 2019)

Appendix D: Comparison of SES micro-level and aggregate data

This section compares ESES micro-level data used for the analyses here with the aggregate data as used in the section on ‘Collective bargaining in Europe at a glance’ and made available via the Eurostat portal. The comparisons are for the whole sample, both public and private sector. There is no micro-level data available for some of the countries for which there is aggregate data (Austria, Denmark, Ireland, Croatia, Malta and Slovenia) or it is not available for all years (Germany 2002, United Kingdom 2018, Luxembourg 2010 and 2018). This comparison pertains only to those country-years present in both the aggregate and the micro-level data.

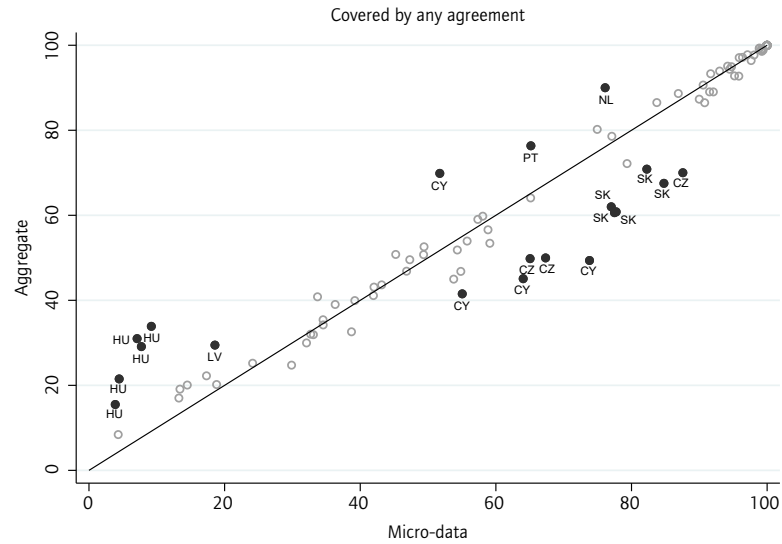
Both datasets are generally comparable with a correlation of 0.96 in the case of being covered by any type of agreement and 0.94 regarding coverage by a central agreement. The correlation in changes over time between the two datasets is weaker, but still reassuring at 0.63 for changes in the coverage rate by any agreement and 0.74 in the change of the coverage rate by a central agreement.

Figure A shows the relationship between the coverage rate in the aggregate and the micro-level data and highlights the outliers (more than 10 percentage points difference). Hungary, Cyprus, Czechia and Slovakia stand out as being consistently over- or under-estimated in the micro-level data. Importantly, the deviations are not systematic on average.

Figure A4 shows this same comparison for being covered by a centralised agreement. Here the share of workers covered is systematically higher in the aggregate data, sometimes considerably so, than in the micro-level data.

Finally, Figure A5 shows the relationship between changes from one wave of the ESES to the next. This again shows that the two datasets are quite consistent, but there are some exceptions. Cyprus especially differs in the micro-level data from the aggregate.

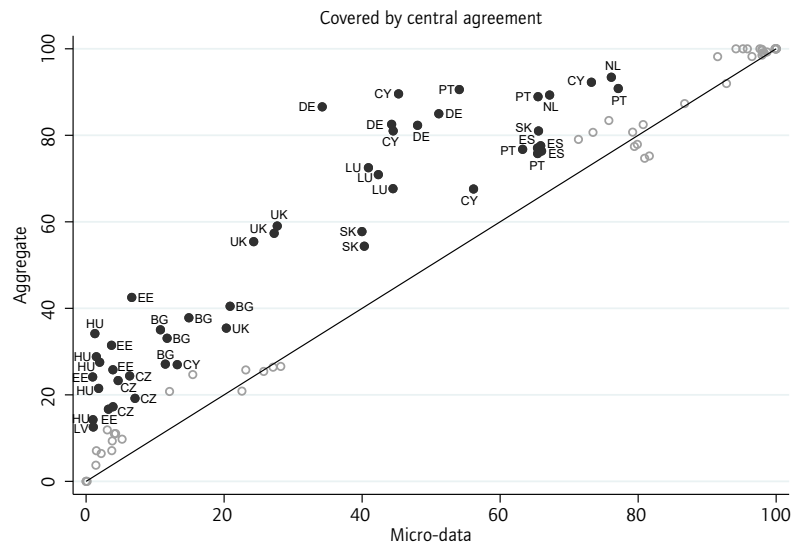
Figure A3 Comparison of the share of workers in the full economy covered by any type of collective pay agreement in aggregate and micro-level data in each year



Note: the figure plots the coverage rate for each country-year in the micro- and aggregated data. The darker, named markers indicate the absolute difference between micro- and aggregated data is above 10 percentage points.

Source: ESES 2002-2018

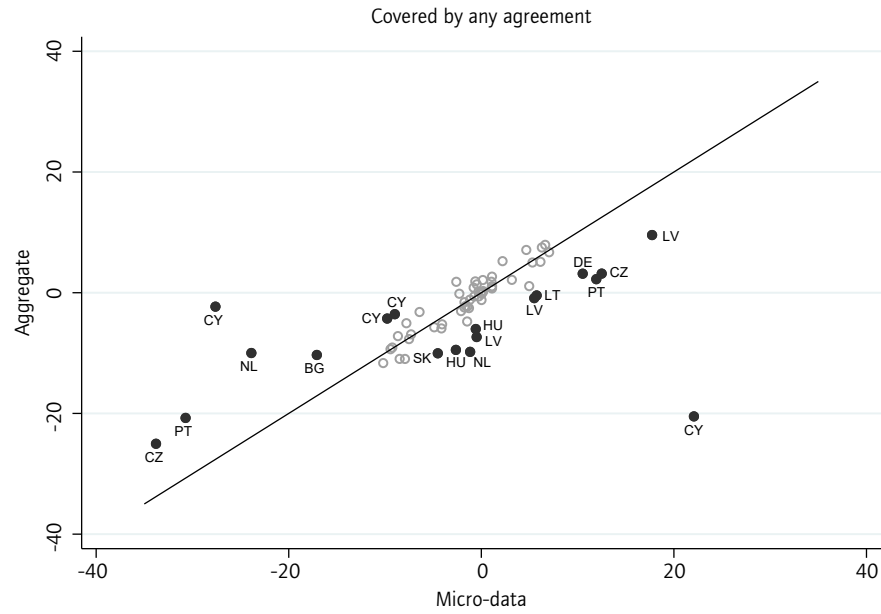
Figure A4 Comparison of the share of workers in the full economy covered by a centralised collective pay agreement in aggregate and micro-level data in each year



Note: the figure plots the coverage rate for each country-year in the micro- and aggregated data. The darker, named markers indicate the absolute difference between micro- and aggregated data is above 10 percentage points.

Source: ESES 2002-2018

Figure A5 Comparison of wave-by-wave changes in the share of workers covered by any agreement, in aggregate and micro-level data in every year



Note: the figure plots the change in coverage rates for each country-year in the micro- and aggregated data. The darker, named markers indicate the absolute difference between changes in the micro- and aggregated data is above 5 percentage points.
Source: ESES 2002-2018

**European
Trade Union Institute**

Bd du Roi Albert II, 5
1210 Brussels
Belgium
+32 (0)2 224 04 70
etui@etui.org
www.etui.org