Employers' associations and trade unions: co-existence or more?

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Abstract

We discuss the interrelationship between membership in employers' associations and the existence of trade unions. The analysis is based on both aggregate data for 13 European countries for 1980–2019 and firm-level data for 12 of these countries from the European Company Survey (ECS) for 2013 and 2019. Our findings suggest that at the aggregate level there is potentially a dependence between membership in the two types of organizations despite the fact that membership in the two organizations appear to respond differently to macroeconomic conditions and to different institutional parameters. The firm-level data suggest that such a dependence might exist in some countries while the two organizations simply co-exist in most countries. The firm-level analysis confirms a number of stylized facts found in other analyses; larger and longer-established firms are more likely to belong to an EA and firms enforcing a collective agreement signed outside the remit of the firm are also more likely to be members of an EA and have union presence. The analysis is fraught with difficulties as, *inter alia*, the evolving nature of the two types of organizations makes it more difficult to ascertain the type of co-habitation between the two.

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1   Introduction

What is the purpose of a study on trade union membership in a collection of papers on employers' associations? The answer lies in another question: would employers' associations exist if trade unions did not or put differently has the demise of trade union membership had an impact on employers' association membership? This paper looks at the determinants of membership in employers' associations and trade unions and the interrelationship between membership in both institutions.

Employers' associations (EA) are defined as groups of employers with an interest in labour and product market issues (Demougin *et al.,* 2019; Martinelli, 2001). It might seem obvious that a party to a negotiation should be stronger, the more powerful its counterpart. Thus, a trade union (TU) would want to be stronger, the more powerful the employer is. Wage negotiations, for example, between a weak trade union and concentrated employers can result in low wage increases (Benmelech *et al.*, 2022). The power of the employer can be proxied by the rents the employer extracts, her monopsonistic power, her ability to pass on cost increases to prices. Recent research suggests that strategic interactions between firms and their collusion on personnel-related matters (e.g no-poaching and non-compete agreements) can increase firms' labour market power and affect employment outcomes (Card, 2022). The participation of an employer in an EA would make such features more likely (Martins, 2020). Thus, one would expect that trade unions facing members of employers' associations will need to be more powerful. Similarly, an employer would want to be stronger, the more powerful the TU is during negotiations. The power of a TU can be proxied by its ability to cause disruption (Rosen, 1969). This is itself a function of *inter alia* the financial standing of the union and the number of its members. The above might appear simplistic as sometimes the counterpart is so strong that trying to get more powerful can have little impact on outcomes. Thus, for example, faced with the rise of large companies being able to produce abroad in the event of a dispute, the TU can exercise little countervailing power (Azar *et al.*, 2019; Manning, 2021).

Despite the above links between the two types of organizations, the analysis on TU density has not, in general, included EA density amongst its determinants.[1] Neither has the limited analysis on EA density investigated, in general, the impact of TU density on EA membership. Exceptions include the work of Traxler (2004) and Brandl & Lehr (2019) with aggregate data, and more recently that of Jirjahn (2022) who using firm-level data for Germany finds that the share of union members is positively associated with the probability that the employer belongs to an EA.

We are interested in finding out whether this latter association holds for more countries than Germany. Ideally, one would have data on whether a firm belongs to an EA, information on the specific EA and on the union density in the firm. Such data are, however, not readily available in a harmonised fashion for a number of countries. To the best of our knowledge, the closest available alternative is the firm-level data of the European Company Surveys (ECS) conducted by Eurofound. The ECS data are sample surveys of establishments with more than 10 employees from a number of European Union (EU) countries. The surveys contain information on whether a firm belongs to an EA for the purposes of collective bargaining and on whether

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[1]The corporatist nature of industrial relations is, however, included by Blanchflower and Freeman (1992) and Ebbinghaus and Visser (1999) amongst the determinants of trade union membership but this is a wider concept than membership in an employers' association. As Crouch (1985) mentions 'capital may appear as an individual firm in an exchange, not necessarily as a group or association of firms, while labour is always collectively organised.'.

an official employee representative (ER) is present. The ECS data also contain information on union density but as this is available only for a very small sub-sample of firms we do not use it. We focus therefore on finding out whether, conditional on a number of other determinants of EA membership and ER presence, there is an association between the two. As a motivating point for our empirical establishment-level analysis we start off by looking at the relationship between EA and TU density using aggregate-level data for the period 1980 to 2019. The main source of the data is the OECD/AIAS ICTWSS database (OECD & AIAS (2021). To maintain some homogeneity in data reliability of both aggregate and firm-level analysis, we only look at 12 of the first 15 European Union (EU) member states for the firm-level analysis and also include Norway in the aggregate-level analysis.[2]

From our analysis we obtain the following four main results: first, EA density shows sensitivity to macroeconomic variables; EA density is countercyclical with respect to inflation and procyclical with respect to export intensity. EA density also depends on institutional variables; there is a positive association with the extension of agreements and with the extent of regulation in the network sector of the economy. Second, the aggregate analysis reveals a positive association between EA density and TU density. Third, in a few countries the firm-level data show a direct association between ER presence and EA membership. Fourth, while a number of EA membership determinants appear common across countries, the mechanism through which the common determinants materialize appear to differ. While, for example, larger firms are more likely to belong to an EA in all countries, the reason for which this happens in the countries in which there is a positive association between EA membership and ER presence is because larger firms are more likely to have an ER present. Further research is needed to understand why in some countries there is a positive interrelationship between EA membership and EA presence while in others there isn't.

In what follows, we first report a number of stylized facts on EA and TU density (Section 2) and then we discuss the determinants of EA membership and TU density thus putting in place a framework for our analysis (Section 3). Next, in Section 4, we turn to look at whether there is an interrelationship between EA membership and TU density at aggregate level. In Section 5, we present and discuss the results of the establishment-level analysis. Finally, Section 6 summarises and concludes.

2   Stylized facts on EA and TU density

The empirical investigation of TU density, and even more so EA density, is fraught with difficulties as data are often approximations (Schnabel, 2020; Visser, 1991) and different sources lead to substantially different estimates (Breda & Ghio, 2022). Furthermore, the issue of whether TU density, or EA density for that matter, capture the strength of the party has also been questioned (Metten, 2021). Notwithstanding the above measurement difficulties, a number of stylized facts emerge from exploring the data on EA and TU density. EA density is defined as the percentage of employees who work for employers belonging to employers' associations over

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[2]The countries we look at are, in alphabetical order: Belgium (BEL), Denmark (DNK), Finland (FIN), France (FRA), Germany (DEU), Ireland (IRL), Italy (ITA), Netherlands (NLD), Norway (NOR), Portugal (PRT), Spain (ESP), Sweden (SWE) and the UK (GBR). In other words, Austria and Greece have been excluded. We exclude Austria as membership in EAs is compulsory and thus looking at determinants for membership is futile and we exclude Greece as there are large gaps in the data on both EA and trade union membership.

all employees. TU density is defined as density amongst employees.

Table 1 uses the OECD/AIAS ICTWSS data to show average employers' association density per decade, in the interval 1960 to 2019, for the 13 countries we look at together with the rank of each country in each decade. The rank of countries remains relatively constant over time; the Spearman rank correlation coefficient for any two adjacent decades lies between 0.87 and 0.97 (with a p-value in every instance lower than 0.01). More specifically, the cross-country coefficient of variation is relatively low - it is approximately half that for trade union density presented below. The fact that in 11 out of the 13 countries the EA density is higher than 65% in the most recent decade affirms the relatively low cross-country variation. Nevertheless, differences exist both between and within countries.

In most countries, membership in employers' associations is voluntary, a notable exception is Austria – which for that reason is not being studied here. Despite the voluntary nature of these organizations, however, the persistent cross-country differences in the extent to which firms participate in them, imply that institutional features or systematic differences in firms' characteristics across countries lie behind the membership decision. The difficulty of cross-country comparisons of data on trade union density have often been discussed (Hyman, 2001). Comparisons of data on EA density both across countries and over time are fraught with even more difficulties than the same comparisons for trade union density as, apart from the difficulty in collecting the data, already mentioned above, associations themselves are not comparable. In some countries – see Jirjahn (2022) for Germany - employers' associations are focused on labour market-related matters while in others, see, for example, Gooberman *et al.* (2020) for the UK, EAs represent both labour and product market interests.

The rankings of countries in terms of TU density are also relatively stable. Table 2 uses the OECD/AIAS ICTWSS database to report average TU density per decade, in the interval 1960 to 2019, for the 13 countries we look at together with the rank of each country per decade. While average densities have changed over time, and the dispersion of densities has increased (Calmfors *et al.*, 2001), country ranks have not changed by much; the Spearman rank correlation coefficient for any two adjacent decades lies between 0.82 – for the earlier two decades – and 0.95 (with a p-value in every instance lower than 0.01).

Cross-country variations in TU membership arise both because in some countries several establishments have no union members and because some establishments are only partly organized. Lack of data prevent us from showing this information for all countries over time. Figure 1 uses data from the responses of employee representatives to the 2019 European Company Survey (ECS) to show the distribution of establishments by the percent of employees who are unionized. France and the UK have a large share of establishments in which no employees are unionized. In Spain, in around 50% of establishments less than a fifth of the workforce is unionized. The above suggest that we are looking for determinants that can explain both cross-country and within country variations.

3   Determinants of EA membership and TU density

The above prepare the ground for the discussion of possible determinants of EA and TU membership as an organizing framework of our aggregate and micro-level analysis.

3.1 Determinants of EA membership

The true reasons for which employers participate in EAs are best found by asking firms directly. Such information is not, however, readily available. It is usually only case studies that explicitly identify a reason for entry or, perhaps more noisily, exit from an EA.[3] Traxler (1991) proposed that we look at what he called "The logic of employers' collective action" following a two-pillar approach: first, we ask why employers need EAs and second, having established they need them, we ask whether it is possible for them to organize themselves in an EA. Using this framework, we could match the first pillar to a within-country analysis and the second pillar to an analysis across countries and sectors.

The determinants of within-country variations in EA membership are mainly related to the sector a firm belongs to: manufacturing firms are more likely to belong to an EA. In addition, larger firms and firms which have been established for longer are more likely to belong to an EA (Jirjahn, 2022). The way work is organized at the workplace could make managers more or less likely to seek advice on payment issues or other matters of the employment relationship (Jirjahn, 2022). So, for example, if work is organised in teams or a significant share of the workforce works part-time, managers might have more difficulty in assessing the contribution of individual workers and thus could be more eager to join an EA to get advice on best practices.

Furthermore, some institutional features are likely to have a varying impact on firms and could thus lead to within-country variation. One such feature is the extension of collective agreements to firms that do not belong to EAs (Traxler, 2004). While this could lead to free riding by some firms, the effect is expected to vary by firm size. Small firms are more likely than large firms to free ride as the former do not have a great interest to participate in an EA given, they are unlikely to have a large influence on the outcome of negotiations (Barnett, 2013). Firms might also consider it good for their market reputation that they belong to an EA (Jirjahn, 2022). In addition, the presence of an organized workforce might also have an impact on the probability of EA membership; employers facing an organized workforce could seek support from an EA (Traxler, 2004).

Cross-country differences in EA membership are related both to differences across countries in the composition of economic activity and the structure of businesses i.e. in differences in the factors determining within-country variation but also to institutional factors. The institutional factors include the level at which bargaining mostly takes place; in countries with extensively decentralised only bargaining, firms are less likely to belong to an EA; Ireland and the UK where bargaining is much more decentralised than in other European countries have amongst the lowest EA densities as seen in Table 1. An additional factor that could contribute to explaining cross-country differences in EA membership is the extent to which EAs contribute in a formal, or an informal matter, in policy formulation. In some countries, (e.g., Finland, Netherlands, Norway and Spain) for example, there is a tripartite council (government, employers and unions) which discusses social and economic policies in a systematic fashion.

Changes over time in EA membership have taken place and these are not all in one direction. For most countries these changes in EA membership have not been as large as for trade

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[3]The best-known example of an exit is that of the Italian automotive company Fiat which left Confidustria, the peak EA in Italy, in 2012 (FT, October 3, 2011). The head of Fiat, Mr Marchionne, reasoned the move explaining that an agreement with the unions for more flexible working arrangements had been reneged upon. "Fiat, which is engaged in the creation of a major international group with 181 plants in 30 countries, cannot afford to operate in Italy in an environment of uncertainty that is so incongruous with the conditions that exist elsewhere", Mr Marchionne mentioned. The move did not go unnoticed by the markets; Fiat shares declined by 4% on the news.

unions. One of the macro variables acknowledged in the literature as having an impact on EA membership is globalization. On the one hand, one could expect that an increased share of exports in a company's sales would increase the probability of wanting to belong to an EA to benefit from a network that could prove useful for expansion abroad. On the other hand, if a company shifts its focus from the domestic market, it might think there is little benefit from engaging in a domestic EA. In addition, foreign companies active in a country might be less familiar with the industrial relations workings in the country and might not want to participate in EAs (Jirjahn, 2022).

3.2   Determinants of TU membership

The determinants of within-country variation in union membership are mainly related (Calmfors *et al.*, 2001; Schnabel, 2020) to sectoral affiliation: the public sector and the secondary sector show higher trade union density. In manufacturing it is easier to organize workers as they are assembled in the same areas, a large share of blue-collar workers is employed, and occupational hazards exist against which workers wish to protect themselves (Hirsch, 1980). Differences also exist in the propensity of trade union affiliation by firm size: larger firms, which are also less likely to belong to the informal sector and where unions are more likely to be present, have higher union density. The variation of firms in their exposure to domestic and international competition is also expected to have an impact on TU density; the more intense the competition the lower the unionisation rates as the rents to be shared with the employers are more limited. Aspects related to workforce composition (e.g., share of part-time employees, share of women employees, age distribution) are also relevant in the discussion of union membership as not all groups of workers feel the same closeness to the workplace: part-time employees or employees working from home, for example, feel less connected (Barrero *et al.*, 2022).

In addition, but related to the sectoral composition argument, social custom effects appear to be stronger in some regions and sectors explaining why employees do not free ride (Nolan and Cripps, 1993; Beynon *et al.*, 2020; Murphy, 2020). Social custom effects are distinct to personal characteristics – which have in general not been found to explain much of within country variation (Schnabel & Wagner, 2007) – as they require a 'network' and some mass to materialize. Social custom effects are compatible with the picture presented in Figure 1 as a mass of membership per establishment is required for social effects to kick in.

The above factors also contribute to explaining cross-country differences in trade union density. It is, however, institutional-related parameters which seem more likely to explain such differences. The ones found in most of the literature include institutions pertaining to unemployment insurance funding (the Ghent system), to the dominant level of collective bargaining, rules regarding the ability to unionize at the workplace, the extension or otherwise of collective agreements (Ebbinghaus & Visser, 1999). In countries following the Ghent system of national insurance (Belgium, Denmark, Finland, and Sweden) unions are responsible for collecting and distributing unemployment benefits which leads to higher union density in these countries. Centralised collective bargaining implies on the one hand, that firms have no reason to not recognise unions at the workplace as all employers pay the same wage (Ebbinghaus & Visser, 1999). On the other hand, however, and especially in the presence of rules extending agreements to all firms, centralised collective bargaining makes employees more likely to free ride. As discussed by Schnabel (2020) the impact of bargaining centralization on trade union density has not been

settled either theoretically or empirically. Rules preventing the establishment of a union in certain firms (e.g. small firms) also explain low union density in countries with a prevalence of small firms (e.g., Southern European countries).[4] The extension of agreements to all firms in a sector is likely to be associated with more free riding by workers and thus with lower union density.[5]

One type of regulation found to be associated with trade union membership is the existence of legislation to protect employees (Checchi & Lucifora, 2002). If this legislation in effect substitutes for union protection, this could contribute to lower union density.[6] Recent evidence suggests, however, that unions themselves might be providing some form of security to workers as union members are found to be more satisfied with their job than non-union members even though all employees are covered by the same EPL (Blanchflower *et al.*, 2022).

The existence of what Ebbinghaus and Visser (1999) call a *corporatist exchange relationship* might also enhance trade union density and be able to explain cross-country differences in the latter. We hypothesise here that this corporatist exchange depends on EA density. The argument is that union density is higher, the higher employer association density. This thus suggests that not only employers are more likely to organize when faced with an organised workforce - see previous subsection - but also workers are more likely to organize when employers belong to an EA.

The ranking of countries by trade union density might not have altered much over time, as mentioned in Section 2, nevertheless there are changes and furthermore besides the adjustments in rank there is also variation in the actual membership figures. Business cycle variables (inflation, unemployment) as well as changes in the determinants of the level of trade union density mentioned above (e.g., sectoral composition of output, workforce composition, institutional variables), the development of alternative forms of worker representation (e.g., works councils) or the downgrading of the importance of tensions between management and workers have been identified as explanations for changes in trade union density over time.[7]

As for the procyclical or otherwise behaviour of TU density, the latter is expected to increase with rising prices as inflation erodes the purchasing power of wages and moreover it affects the incomes of all workers regardless of seniority. Furthermore, a decline in the unemployment rate could lead to an increase in union membership as employees can afford union dues easier. On the other hand, however, a decline in the unemployment rate makes the protection of income and employment provided by unions less necessary as employers are more willing to grant wage increases and generate jobs. Unions are more necessary when individuals are losing their jobs suggesting that union membership is countercyclical. Existing empirical results appear in general to suggest that union membership is positively associated with inflation while the association with the unemployment rate is often not significant (Ebbinghaus & Visser, 1999; Schnabel, 2020).

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[4]Rules on company size necessary for a trade union to be active can be found in, for example, France which has a threshold of 11 employees for the establishment of a union (https://www.worker-participation.eu/National-Industrial-Relations/Countries/France/Workplace-Representation).

[5]Table 3 in the Data Appendix shows 2018 data for TU density together with the type of extension system followed in each country. The data suggest that there is not an unconditional one-to-one association between the two.

[6]Using the index constructed by the OECD on employment protection legislation (EPL), which varies between 0 and 6, and takes higher values the more protective of employment the legislation is, Figure 1, in the Appendix, suggests that there might indeed be some negative unconditional association between EPL and TU density.

[7]The Social Inequality module of the International Social Survey Programme (ISSP) suggests a decline in the perception of tensions between management and workers over time.

The above discussion leads us to first take a look at the aggregate evidence on the interrelationship between EA and TU density which we do in the next section.

4 Aggregate evidence on the interrelationsship between EA and TU density

We now turn to look at the interrelationship between EA and TU density using the OECD/AIAS ICTWSS, 1980-2019 country-level data. To this effect we estimate a seemingly unrelated regression equations (SURE) model to get more efficient estimates than simple OLS (Greene, 2003).

$$EAD_{it} = \beta_0 + \beta_1 UD_{it} + \beta_2 \pi_{it} + \beta_3 u_{it} + \beta_4 XP_{it} + \beta_5 NR_{it} + \beta_6 EXT_{it} + \beta_7 TC_{it} + \epsilon_{1it} \quad (1)$$

$$UD_{it} = \gamma_0 + \gamma_1 EAD_{it} + \gamma_2 \pi_{it} + \gamma_3 u_{it} + \gamma_4 XP_{it} + \gamma_5 EPL_{it} + \beta_6 VTO_{it} + \epsilon_{2it} \quad (2)$$

where, EAD_{it} is the average EA density for country i in decade t, UD_{it} is the average TU density for country i in decade t, π_{it} is the average annual inflation rate for country i in decade t, u_{it} is the average unemployment rate for country i in decade t, XP_{it} is the average share of exports to GDP for country i in decade t, NR_{it} is an index of the extent of average regulation in 6 network sectors in country i in decade t, EXT_{it} is the type of extension arrangement followed in country i in decade t, TC_{it} is the indicator for the existence and breadth of a tripartite council in country i in decade t, EPL_{it} is the index of employment protection legislation in country i in decade t and VTO_{it} is the average voter turnout in national elections in country i in decade t. The terms ϵ_{1it} and ϵ_{2it} are the disturbances of equations (1) and (2), respectively. Table 3 summarizes the estimates. The coefficients reported aree standardized beta coefficients.

As the dependent variables, EA density and TU density, are averages for each of the 4 decades (1980s, 1990s, 2000s and 2010s) for the 13 countries we are looking at, we have a total of 52 observations. Detailed definitions and descriptives of the variables used are reported in Section 1 in the Appendix. The equations contain country dummies thus, the coefficient estimates essentially measure the sensitivity of each left-hand side variable to time variations in the right-hand side variables.

The EAD equation (eq. 1) looks at the determinants of EA density. The results reported in column (1) of Table 3 show a positive association between EA and TU density, confirming a result found by Traxler (2004). Conditional on all other variables included in the regression, a one standard deviation increase in TU density i.e. an increase by 22 percentage points is associated with an increase of around half a standard deviation in EA density i.e. an increase of around 9 percentage points. The rate of inflation is significant and suggests that EA density is countercyclical. A possible explanation is that when activity and inflation are picking up, firms are more generous with wage increases and do not have a lot to gain from joining forces with other employers. Conditional on the rate of inflation, the unemployment rate is not significant. Exports as a share of GDP is positive and significant suggesting that an increase in export activity leads firms to want to belong to an EA possibly to take advantage of a network of firms. The intensity with which network sectors are regulated, taken here as an indication of the need of businesses to talk to the state, is associated with higher EA density. The extension of agreements shows, as do the results in Traxler (2004) and Brandl & Lehr (2019), a positive

association with EA density suggesting that firms want to take part in shaping outcomes and not free-ride. The breadth of of the tri-partite council, on the other hand, does not seem to be associated with EA density and this is true even if the network regulation variable is not included.[8]

The UD equation (eq. 2) looks at the determinants of TU density. The results reported in column (2) of Table 3 confirm the positive association between EA and TU density. Conditional on all other variables included in the regression, a one standard deviation increase in EA density i.e. an increase by 11 percentage points is associated with an increase of around a quarter of a standard deviation in TU density i.e. an increase of around 5.6 percentage points. The rate of inflation is significant and suggests that TU density is cyclical. A possible explanation is that when inflation increases employees become more militant as they wish to retain purchasing power. Conditional on the rate of inflation, the unemployment rate is not significant. Exports as a share of GDP is negative and significant suggesting that an increase in export activity is associated wuth lower trade union density perhaps because employees are exposed to international competition. The EPL index, contrary to expectations is not significant and neither is the percentage of voter turnout in national parliamentarian elections.

5 Firm-level evidence on the interrelationssship between EA membership and TU density

The results from the aggregate analysis suggest that there might be some interdependence between membership in EAs and TUs. Given cross-country differences in both institutional variables and in the industrial relations' histories we focus here on within country differences in membership in the two types of organizations and look at each country separately. The establishment-level data from the management questionnaire of the Eurofound/CEDEFOP European Company Survey (ECS) are used to this effect. The years for which the ECS is suitable to study the issue at hand are 2013 and 2019.

The firms we look at are for the same countries as those used in the aggregate analysis except for Norway for which no data is available in the ECS. The ECS contains information on workplace policies and practices across Europe in a harmonised way. The surveys are questionnaire-based representative sample surveys of establishments with more than 10 employees from most sectors of economic activity. Sample selection has been based on three variables: sector of economic activity, establishment age and establishment size. The survey used two sets of questionnaires: the first is addressed to the management of the company - typically answered by the manager responsible for human resources - and the second is addressed to the official employee representative who represents the staff of the establishment in discussions with management.

Here we only use the replies to the management questionnaires from both the 2013 and the 2019 rounds. The reason is that the sample of firms for which both questionnaires have been filled in is very small. The management questionnaire contains information on whether a firm belongs to an EA which participates in collective bargaining and on whether an official employee representative is present in the establishment. These two binary variables are the ones we focus on. As a check on the data we compare the data on the number of employees employed by

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[8]Turning this into a binary variable we still do not find a statistically significant coefficient estimate.

firms which are members in an EA in the sample over the total number of employees of firms in the sample with the data used from the OECD/AIAS ICTWSS database. The rankings of the countries are very close.

The management questionnaire also contains information on the type of collective agreement signed (no collective agreement, firm-level agreement or collective agreement decided outside the remit of the firm) and on a number of productive and demographic features of the firm such as the sector of economic activity, the type of ownership (single establishment, headquarters, subsidiary site), the age of the establishment (grouped in three intervals: younger than 10 years old, between 10 and 49 years old and over 50 years old), the size of the establishment in terms of employment. The survey collects information on workforce composition in terms of part-time employees, fixed-term employees, and information on how the work is organized (the existence or otherwise of teams and the number of teams in the workplace). Data on whether a flexible element of pay exists e.g., piece rate pay, pay linked to performance, pay linked to profits. Managers' assessment of the work climate in the firm is also included as well as information about elements of an internal labour market and whether the firm is currently facing difficulties in retaining employees. Detailed definitions of the ECS variables used in the analysis together with descriptives for these can be found in Section 2 in the Appendix.

We proceed as follows; we first run independent equation probits for membership of the firm in an Employers' Association (EA) and the presence of an official employee representative (ER).

The two equations can be summarized as follows:

$$EA^* = x_1\beta_1 + \epsilon_1, \quad EA = 1 \quad \text{if} \quad EA^* > 0, 0 \text{ otherwise} \tag{3}$$

$$ER^* = x_2\beta_2 + \epsilon_2, \quad ER = 1 \quad \text{if} \quad ER^* > 0, 0 \text{ otherwise} \tag{4}$$

where x_is are vectors of the variables used and the β_is are the vectors of the related coefficients.

The marginal effects from independent probits for EA and ER are presented in Table 4. All regressions include sectoral dummies. The EA regression also includes a variable reflecting managers' assessment of the climate within the firm. This variable is never statistically significant with the exception of the UK for which it takes a positive coefficient suggesting that firms in which the climate is bad are more likely to belong to an EA. Instead of using the sectoral dummies we tried an indicator of the impact on the sector the firm belongs to of the regulation in network industries in the spirit of the aggregate analysis. This variable is, however, never statistically significant and thus we do not use it in the results reported here. The ER regressions also include variables for workforce composition (share of part-time employees), for the existence or otherwise of an internal labour market, for whether the firm has a difficulty in retaining employees and for the existence of a variable element of pay linked to profits.

If the $\text{Cov}[\epsilon_1, \epsilon_2 | x_1, x_2] = \rho = 0$ then the two equations (equations 3 and 4) can be run independently. If, however, $\text{Cov}[\epsilon_1, \epsilon_2 | x_1, x_2] = \rho \neq 0$ then this is taken into account and a bivariate probit model is estimated (Greene, 2003).

Estimates from the bivariate probit are also shown in Table 4. The last row in each country's results reports the estimate of ρ. The associated p-values suggest that there is a correlation of the residuals of the probit equations for EA and ER in all countries except for Portugal.

In the estimates presented in Table 4 the ER variable does not enter the EA regression and *vice versa*. To investigate this interdependence between EA and ER we run[9] a recursive bivariate probit model (RBPM) introducing the ER variable in the EA regression (Coban, 2021). This permits us first, to find out whether there is an association, in addition to the correlation in the residuals of the two single probits, between the two variables and secondly to decompose the total average marginal effects of covariates on EA into a direct part i.e. one that comes directly from membership in the EA and an indirect part that comes from the presence of an ER.

More specifically we estimate the following recursive bivariate probit model:

$$\text{Prob}[\text{EA} = 1, \text{ER} = 1 | x_1, x_2] = \Phi(x_1'\beta_1 + \gamma ER, x_2'\beta_2, \rho) \tag{5}$$

The average effect of ER on EA for each country is reported in Table 5 while the marginal effects from the other variables included in the model on the probability that the firm is both an EA member and has an ER present are shown in Table 6.

The results in Table 5 suggest that for most countries there isn't a significant association between ER and EA. For 4 countries, however, namely Germany, Italy, the UK and Sweden there is a significant association. For the former three countries the association of ER with EA is large and positive. In the case of Sweden, however, the association is negative.

The RBPM marginal effects (Table 6) suggest that larger firms are associated with a higher probability of EA membership and ER presence. The arguments for higher EA membership amongst larger firms rest on the view that these firms are more likely to have an impact on negotiating outcomes for the sector through their participation in an EA (Barnett, 2013). The argument that this influence would materialise absent EA membership goes against the fact that such an outcome depends on lobbying which can easily take place through an EA. Larger firms might also be interested, and able to, prevent competition in the sector and could be using the sectoral collective agreement to generate a barrier. In addition, larger firms are also more likely to be engaged in exporting activities and in need of network support. The higher probability for the presence of an employee representative in a larger firm is compatible with the restrictions on unionisation in smaller firms, the higher rents to be shared with larger firms and the possibility of union officials have in accessing a wider pool of individuals.

For Germany, Italy and the UK, the countries for which we find a positive association between ER and EA, the impact from firm size on EA membership is *indirect* that is through the impact of size on ER presence.

Conditional on establishment size, establishments which are subsidiary sites are always more likely than single establishment firms to belong to an EA and to have an ER present. Establishments which are the headquarters of firms are also in most instances more likely to belong to an EA and to have an ER, compared to single- establishment firms, although the association is weaker compared to what is the case with subsidiary sites. In most instances, establishments which have been in operation for longer are more likely to be members of an EA and have an ER present compared to younger establishments. The association appears to be mainly direct rather than indirect.

Firms which have been in operation for over 50 years are associated with a higher probability of membership in an EA and having an ER present. A possible explanation for this result is

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[9]In Stata 2017.

that firms which have been in a sector for longer have had more opportunities to join an EA and to have an ER and leaving the EA and dismissing ER presence are rare events (Schnabel *et al.*, 2006).

Establishments that enforce no collective agreement are associated with lower EA membership and ER presence compared to other establishments which enforce some kind of collective agreement. The impact appears mostly direct. The enforcement of a firm-level agreement does not appear to alter the probability of belonging to an EA and to have an ER present compared to firms which follow a collective agreement signed at higher level. In the countries in which the variable is significant it is, in general, positive. One result which stands out, however, is that for Germany where a firm-level agreement is associated with a lower probability of belonging to an EA and having an ER present; a point which appears to fit in with the very low percentage of EA members amongst firms covered by a firm-level agreement reported in Jirjahn (2020).

As for workplace organization variables we report here the marginal effect from the existence or otherwise of teams operating in the firm which only in a few countries have a positive, albeit limited, effect on EA membership and ER presence.

There is systematically a significant negative coefficient on the 2019 dummy suggesting that even conditional on all variables included in the regressions the decline in the percentage of firms who are EA members and have an ER present from 36.2% to 27.1%, as reported in Table 5 in the Appendix, continues to hold. The impact appears to be indirect in most instances i.e. working through the ER variable.

6   Summary and conlusions

The systematic analysis of data on membership in employers' associations and trade unions reveals a number of facts: some known others more novel. There has been a perception of precipitously declining trade union membership and a stable employers' association membership. This might be a bit broad brush description of what has actually taken place. Taking a medium-term perspective, the last four decades, trade union density has declined precipitously (by over 10 percentage points) in four of the 13 countries we looked at. A decrease of over 10 percentage points in employers' association membership took place in two of the 13 countries we looked at. In these two countries TU membership also declined by over 10 percentage points. On the other hand, one of the four countries in which TU membership declined significantly, Sweden, saw its EA membership increase by ten percentage points.

The results of the aggregate-level analysis appear consistent with the macroeconomic moderation and increased exporting activity scene in advanced countries in the last four decades. This appears to have worked against expansion of trade union density and in favour of stability of membership in employers' associations. Once we take into account macroeconomic variables and certain labour market institutions we find that membership in two types of organizations appear associated.

Abstaining from cross-country comparisons and focusing only on within country variations using firm-level data we find that in only a few countries is there an association between membership of a firm in an employers' association and presence of an employee representative within the firm. The firm-level analysis confirms a number of stylized facts found in other analyses; larger and longer-established firms are more likely to belong to an EA and firms enforcing a collective agreement signed outside the remit of the firm are also more likely to be members of

an EA and have union presence.

The analysis is fraught with difficulties as consistent over time data are not readily available. Moreover, the evolving nature of the two types of organizations, which is not easily documented, makes it more difficult to ascertain the type of co-habitation between the two.

The next step in the research would be to investigate the reasons behind the positive association of the two organizations in some countries and not in others.

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Table 1: Average employers' association density per decade, 1960-2019

Country	1960-69	1970-79	1980-89	1990-99	2000-09	2010 -19
Belgium	82.31 (1)	82.11 (2)	81.75 (2)	82.34 (4)	83.22 (3)	83.83 (3)
Denmark	54.70 (11)	56.56 (12)	66.45 (11)	68.34 (10)	70.72 (9)	69.66 (10)
Finland	62.75 (9)	67.75 (9)	72.75 (9)	73.96 (9)	72.30 (8)	71.19 (9)
France	78.21 (4)	80.01 (4)	81.73 (3)	82.57 (3)	81.35 (4)	79.26 (5)
Germany	77.47 (5)	80.41 (3)	80.80 (4)	74.00 (8)	69.36 (10)	68.32 (11)
Ireland	49.56 (12)	49.16 (13)	48.83 (13)	51.43 (13)	62.90 (11)	69.97 (8)
Italy	63.24 (8)	68.44 (7)	73.64 (8)	79.58 (5)	80.70 (5)	79.25 (6)
Netherlands	79.46 (3)	83.04 (1)	87.25 (1)	87.00 (1)	85.00 (2)	85.00 (2)
Norway	79.64 (2)	78.84 (5)	78.04 (5)	76.45 (6)	76.62 (6)	80.87 (4)
Portugal	62.68 (10)	58.18 (11)	53.67 (12)	52.06 (12)	51.61 (13)	51.30 (13)
Spain	43.63 (13)	60.01 (10)	74.82 (7)	75.78 (7)	75.02 (7)	76.30 (7)
Sweden	64.02 (7)	69.23 (6)	77.54 (6)	85.22 (2)	85.10 (1)	87.50 (1)
UK	64.50 (6)	67.77 (8)	66.83 (10)	62.25 (11)	56.90 (12)	54.22 (12)
Coef.Var.	18.70%	15.94%	15.41%	15.93%	14.66%	15.13%

Source: OECD/AIAS ICTWSS database, accessed 18 June 2022.

Table 2: Average trade union density per decade, 1960-2019

Country	1960-69	1970-79	1980-89	1990-99	2000-09	2010 -19
Belgium	40.54 (5)	49.30 (7)	50.89 (6)	53.98 (5)	55.13 (4)	52.12 (4)
Denmark	59.61 (2)	67.50 (2)	76.70 (2)	75.80 (3)	71.40 (3)	67.99 (1)
Finland	38.02 (8)	62.75 (4)	69.87 (3)	77.78 (2)	73.26 (2)	66.04 (2)
France	20.28 (11)	21.72 (13)	14.64 (12)	9.79 (13)	8.95 (13)	8.98 (13)
Germany	33.13 (9)	33.83 (11)	34.23 (10)	29.85 (9)	21.67 (9)	17.55 (10)
Ireland	48.29 (4)	55.09 (5)	54.23 (5)	46.62 (6)	32.98 (7)	29.73 (7)
Italy	29.99 (10)	45.22 (9)	43.84 (9)	37.52 (7)	34.03 (6)	34.32 (6)
Netherlands	40.13 (7)	37.45 (10)	28.84 (11)	24.73 (11)	21.12 (10)	17.76 (9)
Norway	58.91 (3)	53.95 (6)	57.44 (4)	56.79 (4)	51.49 (5)	50.03 (5)
Portugal	N/A	64.73 (3)	44.2 (8)	27.03 (10)	20.90 (11)	17.40 (11)
Spain	N/A	31.27 (12)	12.82 (13)	18.05 (12)	16.72 (12)	15.39 (12)
Sweden	65.51 (1)	72.49 (1)	81.39 (1)	84.11 (1)	73.36 (1)	61.64 (3)
UK	40.39 (6)	46.78 (8)	47.24 (7)	35.06 (8)	27.89 (8)	24.67 (8)
Coef.Var.	31.87%	31.10%	45.11%	53.84%	58.77%	59.38%

NB: N/A: data are not available.

Source: OECD/AIAS ICTWSS database, accessed 18 June 2022.

Table 3: SURE estimates of EA & TU density

	EA density	TU density
	(1)	(2)
TU density	.452** (.198)	—
EA density	—	.253** (.104)
Inflation rate (%)	-.263* (.073)	.198* (.061)
Unemployment rate (%)	-.019 (.065)	.072 (.051)
Exports as a % of GDP	.706** (.110)	-.318*** (.073)
Network regulation	.313 (0.071)***	—
Extension of agreements	.585 (.263)*	—
Tripartite council	.0021 (.093)	—
EPL index	—	-.176 (.118)
Voter turnout (%)	—	.052 (.091)
Adj. R-squared	.942	.972
Observations	52	52

Standard errors in parentheses; ***$p < 0.001$, ** $p < 0.01$, *$p < 0.05$, $\sim p < 0.10$

Table 4: Marginal effects from independent probits and bivariate probits for EA & ER

		Belgium			Denmark			Finland		
		EA-Single Probit	ER-Single Probit	EA-Biprobit (EA=ER=1)	EA-Single Probit	ER-Single Probit	EA-Biprobit (EA=ER=1)	EA-Single Probit	ER-Single Probit	EA-Biprobit (EA=ER=1)
Ln Empl		0.106***	0.235***	0.185***	0.0430***	0.110***	0.107***	0.0883***	0.131***	0.162***
		(0.0129)	(0.0158)	(0.0124)	(0.0116)	(0.0109)	(0.0123)	(0.0108)	(0.00941)	(0.0122)
Est. type	HQs	0.103***	0.134***	0.131***	-0.0239	0.0525*	0.0129	0.0826***	0.107***	0.134***
		(0.0332)	(0.0347)	(0.0309)	(0.0316)	(0.0279)	(0.0307)	(0.0262)	(0.0225)	(0.0271)
	Subsd.	0.101**	0.121**	0.118**	0.170***	0.174***	0.253***	0.196***	0.214***	0.305***
		(0.0496)	(0.0527)	(0.0468)	(0.0277)	(0.0217)	(0.0291)	(0.0241)	(0.0183)	(0.0257)
Est. age	10-49	0.120**	0.0895	0.103***	0.0825*	-0.00970	0.0506	0.0150	0.0230	0.0305
		(0.0508)	(0.0582)	(0.0376)	(0.0434)	(0.0348)	(0.0413)	(0.0320)	(0.0257)	(0.0328)
	≥ 50	0.192***	0.137**	0.172***	0.131***	0.0337	0.121***	0.173***	0.121***	0.240***
		(0.0540)	(0.0615)	(0.0414)	(0.0460)	(0.0371)	(0.0444)	(0.0345)	(0.0258)	(0.0359)
Type of agr.	Firm agr.	0.0547*	0.198***	0.130***	-0.0281	0.0285	-0.00291	-0.0119	0.00953	-0.00882
		(0.0303)	(0.0313)	(0.0287)	(0.0231)	(0.0216)	(0.0266)	(0.0245)	(0.0164)	(0.0257)
	No agr.	-0.215***	5.26e-05	-0.124***	-0.482***	-0.220***	-0.465***	-0.360***	-0.110**	-0.355***
		(0.0305)	(0.0338)	(0.0232)	(0.0290)	(0.0306)	(0.0279)	(0.0523)	(0.0431)	(0.0476)
Team work		0.0675**	0.0554*	0.0729***	0.00676	0.0240	0.0217	0.0160	-0.0183	0.00375
		(0.0295)	(0.0309)	(0.0250)	(0.0296)	(0.0242)	(0.0295)	(0.0261)	(0.0179)	(0.0272)
2019 wave		-0.000155	-0.143***	-0.0825***	0.0139	-0.261***	-0.153***	0.00145	-0.151***	-0.0964***
		(0.0274)	(0.0286)	(0.0233)	(0.0250)	(0.0207)	(0.0252)	(0.0218)	(0.0166)	(0.0234)
Pseudo-R^2		0.132	0.267		0.281	0.323		0.156	0.383	
ρ				0.119 ($p =0.007$)			0.204 ($p <0.001$)			0.261 ($p <0.001$)

Table 4: Marginal effects from independent probits and bivariate probits for EA & ER (continued from previous page)

		France			Germany			Ireland		
		EA-Single Probit	ER-Single Probit	EA-Biprobit (EA=ER=1)	EA-Single Probit	ER-Single Probit	EA-Biprobit (EA=ER=1)	EA-Single Probit	ER-Single Probit	EA-Biprobit (EA=ER=1)
Ln Empl		0.0488***	0.203***	0.114***	0.0713***	0.222***	0.0904***	0.0405***	0.126***	0.0471***
		(0.00926)	(0.0103)	(0.00946)	(0.00878)	(0.0127)	(0.00679)	(0.0136)	(0.0192)	(0.00911)
Est. type	HQs	0.109***	0.104***	0.114***	0.0374	0.0690*	0.0352*	0.0701	0.0726	0.0429
		(0.0294)	(0.0282)	(0.0274)	(0.0325)	(0.0387)	(0.0198)	(0.0431)	(0.0547)	(0.0268)
	Subsd.	0.185***	0.233***	0.244***	0.115**	0.212***	0.124***	0.0610	0.178***	0.0796**
		(0.0274)	(0.0187)	(0.0265)	(0.0537)	(0.0654)	(0.0406)	(0.0425)	(0.0559)	(0.0312)
Est. age	10-49	0.145***	0.0479	0.121***	0.0486	-0.0177	0.0161	0.121***	0.0840	0.0633***
		(0.0327)	(0.0336)	(0.0285)	(0.0354)	(0.0594)	(0.0206)	(0.0321)	(0.0595)	(0.0196)
	≥ 50	0.237***	0.109***	0.222***	0.190***	0.0415	0.0913***	0.227***	0.200***	0.147***
		(0.0377)	(0.0373)	(0.0340)	(0.0388)	(0.0617)	(0.0234)	(0.0501)	(0.0749)	(0.0349)
Type of agr.	Firm agr.	0.110***	0.107***	0.126***	-0.257***	-0.0996***	-0.153***	0.0836*	0.0593	0.0683*
		(0.0246)	(0.0222)	(0.0227)	(0.0295)	(0.0361)	(0.0237)	(0.0503)	(0.0615)	(0.0371)
	No agr.	-0.199***	-0.0284	-0.151***	-0.507***	-0.271***	-0.297***	-0.107***	-0.201***	-0.0902***
		(0.0282)	(0.0303)	(0.0244)	(0.0221)	(0.0307)	(0.0202)	(0.0397)	(0.0527)	(0.0271)
Team work		-0.00101	0.0424**	0.0131	0.0271	-0.0428	-0.0130	0.0516	0.137**	0.0667***
		(0.0245)	(0.0215)	(0.0225)	(0.0265)	(0.0334)	(0.0157)	(0.0408)	(0.0537)	(0.0257)
2019 wave		0.00609	-0.0652***	-0.0137	0.0588**	-0.149***	-0.0189	-0.152***	-0.156***	-0.0992***
		(0.0228)	(0.0214)	(0.0210)	(0.0252)	(0.0275)	(0.0136)	(0.0311)	(0.0445)	(0.0197)
Pseudo-R^2		0.116	0.351		0.336	0.408		0.204	0.248	
ρ				0.199 ($p < 0.001$)			0.371 (p¡0.001)			0.411 ($p < 0.001$)

Table 4: Marginal effects from independent probits and bivariate probits for EA & ER (continued from previous page)

		Italy			Netherlands			Portugal		
		EA-Single Probit	ER-Single Probit	EA-Biprobit (EA=ER=1)	EA-Single Probit	ER-Single Probit	EA-Biprobit (EA=ER=1)	EA-Single Probit	ER-Single Probit	EA-Biprobit (EA=ER=1)
Ln Empl		0.107*** (0.00920)	0.190*** (0.0106)	0.127*** (0.00679)	0.0474*** (0.0118)	0.224*** (0.0136)	0.164*** (0.0117)	0.0649*** (0.0110)	0.0522*** (0.00614)	0.0206 (0.405)
Est. type	HQs	0.0839*** (0.0264)	0.147*** (0.0292)	0.104*** (0.0194)	0.126*** (0.0315)	0.166*** (0.0317)	0.169*** (0.0295)	0.0893*** (0.0325)	0.0476** (0.0189)	0.0224 (0.431)
	Subsd.	0.271*** (0.0400)	0.258*** (0.0450)	0.263*** (0.0381)	0.107*** (0.0388)	0.290*** (0.0332)	0.234*** (0.0375)	0.104* (0.0539)	0.126*** (0.0414)	0.0541 (0.867)
Est. age	10-49	0.0574** (0.0287)	0.00509 (0.0317)	0.0252 (0.0173)	0.00946 (0.0437)	0.0155 (0.0453)	0.0101 (0.0370)	0.0878*** (0.0294)	-0.00497 (0.0164)	0.00496 (0.131)
	≥ 50	0.139*** (0.0363)	0.0837** (0.0409)	0.0936*** (0.0247)	0.119** (0.0471)	0.140*** (0.0494)	0.151*** (0.0420)	0.225*** (0.0461)	0.0925*** (0.0318)	0.0565 (0.996)
Type of agr.	Firm agr.	0.0884*** (0.0265)	0.231*** (0.0293)	0.140*** (0.0209)	-0.169*** (0.0278)	0.185*** (0.0316)	0.0188 (0.0308)	-0.0421 (0.0311)	0.0199 (0.0183)	0.00348 (0.0260)
	No agr.	-0.133*** (0.0472)	-0.112** (0.0477)	-0.0909*** (0.0198)	-0.643*** (0.0239)	-0.0848** (0.0363)	-0.404*** (0.0228)	-0.300*** (0.0229)	-0.0490*** (0.0128)	-0.0326 (0.720)
Team work		0.0239 (0.0218)	0.0186 (0.0242)	0.0195 (0.0144)	-0.0592* (0.0323)	0.0192 (0.0326)	-0.0279 (0.0290)	0.0315 (0.0298)	0.0173 (0.0176)	0.00703 (0.139)
2019 wave		-0.178*** (0.0196)	-0.162*** (0.0227)	-0.140*** (0.0137)	-0.103*** (0.0283)	-0.269*** (0.0287)	-0.229*** (0.0253)	-0.0124 (0.0234)	-0.0599*** (0.0130)	-0.0190 (0.347)
Pseudo-R^2		0.139	0.305		0.139	0.305		0.161	0.291	
ρ				0.177 ($p <0.001$)			0.131 ($p =0.01$)			0.061 ($p =0.30$)

Table 4: Marginal effects from independent probits and bivariate probits for EA & ER (continued from previous page)

	Spain			Sweden			UK		
	EA-Single Probit	ER-Single Probit	EA-Biprobit (EA=ER=1)	EA-Single Probit	ER-Single Probit	EA-Biprobit (EA=ER=1)	EA-Single Probit	ER-Single Probit	EA-Biprobit (EA=ER=1)
Ln Empl	0.0545*** (0.00851)	0.153*** (0.0106)	0.0857*** (0.00736)	0.0354*** (0.00673)	0.150*** (0.0133)	0.154*** (0.0130)	0.0301*** (0.00499)	0.114*** (0.00950)	0.0292*** (0.00363)
Est. type	0.00905 (0.0222) 0.0951*** (0.0352)	0.0594** (0.0245) 0.168*** (0.0339)	0.0221 (0.0184) 0.121*** (0.0319)	0.0436** (0.0184) 0.103*** (0.0147)	0.102*** (0.0319) 0.261*** (0.0293)	0.108*** (0.0309) 0.288*** (0.0290)	0.0493*** (0.0160) 0.0927*** (0.0201)	0.0825*** (0.0252) 0.258*** (0.0309)	0.0293*** (0.00922) 0.0848*** (0.0151)
Est. age	0.0818*** (0.0258) 0.182*** (0.0374)	0.121*** (0.0317) 0.271*** (0.0401)	0.0911*** (0.0189) 0.206*** (0.0319)	0.0465 (0.0320) 0.0883*** (0.0324)	0.0826* (0.0490) 0.233*** (0.0504)	0.0877* (0.0464) 0.246*** (0.0480)	-0.000557 (0.0191) 0.0319 (0.0228)	0.0232 (0.0316) 0.0502 (0.0366)	0.000635 (0.0107) 0.0178 (0.0131)
Type of agr.	0.0232 (0.0218) -0.181*** (0.0369)	0.161*** (0.0219) -0.166*** (0.0516)	0.0616*** (0.0190) -0.141*** (0.0250)	-0.0224** (0.0108) -0.701*** (0.0393)	0.102*** (0.0241) -0.578*** (0.0324)	0.0831*** (0.0241) -0.607*** (0.0229)	-0.00781 (0.0290) -0.140*** (0.0259)	0.0358 (0.0378) -0.151*** (0.0347)	0.00677 (0.0181) -0.0760*** (0.0163)
Team work	0.0911*** (0.0254)	0.0211 (0.0266)	0.0635*** (0.0206)	0.00860 (0.0173)	0.0298 (0.0350)	0.0313 (0.0340)	0.0248 (0.0165)	0.105*** (0.0290)	0.0230** (0.00970)
2019 wave	-0.0708*** (0.0204)	-0.155*** (0.0236)	-0.0953*** (0.0169)	0.00990 (0.0148)	-0.170*** (0.0285)	-0.152*** (0.0280)	-0.0159 (0.0129)	-0.0132 (0.0234)	-0.0104 (0.00748)
Pseudo-R^2	0.079	0.213		0.43	0.316		0.223	0.267	
ρ			0.234 ($p <0.001$)			0.399 ($p <0.001$)			0.537 ($p <0.001$)

Table 5: Average treatment effect of ER on EA by country (point estimates and 95%CI)

	Average treatment effect	95%CI	
		Lower limit	Upper limit
Belgium	0.056	-0.256	0.368
Denmark	0.078	-0.134	0.290
Finland	0.009	-0.161	0.179
France	0.064	-0.111	0.238
Germany	0.369	0.205	0.533
Ireland	0.296	-0.139	0.732
Italy	0.455	0.297	0.612
Netherlands	0.048	-0.122	0.217
Portugal	-0.126	-0.343	0.091
Spain	-0.024	-0.326	0.277
Sweden	-0.186	-0.242	-0.131
UK	0.580	0.455	0.705

Table 6: Marginal effects from the RBPM

		Belgium			Denmark			Finland		
		Total	Direct	Indirect	Total	Direct	Indirect	Total	Direct	Indirect
Ln Empl		0.133***	0.0574***	0.0752***	0.0747***	0.0194**	0.0553***	0.138***	0.0528***	0.0850***
		(0.00747)	(0.0168)	(0.0169)	(0.00796)	(0.00807)	(0.00790)	(0.00858)	(0.0105)	(0.0108)
Est. type	HQ	0.0983***	0.0462**	0.0461***	0.00972	-0.0153	0.0259*	0.108***	0.0533***	0.0598***
		(0.0238)	(0.0190)	(0.0161)	(0.0214)	(0.0172)	(0.0143)	(0.0220)	(0.0188)	(0.0139)
	Subsidiary	0.0884**	0.0437*	0.0402**	0.187***	0.0793***	0.0955***	0.300***	0.120***	0.155***
		(0.0356)	(0.0256)	(0.0193)	(0.0227)	(0.0186)	(0.0166)	(0.0231)	(0.0238)	(0.0244)
Est. Age	10-49 years	0.0785***	0.0575**	0.0298	0.0314	0.0374	-0.00591	0.0242	0.0115	0.0142
		(0.0296)	(0.0279)	(0.0202)	(0.0281)	(0.0230)	(0.0174)	(0.0248)	(0.0207)	(0.0144)
	>50 years	0.130***	0.0929***	0.0441*	0.0802***	0.0636***	0.0159	0.212***	0.110***	0.0856***
		(0.0324)	(0.0301)	(0.0226)	(0.0305)	(0.0246)	(0.0187)	(0.0301)	(0.0237)	(0.0192)
Type of agr.	Firm-level agreement	0.0977***	0.0213	0.0649***	0.000915	-0.0186	0.0173	-0.00422	-0.0108	0.00653
		(0.0230)	(0.0203)	(0.0203)	(0.0234)	(0.0146)	(0.0133)	(0.0208)	(0.0156)	(0.0111)
	No agreement	-0.105***	-0.110***	-0.00190	-0.379***	-0.288***	-0.115***	-0.261***	-0.231***	-0.0615***
		(0.0191)	(0.0170)	(0.0115)	(0.0249)	(0.0273)	(0.0198)	(0.0361)	(0.0375)	(0.0221)
Team work		0.0536***	0.0351**	0.0185*	0.0137	-0.000373	0.0141	-0.00182	0.0129	-0.0147
		(0.0184)	(0.0150)	(0.0108)	(0.0198)	(0.0157)	(0.0122)	(0.0209)	(0.0160)	(0.0116)
2019 wave		-0.0598***	-0.0121	-0.0473***	-0.114***	0.0213	-0.136***	-0.0961***	0.00325	-0.0995***
		(0.0179)	(0.0176)	(0.0152)	(0.0179)	(0.0218)	(0.0200)	(0.0183)	(0.0184)	(0.0156)
# Obs.		1,735.00			1,830.00			1,886.00		

Table 6: Marginal effects from the RBPM (continued from previous page)

		France			Germany			Ireland		
		Total	Direct	Indirect	Total	Direct	Indirect	Total	Direct	Indirect
Ln Empl		0.0870***	0.0237**	0.0633***	0.0715***	-0.00133	0.0729***	0.0454***	0.00577	0.0397***
		(0.00644)	(0.0104)	(0.00917)	(0.00425)	(0.00696)	(0.00631)	(0.00849)	(0.0125)	(0.0121)
Est. type	HQ	0.0907***	0.0564***	0.0350***	0.0230	0.00214	0.0209	0.0430	0.0189	0.0241
		(0.0228)	(0.0203)	(0.0101)	(0.0158)	(0.0115)	(0.0128)	(0.0266)	(0.0215)	(0.0192)
	Subsidiary	0.209***	0.109***	0.0823***	0.102***	0.0244	0.0703***	0.0740**	0.0101	0.0630**
		(0.0232)	(0.0221)	(0.0158)	(0.0286)	(0.0162)	(0.0232)	(0.0293)	(0.0255)	(0.0259)
Est.Age	10-49 years	0.0975***	0.0892***	0.0135	0.0123	0.0209	-0.00943	0.0772***	0.0662**	0.0222
		(0.0239)	(0.0238)	(0.00986)	(0.0227)	(0.0188)	(0.0198)	(0.0262)	(0.0282)	(0.0217)
	>50 years	0.178***	0.146***	0.0332***	0.0748***	0.0639***	0.00935	0.159***	0.102***	0.0592*
		(0.0283)	(0.0269)	(0.0123)	(0.0238)	(0.0192)	(0.0205)	(0.0363)	(0.0340)	(0.0302)
Type of agr.	Firm-level agreement	0.103***	0.0610***	0.0356***	-0.126***	-0.0737***	-0.0293**	0.0613*	0.0313	0.0187
		(0.0194)	(0.0177)	(0.00862)	(0.0179)	(0.0109)	(0.0116)	(0.0339)	(0.0219)	(0.0213)
	No agreement	-0.128***	-0.129***	-0.00825	-0.287***	-0.200***	-0.0886***	-0.0921***	-0.0266	-0.0702***
		(0.0211)	(0.0212)	(0.00909)	(0.0148)	(0.0121)	(0.0125)	(0.0265)	(0.0265)	(0.0252)
Team work		0.00856	-0.00548	0.0140**	-0.0148	0.000970	-0.0157	0.0674**	0.0214	0.0459**
		(0.0174)	(0.0162)	(0.00672)	(0.0134)	(0.00991)	(0.0110)	(0.0263)	(0.0234)	(0.0218)
2019 wave		-0.00983	0.0110	-0.0208***	-0.0166	0.0382***	-0.0509***	-0.100***	-0.0514**	-0.0543***
		(0.0162)	(0.0151)	(0.00719)	(0.0119)	(0.00903)	(0.0104)	(0.0206)	(0.0228)	(0.0197)
# Obs.		2,537.00			1,936.00			695.00		

Table 6: Marginal effects from the RBPM (continued from previous page)

		Italy			Netherlands			Portugal		
		Total	Direct	Indirect	Total	Direct	Indirect	Total	Direct	Indirect
Ln Empl		0.0929***	0.00925	0.0837***	0.101***	0.0156*	0.0856***	0.0377***	0.0118***	0.0259***
		(0.00466)	(0.00719)	(0.00646)	(0.00615)	(0.00865)	(0.00787)	(0.00374)	(0.00322)	(0.00449)
Est. type	HQ	0.0849***	0.0130	0.0709***	0.109***	0.0397***	0.0674***	0.0355***	0.0135***	0.0199**
		(0.0155)	(0.0107)	(0.0151)	(0.0192)	(0.0136)	(0.0143)	(0.0112)	(0.00480)	(0.00865)
	Subsidiary	0.205***	0.0591***	0.126***	0.156***	0.0326*	0.120***	0.0747***	0.0184**	0.0448***
		(0.0280)	(0.0158)	(0.0259)	(0.0248)	(0.0180)	(0.0183)	(0.0214)	(0.00820)	(0.0152)
Est.Age	10-49 years	0.0263*	0.0234**	0.00371	0.00665	0.00523	0.00172	0.0130	0.0162***	-0.00215
		(0.0147)	(0.0117)	(0.0143)	(0.0239)	(0.0176)	(0.0176)	(0.00852)	(0.00527)	(0.00839)
	>50 years	0.0846***	0.0412***	0.0419**	0.0962***	0.0436**	0.0505**	0.0866***	0.0365***	0.0375***
		(0.0202)	(0.0143)	(0.0191)	(0.0272)	(0.0193)	(0.0203)	(0.0174)	(0.00837)	(0.0132)
Type of agr.	Firm-level agreement	0.104***	-0.00325	0.108***	0.00215	-0.0829***	0.0765***	0.00179	-0.00638	0.00770
		(0.0172)	(0.0121)	(0.0179)	(0.0229)	(0.0148)	(0.0156)	(0.0103)	(0.00437)	(0.00717)
	No agreement	-0.0802***	-0.0397*	-0.0504**	-0.348***	-0.346***	-0.0351**	-0.0612***	-0.0480***	-0.0238***
		(0.0223)	(0.0217)	(0.0237)	(0.0186)	(0.0167)	(0.0147)	(0.00703)	(0.00533)	(0.00727)
Team work		0.0177	0.00779	0.00987	-0.0171	-0.0241*	0.00705	0.0112	0.00404	0.00716
		(0.0117)	(0.00827)	(0.0109)	(0.0177)	(0.0124)	(0.0126)	(0.0103)	(0.00453)	(0.00891)
2019 wave		-0.117***	-0.0408***	-0.0761***	-0.149***	-0.0379***	-0.111***	-0.0328***	-0.00384	-0.0292***
		(0.0115)	(0.00898)	(0.0118)	(0.0165)	(0.0140)	(0.0150)	(0.00764)	(0.00438)	(0.00745)
# Obs.		2,741.00			1,874.00			1,794.00		

Table 6: Marginal effects from the RBPM (continued from previous page)

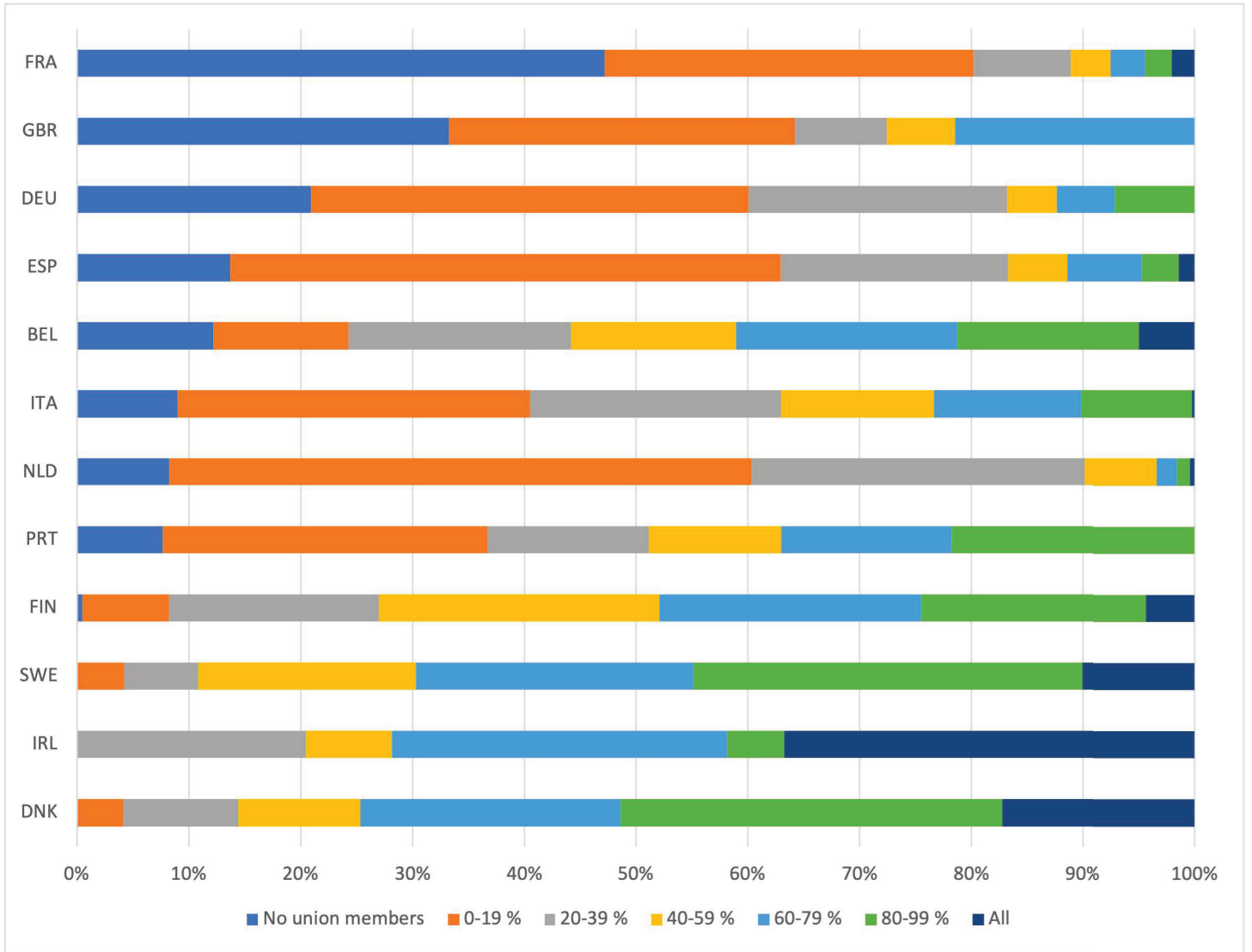|			Spain			Sweden			UK		
			Total	Direct	Indirect	Total	Direct	Indirect	Total	Direct	Indirect
Ln Empl			0.0727***	0.0368***	0.0359***	0.103***	0.0276***	0.0757***	0.0403***	-0.00763	0.0479***
			(0.00608)	(0.0123)	(0.0117)	(0.00804)	(0.00612)	(0.00870)	(0.00416)	(0.00473)	(0.00528)
Est. type	HQ		0.0185	0.00427	0.0145**	0.0724***	0.0309***	0.0500***	0.0357***	0.0122	0.0248**
			(0.0166)	(0.0155)	(0.00729)	(0.0212)	(0.0106)	(0.0166)	(0.0115)	(0.0111)	(0.00995)
	Subsidiary		0.105***	0.0576**	0.0385**	0.210***	0.0559***	0.120***	0.107***	0.00734	0.0990***
			(0.0283)	(0.0251)	(0.0166)	(0.0213)	(0.0105)	(0.0189)	(0.0168)	(0.0116)	(0.0170)
Est.Age	10-49 years		0.0819***	0.0593***	0.0310***	0.0625**	0.0309	0.0498*	0.000347	-0.00185	0.00216
			(0.0177)	(0.0203)	(0.0120)	(0.0314)	(0.0208)	(0.0291)	(0.0159)	(0.0144)	(0.0128)
	>50 years		0.182***	0.114***	0.0650***	0.179***	0.0597***	0.128***	0.0237	0.00764	0.0155
			(0.0291)	(0.0327)	(0.0249)	(0.0333)	(0.0225)	(0.0296)	(0.0181)	(0.0158)	(0.0148)
Type of agr.	Firm-level agreement		0.0521***	0.0118	0.0380**	0.0607***	-0.00378	0.0589***	0.000935	-0.00294	0.00405
			(0.0172)	(0.0191)	(0.0151)	(0.0199)	(0.00620)	(0.0140)	(0.0207)	(0.0134)	(0.0157)
	No agreement		-0.133***	-0.116***	-0.0427**	-0.511***	-0.490***	-0.400***	-0.112***	-0.0433***	-0.0679***
			(0.0254)	(0.0310)	(0.0181)	(0.0212)	(0.0218)	(0.0281)	(0.0193)	(0.0137)	(0.0159)
Team work			0.0573***	0.0524***	0.00490	0.0199	0.00862	0.0112	0.0339**	-0.00316	0.0370***
			(0.0184)	(0.0164)	(0.00642)	(0.0224)	(0.00768)	(0.0173)	(0.0143)	(0.0122)	(0.0116)
2019 wave			-0.0836***	-0.0466**	-0.0366***	-0.106***	-0.00907	-0.0951***	-0.0113	-0.00976	-0.00162
			(0.0154)	(0.0187)	(0.0132)	(0.0190)	(0.00778)	(0.0156)	(0.0110)	(0.00963)	(0.00914)
# Obs.			2,628.00			1,915.00			1,818.00		

Figure 1: Distribution of establishments according to the percentage of the workforce which is unionized, 2019

Source: European Company Survey 2019, Employee Representative Questionnaire.

Data Appendix to the paper:
Employers' associations and trade unions: co-existence or more?

August 1, 2022

1   Variables used in the aggregate analysis

Table 1: Definitions of the variables used in the aggregate analysis

Variable	Notation	Definition	Source
Participation indicators			
EA Density	EAD	Employers' Associations density defined as employees in firms organised in EAs as a proportion of all employees.	OECD/AIAS ICTWSS Database
TU Density	UD	Trade Union density defined as proportion of employees members of a trade union over all employees	
Voter turnout	VTO	Voters in parliamentary elections as a % of all eligible to vote	Institute for Democracy and Electoral Assistance
Macroeconomic variables			
Inflation rate	π	Average annual rate of consumer price inflation per decade	World Bank
Unemployment rate	u	Average harmonised across countries unemployment rate per decade	OECD Labour Force Statistics
Export intensity	XP	Share of exports in GDP	Eurostat Ameco database
Institutional variables			
Tri-partite council	TC	Existence of a tripartite council for the purpose of negotiation, consultation or information exchange over social and economic policies; 0=no permanent council, 1=council in which societal interest representatives, including unions and employers, participate, 2=tripartite council with representation from TUs, EAs, and government	OECD/AIAS ICTWSS Database
Extension arrangement	EXT	Types of extension of collective agreements to non-organised employers; 0=no extensions, 1= Limited extensions, 2=Extension subject to thresholds, 3=Automatic extension	
Employment Protection Legislation Index	EPL	Summary indicator for individual dismissals of regular workers, version 1; takes values between 0 and 6 the higher the index the stricter the dismissal procedure	OECD EPL database
Business regulation variables			
Network regulation	NR	Average regulation of 6 network sectors: electricity, natural gas, rail, air, road transport, and e-communications. The higher the value of the index, the more the regulation.	OECD Network Sectors Indicators

Table 2: Descriptives of the variables used in the aggregate analysis

Variable	Mean	Std. dev.	Min	Max
EAD	73.13	10.85	48.83	87.50
UD	41.65	22.21	8.95	84.11
π	3.63	3.25	0.55	17.32
u	8.52	3.85	2.80	21.95
XP	40.62	20.11	17.86	114.01
EXT	1.70	1.29	0.00	3.00
NR	3.11	1.57	0.54	5.67
TC	0.99	0.83	0.00	2.00
EPL	2.43	0.87	1.20	4.96
VTO	76.16	9.76	52.96	93.84

Table 3: Trade union density and extension mechanism in 2018

Country	TU density	Type of extension	Country	TU density	Type of extension
Belgium	50.0	Automatic	Germany	16.6	Extensions are exceptional
Spain	13.0	Automatic	Ireland	25.5	Extensions are exceptional
Finland	60.0	Automatic	Norway	49.9	Extensions are exceptional
France	8.8	Automatic	Netherlands	16.5	Extensions with thresholds
Italy	32.6	Automatic	Denmark	67.5	No extension
Portugal (2016)	15.3	Automatic	UJ	23.0	No extension
			Sweden	60.1	No extension

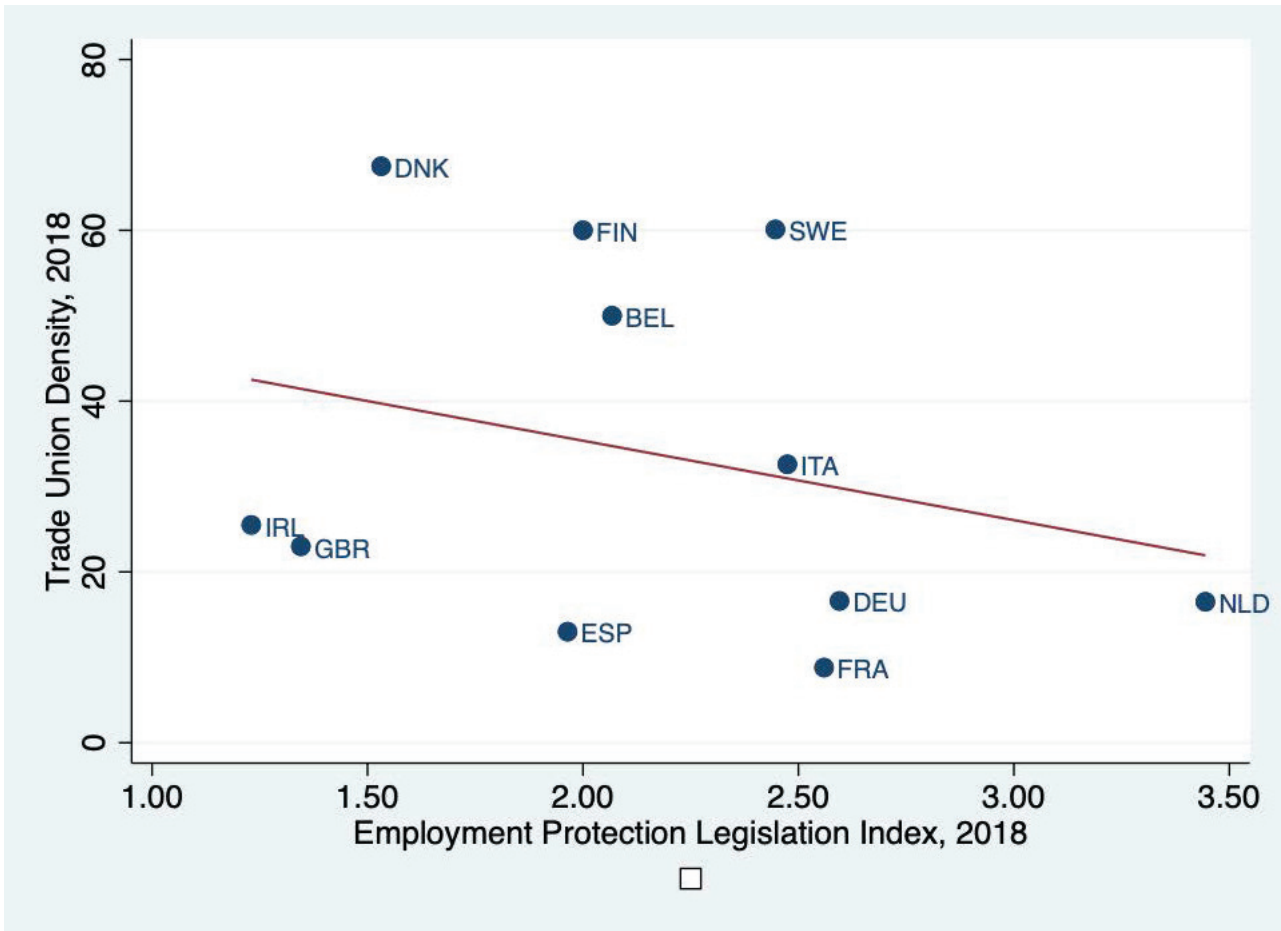*Source*: OECD/AIAS ICTWSS database, accessed 18 June 2022.

Figure 1: Trade union density and EPL, 2018

Source: OECD/AIAS ICTWSS database and OECD, Employment Protection Legislation data, accessed 18 June 2022.

2 ECS variables

Definitions

1. <u>Member of an employers' association (EA)</u> - company is a member of any employers' organisation which participates in collective bargaining.

2. <u>Official employee representative present (ER)</u> - is there any kind of employee representation currently in the establishment.

3. <u>Employment</u> Number of employees working in the establishment.

4. <u>Establishment type</u> - Establishment is either a single-establishment site or the headquarters of the firm or a subsidiary site.

5. <u>Establishment age</u> - Number of years the establishment has been in operation grouped in 3 intervals: less than 10 years, between 10 and 49 years, 50 years and over.

6. <u>Type of collective agreement:</u> An establishment follows a collective agreement at higher level - the reference group - if he firm follows a sectoral and/or occupational and/or regional and/or national agreement but no firm-level agreement is signed by the firm. An establishment does not enforce a collective agreement if it does not follow either a firm or a higher-level collective agreement.

   Table 4 the distribution of firms by type of agreement for each country.

Table 4: Distribution of firms by type of agreement

Country	Type of agreement		
	High-level	Firm-level	No aggr.
Belgium	52.68	25.84	21.48
Denmark	27.50	42.42	30.08
Finland	72.02	21.89	6.09
France	37.80	47.09	15.11
Germany	33.98	26.60	39.41
Ireland	20.59	26.47	52.94
Italy	75.42	20.57	4.01
Netherlands	45.72	27.73	26.54
Portugal	43.01	20.28	36.71
Spain	65.99	27.84	6.17
Sweden	48.24	41.96	9.80
UK	12.66	38.13	49.21
Total	47.37	30.83	21.79

Source: ECS 2013 & 2019.

7. <u>Share of part-time employees:</u> Percentage of employees working part-time in 7 grouped intervals: none, less than 20%, 20%-39%, 40% - 59%, 60% - 79%, 80-99% or all employees.

8. <u>Internal labour market:</u> When recruiting the management usually look first at whether there are any suitable internal candidates. Replies refer to the frequency with which management behaves this way and answers are grouped in 4 alternatives: always, most of the time/sometimes, rarely and never.

9. <u>Difficulty in retaining employees:</u> Managers are asked whether they are currently faced with difficulties in retaining employees. The variable is a 0, 1 binary variable.

10. <u>Variable pay linked to profits:</u> Managers are asked whether employees receive in addition to basic pay, variable extra pay linked to the results of the company or establishment. The variable is a 0, 1 binary variable.

11. <u>Work climate:</u> Managers are asked to assess the work climate on a 5-point scale (1=very good, 2=good, 3=neither good nor bad, 4=bad, 5=very bad).

<u>Team work:</u> Binary variable indicating the existence or otherwise of teams in the workplace. A team is defined as a group of individuals sharing responsibility for the execution of an allocated task.

Table 5: % of ECS firms, from both waves, with each characteristic

	EA=1	ER=1	EA=0& ER=0	EA=0& ER=1	EA=1& ER=0	EA=1& ER=1
	[1]	[2]	[3]	[4]	[5]	[6]
Ln Employment	4.3	4.5	3.3	4.2	3.4	4.6
Headquarters	26.6	28.5	15.4	24.9	17.3	30.6
Subsidiary site	19.1	20.9	6.3	14.8	8.6	23.8
10-49 years	57.5	58.1	71.0	65.1	66.2	53.7
>50 years	34.0	33.1	14.5	23.9	23.6	38.6
Firm-level agreement	38.7	41.9	18.1	34.9	22.7	45.7
No agreement	6.4	11.3	48.4	22.7	10.5	4.6
Teams	80.9	83.2	72.0	80.3	72.3	84.8
Belgium	50.4	55.3	27.8	21.0	16.2	33.6
Denmark	65.2	71.5	16.2	18.1	12.0	52.5
Finland	71.6	74.8	12.9	15.0	11.9	58.4
France	43.9	67.0	24.1	30.8	8.4	34.6
Germany	31.1	34.7	52.8	15.6	12.1	18.8
Ireland	23.4	36.1	54.6	19.3	6.9	15.7
Italy	41.7	39.4	42.1	15.2	17.3	23.7
Netherlands	59.9	56.5	22.2	17.5	20.7	38.6
Portugal	32.7	13.8	59.9	6.5	25.1	7.1
Spain	35.4	60.2	30.9	32.5	8.3	26.4
Sweden	85.7	62.0	11.9	2.3	25.9	59.5
UK	12.7	26.2	68.1	15.3	2.8	9.3
2013	48.3	57.9	30.1	20.6	11.1	36.2
2019	44.9	43.1	38.9	10.5	17.3	27.1
Observations	11,763.0	13,037.0	8,782.0	4,651.0	3,598.0	8,165.0

Source: European Company Survey (2013 and 2019).

For the employment variable the figure reported in the average of the natural logarith of employment.