How does the industrial relations system affect the realization of union goals?

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Abstract

It is generally acknowledged that the type of industrial relations system and the embeddedness of trade unions matters a lot for the functioning of the unions. Nevertheless, up to date little is known about the effect of the industrial relations system on the realization of the goals of trade unions. This paper adds to the international comparative literature on the effect of industrial relations systems by performing a statistical hierarchical cluster analyses for 21 European countries in the period 1990-2018 based on a broad set of indicators for industrial relations and subsequently analysing the effects of the cluster on eleven union goals with respect to employment, income and equality.

The cluster analysis yields five clusters that can be characterized as a *multilevel* industrial relations system (Austria, the Netherlands, and Spain), a *centralised* industrial relations system (Belgium, Denmark, Finland, Norway and Sweden), a *bipartite* industrial relations system (Germany, Switzerland, and for the first part of the period the Czech Republic, Greece, Ireland, and the Slovak Republic), a *decentralized* industrial relations system (Hungary, Poland, the United Kingdom, and for more recent years the Czech Republic, Greece, Ireland, and the Slovak Republic), and a *polarized* industrial relations system (France, Italy, Portugal, and Slovenia), respectively.

A series of multilevel analyses, in which we also include a number of control variables, shows that not one of the five clusters scores unambiguously the best on all union goals. The multilevel industrial relations system scores the best on employment growth and the replacement rate of pensions, the centralised system is the best performing cluster with respect to the four equality indicators (low pay incidence, gender wage gap, 9/1 decile ratio of earnings and Gini coefficient of market incomes), the bipartite system performs best with respect to the employment rate, the decentralized system is the best performer with respect to the share of permanent employment and earnings growth and the polarized system performs best on unemployment and the wage share.

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Introduction

The way that industrial relations are organized and the role that unions play in this system vary a lot between European countries. It is often suggested that the type of industrial relations system and the embeddedness of unions matter a lot for the functioning of the unions. Nevertheless, up to date little is known about the effect of the industrial relations system on the realization of the goals of trade unions. For instance, do the unions in the Dutch 'Polder model', which is characterized by a strong formal and informal embeddedness of unions at both the sectoral and the central (national) level, better succeed in realizing their goals than the unions in the UK, where they play a much more modest role, in particular at the national level?

Admittedly, there is an abundance of internationally comparative research available, focusing on industrial relations. Specifically, collective bargaining, which has proven to be a powerful tool in order to maintain employment and enabling companies to find flexible solutions to face severe economic difficulties (Glassner & Keune, 2010), is often the centre of attention in academic research (OECD, 2019c; Braakmann & Brandl, 2016; Flanagan, 1999; Calmfors & Driffill, 1988). For instance, Calmfors & Driffill (1988) studied the relation between the centralisation of collective bargaining of wage–setting and employment. They found that extremes, meaning the highly centralised and highly decentralised systems, work the best. Another example is Braakmann & Brandl's (2016) study, which focused on the relation between the degree and level of integrative interaction between bargaining units and companies' productivity. They concluded that the productivity of companies in coordinated sector–, and multi–level systems is higher than the productivity in other systems.
Although previous research has provided captivating insights into industrial relations systems, there are some lacunae in the literature. First, most studies used only a limited number of indicators for collective bargaining. For instance, many studies are limited to input indicators such as the degree of centralisation and/or coordination of collective bargaining (Calmfors & Driffill, 1988; Calmfors, 1993; Soskice, 1990; Traxler, Blaschke, & Kittel, 2001). Besides, the role of social partners in the social dialogue with the government or other indicators of their functioning are often not, or only to a limited extend, taken into account (Calmfors & Driffill, 1988; Calmfors, 1993; Soskice, 1990; Traxler, Blaschke & Kittel, 2001, Braakmann & Brandl, 2016). However, these aspects are essential characteristics of industrial relations

systems. For instance, the Dutch Polder Model is well-known for the consultation culture between social partners (Keune, 2016).

Regarding the outcome indicators, the focus in previous studies was mostly limited to some general socio–economic indicators such as employment, wages, and sometimes inequality. (OECD, 2019c; Gardawski & Towalski, 2020; Calmfors & Driffill, 1988; Flanagan, 1999). Sspecific trade union goals, such as job security, the adequacy of pensions (De Beer, 2004), or the wage share (Lansley & Reed, 2013) are often left out. Arguably, the indicators used in most studies do not capture the complexity of industrial relations systems and are not able to take into account the broad variation in these systems adequately. As stated by the OECD (2019c) and Braakmann & Brandl (2016), systems should be considered holistically and not as a collection of separate indicators.

In some studies of industrial relations systems, country categorization or clustering was used to study whether clusters systematically differ in socio-economic outcomes. A recent example is the study of the OECD in the *Employment Outlook 2018*, which distinguishes five clusters based on three characteristics: the predominant bargaining level, the degree of centralisation, and the extent of coordination, taken from the dashboard in the OECD *Employment Outlook 2017* (OECD, 2018b, p. 81; OECD, 2017, p. 164). In 2015, the Netherlands belonged to the organised decentralised and coordinated collective bargaining systems, including Austria, Denmark, Germany, Norway, and Sweden (OECD, 2018b, p. 81). The OECD examined whether the performance of these five clusters differs with respect to socio–economic outcomes, such as employment. Another study that used country clustering is the one by Visser (2009), who clustered countries into industrial relations systems on theoretical grounds.

This study tries to fill the void in the available literature in the following manner. First, this study will search for the effects of the industrial relations system and the embeddedness of unions, measured by a broad range of indicators of industrial relations, on the performance with respect to trade union goals. These industrial relations indicators vary from the widely used centralisation indicator to the role of social partners and works councils. Also, specific trade union and employers' organisation indicators, such as density rates, will be taken into account as indicators of the industrial relations system. With these input indicators, contrary to previous research, this study will form country clusters based on a statistical cluster analysis. Subsequently, the performance of these country clusters on trade union goals will be compared. The three overarching trade union goals this study focuses on are employment, income, and equality. The indicators measuring these trade union goals will vary from the

employment rate to the wage share and the gender wage gap. Other trade union goals regarding social security, working conditions, training, et cetera are beyond this study's scope.

Based on the above, the overarching question in this study is 'what is the effect of the industrial relations system and the institutional embeddedness of trade unions on the realisation of trade unions' goals'. After an overview of the relevant literature and concepts, this study, first, constructs a number of country clusters based on indicators of the industrial relations system. Next, differences between these clusters in trade union goal performance will be explored. It will also be examined whether the country clusters add explanatory power to the separate industrial relations indicators, and, therefore, whether it is the industrial relations system as a whole and not solely its components that matter. In this way we try to find out whether the extent of the institutional embeddedness of trade unions in industrial relations systems matters for the realisation of trade union goals, and which specific systems perform best with respect to different goals.

This working paper is structured as follows. In the next section we will go deeper into the meaning of the concept of industrial relations. Next, three components of any system of industrial relations will be discussed, viz. collective bargaining, social dialogue, and the social actors (trade unions, employers' organizations, the state and works councils). Subsequently, we give a brief overview of previous studies of clusters of collective bargaining or industrial relations systems and we discuss three broad categories of trade unions' goals. In the next section we set out which data we used for this study and which statistical methods we applied to construct country clusters and to establish the performance of these clusters with respect to trade unions' goals. Thereafter we will first present the outcome of the cluster analysis, accompanied by a typology of the country clusters and a comparison with previous clustering. Finally we will analyse to what extent the industrial relations clusters differ with respect to the realization of union goals, taking account of the effect of the potential other explanatory variables. We also test whether the use of country clusters has added value compared to the inclusion of separate indicators of industrial relations and we perform a robustness check. The last section will summarize the main results and will discuss some limitations of this study.

Defining industrial relations

In the literature, many definitions of industrial relations can be found. Hoffman, Hoffman, Kirton–Darling, and Rampeltshammer (2002) define industrial relations as a network of institutionalised relationships between representatives of trade unions and employees, the representatives of employers' organisations and employers, and the state. The authors also include the existence of various actors and different levels of operations in this definition. The European Commission (2000) defines industrial relations in a more general way: employment, labour or industrial relations regulate the relationship between employee and organisation, and between citizens and society. Hyman (1975) focusses more on collective workers' action and organisation and defines industrial relations as controlling processes of work relations.

While the various definitions focus on different aspects, according to Weiler (2004, p. 13) the key definition can be captured in elements subtracted from the definitions mentioned above. These elements are controlling processes of work relations and regulation of interests, an institutionalised network with relationships between organisations or institutions and actors, collective relations, interaction on several levels, operation on various domains and in an institutional and legal framework, and the existence of cooperative but also conflictive relations. Elements such as the diversity of national models of industrial relations, supranational level industrial relations, and political, social, economic and cultural relations are included in this overarching definition of industrial relations.

In line with Weiler, this study will start from a rather broad interpretation of industrial relations, including all relations between *collective* actors (including trade unions, employers' associations, works councils and the state) regarding the processes and conditions of employment (including government policies that affect these).

In the next sections we discuss two key components of a system of industrial relations, viz. collective bargaining and social dialogue (both tripartite and bipartite), and subsequently the four central actors in an industrial relations system, viz. trade unions, employers' organisations, the state and works councils.

Collective bargaining

Collective bargaining has a prominent place in the academic literature on industrial relations. The ILO (2011) defines collective bargaining as negotiations established between a group of employers, a single employer, or one or more employers' organisations on the one hand, and a single or various employee organisations on the other hand for various purposes. These purposes can include the regulation of the terms of employment and working conditions, the regulation of the relation between employers and workers, and the regulation of employers' organisations or employers themselves and/or one or more employee organisations.
European countries vary widely in their collective bargaining's institutional structure (Braakmann & Brandl, 2016). Countries differ with respect to the extent of centralisation, coordination, flexibility, and governability of collective bargaining (OECD, 2019c).

Centralisation and coordination

Centralisation and coordination are two key characteristics of any collective bargaining system. Centralisation refers to the dominant level at which collective bargaining takes place and can vary from national level (fully centralized) via sectoral or industry level (intermediate) to company level (fully decentralized) (Braakmann & Brandl, 2016). Coordination refers to the degree to which major actors' decisions are purposely followed by the minor actors (Kenworthy, 2001). According to the OECD (2019c), coordination can occur between bargaining units at the same level or at different levels.
According to Boeri et al. (2001, pp. 71–75), coordination and centralisation are essential mechanisms in collective bargaining by which unions can influence labour market outcomes. To expand, unions are mostly interested in national or industry-level wage negotiations of a coordinated type. Wage agreements established at national level, also called formally centralised, are the highest form of coordinated bargaining. When it is hard for unions to reach this formal centralisation, unions can strive to coordinate wage bargaining at the sectoral or the company level.
Also in other academic research on collective bargaining systems, which does not explicitly focus on the union perspective like Boeri et al. (2001, pp. 71–75), the focus is often on the key elements of centralisation and coordination (Calmfors & Driffill, 1988, Calmfors, 1993; OECD, 2018b; OECD, 2019c; Braakmann & Brandl, 2016). Regarding the degree of centralisation, countries differ much in the dominant type of bargaining level, i.e. whether the majority of employees is covered by national, sectoral, or company-level agreements. While

most European countries were characterised by multilevel bargaining (i.e. bargaining at various levels) since the 1930s (Boeri et al., 2001, pp. 71–75), today the predominant level of bargaining is mostly the sector or industry. However, Finland and Belgium are still characterised by national level collective bargaining, while for instance in Romania, the Czech Republic, Hungary, Greece, the UK, Ireland and Poland, the company-level is the dominant type (Braakmann & Brandl, 2016).

In the 1980s, the dominant corporatist view in the academic literature was that a higher degree of centralisation would lead to better labour market performance (Cameron, in OECD, 2019c). However, in the 1990s, another theory became popular: the U-shape hypothesis of Calmfors and Driffill (1988). According to this hypothesis, both full centralisation and decentralisation would lead to good performance, whereas sectoral bargaining would produce the worst outcomes on macroeconomic indicators such as employment compared to the other bargaining levels. However, later empirical studies showed that bargaining systems with a similar score on (de)centralisation were characterized by different outcomes. Also some countries with predominant sector level bargaining performed relatively well. These empirical results showed that using centralisation as the single indicator to characterize a collective bargaining system was far too simplistic (OECD, 2019c).

Consequently, the degree of coordination was added as an essential variable in explaining variation in labour market outcomes (OECD, 2004; OECD, 2012). As a result of coordination decentralisation of bargaining does not necessarily result in entirely independent negotiations and fragmentation (OECD, 2012; OECD, 2017). According to the OECD (2019c), coordination can occur between same level bargaining units and between units at different levels. An example of coordination of units at the same level is that the standards that are set in a particular sector are being followed by other sectors. An example of coordination between different levels is that the recommendations that are formulated in a social pact are being implemented in sector or company-level agreements. Overall, coordinated collective bargaining seems to lead to more wage equality and higher employment than completely decentralised systems (OECD 2019c).

Kenworthy (2001) distinguishes between the mode, or type, of coordination, and the degree of coordination. The actual degree of coordination refers to the extent to which minor actors intentionally follow the wage agreements by major actors. Some examples of modes of coordination are pattern bargaining, intra- and inter-associational bargaining, and state–imposed bargaining. According to Traxler, Brandl, and Glassner (2008), pattern bargaining, meaning that a specific bargaining unit at the company or industry level defines the norms

that other units at the same level follow, is the most decentralised form of coordination. The OECD (2019c) refers to intra- or inter-associational bargaining as high-level units establishing rules or principles that lower-level bargaining units have to follow. The state-imposed type of bargaining refers to bargaining based on legal rules, including minimum wages in a binding form, or indexation rules. The latter type is the strongest form of coordination.

The OECD (2019c) explored the mode of coordination of various countries. Denmark, Germany, Austria, Finland, Norway, Sweden, and the Netherlands have a high degree of coordination and pattern bargaining. The only example of state-imposed bargaining with a high degree of coordination is Belgium; a legal minimum wage and indexation of living costs are used. With this indexation wages in Belgium are linked to the wage developments in three neighbouring countries, Germany, the Netherlands and France. Also, France has state-imposed bargaining; however, the degree of coordination is low. Besides, countries like Finland, the Netherlands, Norway, Sweden, Switzerland, and Austria have a high degree of coordination combined with, inter- and/or intra-associational bargaining. On the other hand, France, Portugal, Spain, Slovenia, and Italy have a low degree of coordination and intra- and/or inter-associational coordination. The bargaining systems are mostly uncoordinated in Eastern and Central European countries and in other decentralised systems (OECD, 2019c).

Flexibility and extensions

Although centralisation and coordination are often seen as the key characteristics of collective bargaining systems, they cannot fully capture the way that collective bargaining systems' function in practice. An important third element of a collective bargaining system is its flexibility. Aspects like derogations, opt-out clauses, and the favourability principle determine collective bargaining systems' flexibility. Flexibility can be defined as the possibility for lower levels to deviate from the terms set in higher-level agreements. For instance, in countries like Austria and Germany, the sectoral level bargaining agreements are the predominant ones, while also space is left for agreements on a company-level to set less favourable conditions for the employees. In countries like Slovenia and Italy, the terms set in higher-level agreements rule while company-level bargaining is restricted. On the other hand, in Scandinavian countries, a framework sets out agreements at the sectoral level and leaves space for company-level bargaining (OECD, 2019c).

A specific feature of collective bargaining systems that increases its flexibility is the

favourability principle (OECD, 2019c). Such a favourability principle refers to agreements on the lower level that can only outweigh agreements at higher levels if it improves employees' employment conditions (Marginson, 2014). In other words, with the favourability principle, the employment terms for employees cannot become worse but only improved by lower–level agreements. In some cases, the favourability principle goes beyond only wages and covers various conditions set in higher-level agreements (Boeri, 2014). In some cases, an inversed favourability principle applies, which means that lower-level agreements take precedence over higher level agreements and may, thus, also stipulate less favourable conditions for employees (Visser, 2019, p.10). In most of the Scandinavian countries, Hungary, France, Portugal and the Netherlands, the parties participating in the negotiations decide whether the favourability principle is in place. In other countries, including Belgium, Austria, the Czech Republic, Ireland, Germany, Italy, Poland, Slovenia, Switzerland, and the Slovak Republic, the favourability principle is always in place. In Greece and Spain, however, the principle never applies (OECD, 2019c).

Another element of collective bargaining that can increase its flexibility are derogations (Voss, Schöneberg, & Rodriguez Contreras, 2015; OECD, 2019c). The exact meaning and working of derogations differ among countries.

Two types of derogations that can be distinguished are general and temporary opening clauses. When a general opening clause exists, agreements at the company level can derogate from the terms set in agreements at higher levels (Voss et al., 2015; OECD, 2019c). An example is Finland, where it has become common since the '90s to use opening clauses which allow bargaining processes at the company level, often about flexibility of working time (Voss et al., 2015). On the other hand, opt-out clauses, also called temporary opening clauses, refer to lower bargaining levels being allowed to derogate from regulations set in higher-level agreements during difficult economic times (OECD, 2019c; Visser, 2016; Voss et al., 2015). These temporary opening clauses gained popularity during the previous economic crisis (Visser, 2016).

Whereas the flexibility of collective bargaining can be enhanced by the favourability principle and derogations, it can also be limited by extension of collective bargaining agreements. The use and form of extensions differ much among countries (OECD, 2019c). Visser (2018) give the following definition: "Extension is a public policy act based on legislation that mandates the government, a public agency or a court to declare a collective agreement between trade union(s) and employers' association(s) generally binding on all employers operating in the sector or occupation irrespective of whether they are members of the organizations that signed

the agreement." Boeri et al. (2001, pp. 79–80) studied extensions among European countries with data from the mid-'90s and found that France, Austria, and Belgium regularly used legal extensions, while in Denmark, Norway and Sweden extensions of a legal and obligatory type did not exist. The more recent work of the OECD (2019c) shows that while agreements cover all companies in Spain and Italy, also called extended by default, in countries like Ireland, Sweden, Denmark, the UK, and Poland, extension mechanisms are not present. In-between is France, where extensions are semi-automatic with some light criteria, and Germany, where extensions are based on strict and binding criteria. In the Eastern and Central European countries, extensions are overall very rare.

Governability

Another important feature of a collective bargaining system is its governability. With governability, Traxler (2003) refers to the capacity of vertical coordination. He sees high governability as legal enforceability of collective agreements, including peace obligation by law.

Governability or enforceability can be realized in a variety of manners. For instance, with the use of peace clauses, striking on matters included in the collective agreement is forbidden by the unions which signed the specific agreements and their members. The use of peace clauses differs much among countries. The Nordic countries have a high degree of trust between partners and a strong role of unions; therefore, peace clauses are regularly used and enforced. In countries like Italy and Spain, peace clauses are a common phenomenon which stipulate that only the parties who signed the agreement cannot strike. Therefore, they do not bind parties that did not sign the agreement. On the other hand, in France and Belgium, peace clauses are limited because it conflicts with the right to strike (OECD, 2019c).

Lastly, also arbitration and mediation can function as a mechanism to achieve enforceability. In two-thirds of the OECD countries mandatory mediation is present, and around half of the countries are characterised by mediation or arbitration procedures at both the company and sectoral level (OECD, 2019c). Although in all of the Nordic countries mediation procedures exist, the precise form differs. While Finland and Norway both seem to move towards a conflict resolving culture, Sweden is characterised by only some use of mediation procedures, but it is not common. Denmark is somewhere in-between these countries (Nylund, Ervasti, & Adrian, 2018).

Social dialogue

Social dialogue is an essential and extensive aspect of the industrial relations system. According to the ILO (2005) some view social dialogue as all forms of consultation and negotiation, in tripartite or bipartite form, taking place at all levels and with the (potential) involvement of the government, employees and employers. Others see social dialogue predominantly occurring at higher levels, in particular the national or sectoral level. While some also include conflicted relations in social dialogue's definition, others limit social dialogue to relations of a cooperative type. The ILO (n.d.) defines social dialogue broadly. It covers the consultation, negotiation, and information exchange between employees, employers and the government on economic and social policy-related topics of common concern. This definition covers both bipartite and tripartite processes.

According to the ILO (n.d.), three types of social dialogue activities can be distinguished: information-sharing, consultation, and negotiation. First, information-sharing is the most low-key type of social dialogue activities. Although this type does not include discussion or specific action, it is an essential part of social dialogue and forms the basis for other social dialogue activities. Secondly, consultation means that social partners exchange opinions. Sometimes the bipartite or tripartite social dialogue is only informative and consultative, while in other cases it aims at reaching binding agreements. Lastly, negotiation refers to the parties participating in collective bargaining on all levels: international, national, regional, sectoral and company level.

An important distinction is that between tripartite social dialogue, in which the state interacts with employers' organizations and unions, and bipartite social dialogue, in which the state is absent as an actor.

Tripartite social dialogue

Tripartite social dialogue can be defined as the interaction of employees, employers, and the government through their representatives, functioning as independent and equal social partners looking for solutions to matters of common concern (ILO Thesaurus, in Araújo & Meneses, 2018). The success of tripartite social dialogue depends both on a governments' attitude and willingness to engage in social dialogue with the social partners and the power of the bipartite social dialogue, which functions as the foundation for tripartite social dialogue (Engin, 2018).

Tripartite social dialogue differs much between countries. For instance, France and Germany

are two countries characterised by a well-functioning tripartite social dialogue system (Araújo & Meneses, 2018; Engin, 2018). In Germany, social dialogue is not institutionalised but is very powerful. This power can be assigned to the successful bipartite social dialogue and the positive attitude of the government. Even during the economic crisis, social partners played an active role in the policymaking with the government (Engin, 2018). Despite the unfavourable situation in most Mediterranean countries, also France succeeded in overcoming the crisis, with its evolving tripartite dialogue and large number of tripartite bodies (Engin, 2018). Austria and the Netherlands are also characterised by a well-functioning tripartite social dialogue system. An example of a tripartite body in the Netherlands is the Social and Economic Council, which advises the government about economic and social policy and legislation (De Vries & Safradin, in Araújo & Meneses, 2018). An example of tripartite social dialogue in Austria is the 'social partner agreement' of 2006, which states that social partners and the government meet at least twice a year and have a formal dialogue on relevant socio-economic topics. However, also informal tripartite social dialogue is common in Austria (Meier & Tiefenbacher, in Araújo & Meneses, 2018).

In other countries, the tripartite social dialogue broke down during the previous economic crisis. For instance, in Croatia, the Czech Republic, and Bulgaria, the social dialogue institutions at the national level did not function well (Engin, 2018). Also, in the Mediterranean countries, many tripartite social dialogue systems collapsed. Resulting from the crisis in Greece, the government made decisions without consulting the social partners. Another example is Portugal, where historically, the social partners participated in tripartite social dialogue, whereas tripartite dialogue has shown to be incapable of sustaining during and after the crisis. On the other hand, Italy was characterised by a non-institutional structure of tripartite social dialogue, which was seen as a system's weakness by social partners. Therefore, a stronger relationship with the government would be needed to recover and evolve effective tripartite social dialogue (Engin, 2018).

Many countries do not have a formally mandated tripartite body. However, Engin (2018) stresses that it is not necessary to have formal and legally regulated tripartite social dialogue institutions to have a sustained tripartite social dialogue. However, when tripartite social dialogue fails, this can be compensated by a well-functioning bipartite social dialogue (Engin, 2018).

Bipartite social dialogue

The term bipartite social dialogue refers to a dialogue between one or more employers' organisations or employers, and one or more trade unions (or confederations), who consult, inform, and negotiate with each other without intervention from the government. Although the government in bipartite social dialogue is not a partner, governments can assist the process (ILO, 2013).

Traditionally, countries differ much in the type of bipartite social dialogue, for example regarding the level of collective bargaining (see below). An example of an influential bipartite body is the Foundation of Labour ('*Stichting van de Arbeid*') in the Netherlands. This bipartite body establishes consultation between employers' organisations and union confederations and has an advising function for the government (De Vries & Safradin, in Araújo & Meneses, 2018).

The relative importance of bipartite and tripartite social dialogue may shift over time. Spain is an example of a country where a successful bipartite social dialogue replaced tripartite social dialogue (Engin, 2018). Therefore, bipartite social dialogue in Spain is seen as a source of stability in collective bargaining (Molina & Miguélez, 2016). Countries in which bipartite social dialogue faced more difficulties were the Central and Eastern European ones; a lack of trust between social partners led to difficulties with implementing collective agreements resulting from the bipartite social dialogue (Engin, 2018).

Social pacts

One outcome of a successful social dialogue can be a social pact between the negotiating parties (Ishikawa, 2003). Baccaro & Galindo (2018) define a social pact as an agreement between trade unions, employers' organisations, governments, and potentially other organisations at the peak–level. A social pact can be bipartite, for instance, with the government solely being supportive, or tripartite, with the government being involved as a third party in the process (Traxler, 1999). In most cases, national social pacts cover more social and economic policy topics than only (the moderation of) wages (Fajertag & Pochet, 2000). Social pacts are often seen as an alternative way of centralisation. However, most national social pacts do not imply actual centralisation of wage bargaining, since the principles and procedures for collective bargaining that are stated are merely recommendations and do not limit the freedom of negotiations at the industry and/or company

level. Nevertheless, social pacts can be viewed as instruments that strengthen the central coordination of collective bargaining (Regini, 2001).

Social actors

According to the classic study of Dunlop (in Bamber et al. 2004, p. 8), three types of actors with their representative organisations operate in an industrial relations system. These three parties are the employers, represented by employers' organisations, employees, represented by the trade unions, and the state. These three parties are often indicated with the term 'social actors', whereas in Western European countries the employers' organisations and the trade unions are often referred to as the 'social partners'. A fourth type of actor that will be discussed in this section are works councils, which in many countries act as representatives of employees at the company level vis-à-vis the management.

Trade unions

That trade unions play a crucial role in any system of industrial relations hardly needs explanation. Nevertheless, the exact role they play and the predominant level at which they are active varies strongly between European counties and has also changed over time. Unions have been a significant source of power and have influenced the labour market's design in many countries (Boeri et al., 2001, p. 3). However, the power of unions is partly determined by employers, or employers' organisations' willingness to negotiate with them, and the legal framework in which they operate (Boeri et al., 2001, p. 79).

An important indicator for trade union presence, that is used in many studies, is union density, which can be defined as the proportion of employees which is a trade union member. This rate differs much between countries. Within the OECD it ranges from 4.7 per cent in Estonia, up to 91 per cent in Iceland in 2018. There is also much variation over time. On average, union density within the OECD decreased from 33 per cent in 1975 to 16 per cent in 2018. However, in Belgium and Iceland, union density increased over the same period, while it was stable, for instance, in Norway (OECD, 2019c).

Union density is, however, only one feature of unions that determine their role and influence. Another characteristic is the (power) relationship between peak-level union confederations and their affiliates, that often operate at the sectoral and/or company level and sometimes at the regional level. Confederations can play an important role in the coordination of union activities, for example with respect to collective bargaining, but this depends strongly on the power they have over their affiliates (Brigden, 2007).

Another important aspect of unions' presence is the extent of fragmentation or concentration and the number of confederations. More fragmentation and plurality among unions will

hamper wage-coordination (Ebbinghaus, 2003). While, for instance, Austria has only one major union confederation, Norway and the Netherlands have three and France (at least) five. The number of affiliates of union confederation can also differ much. Whereas, for instance, the DGB in Germany has 8 affiliates, the ICTU in Ireland has 55 (Ebbinghaus, 2003).

Employers' organisations

In a way, employers' organisations are the 'natural' counterpart of the unions and often were created in response to the perceived threat by the unions (Windmuller & Gladstone, 1984). Later on, employers' organisations role changed, and they gained a prominent role within the collective bargaining framework in many European countries (Behrens & Traxler, 2004). However, due to a decentralisation trend in many European countries, the role of employers' organisations in collective bargaining declined again (Demougin, Gooberman, Hauptmeier, & Heery, 2019).

Whereas union density is commonly taken as an indicator for union strength, relatively little is known about employers' organisation density. Because of the wide spread in the size of companies, employers' density is not defined as the proportion of employers that is a member of an employers' organisation, but as the proportion of all employees that are employed by these companies. This implies that large companies have a much larger weight in calculating employers' density than small and medium sized companies.

Just like trade union density, employers' density differs much between countries. On average, it is around 59 per cent in OECD countries and thus much higher than average union density. Countries characterised by a low employers' density rate include the Eastern and Central European countries, while in countries like Belgium, Sweden, the Netherlands, and Luxembourg, the rates are up to 80 per cent. In Austria, employers' density is even 100 per cent, since companies are obliged to join an employers' organisation (OECD, 2019c).

Similarly as with respect to unions, the fragmentation or concentration and the number of employers' confederations are important aspects of employers' organisations' presence. Behrens and Traxler (2004) show that European countries differ much in the number of employers' associations at the peak level. Whereas Belgium, Luxemburg, the UK, and Germany have only one employer confederation at the national level, Italy has 16. Also the number of employers' associations that are affiliated with a confederation differs. For instance, in Greece, 78 associations are affiliated to the employers' confederation SEV,

whereas in the Netherlands, the confederation for medium and small-sized companies, MKB–Nederland, has about 500 affiliated associations (Behrens & Traxler, 2004).

The state

According to Blyton, Heery, Bacon, and Fiorito, (2008), three roles of the state in employment relations can be distinguished: accumulation, pacification, and legitimation. While accumulation refers to supporting productivity, economic performance, and competitiveness, pacification focuses on maintaining integrity, resolving conflicts, or maintaining the social order. Legitimation refers to the state's role in the pursuit of social equity, which often goes hand in hand with market corrections and interventions, and the promotion of employee voice at the workplace. To promote legitimation, social partners can be involved in the shaping of social and economic policy.

More concretely, it is useful to distinguish between the role of the state as a lawmaker, which creates the legal framework for the system of industrial relations, and as a participant in industrial relations, next to the social partners. The state as legislator is responsible for the formal rules regulating collective bargaining (including the mandatory extension of collective agreements), strikes, co-determination, minimum wages, et cetera. As a participant, the state may discuss with and consult the social partners on relevant issues, including government policies on employment and income (tripartite social dialogue). This may sometimes result in social pacts. The state can also directly interfere in bargaining processes, for example by imposing a wage freeze. The state also plays a role as an employer of civil servants, but this role will be left out of consideration in this paper.

States differ much in the role they play in the industrial relations system. For instance, whereas in the Nordic countries states played a supportive social democratic role and regularly consulted unions and employers, in the UK, the state was largely absent and relied on the unfettered working of the market. In the post-communist countries, like Poland, Hungary and the Czech Republic, the state set the framework of rights, but further intervention by the state is limited (Glassner & Keune, 2010).

Works councils

Whereas the characteristics of industrial relations systems that were discussed in the previous sections refer primarily to the relationship between employers and their representatives on the on the one hand, employees and their representatives in the form of trade unions on the other

hand, and the state as a potential third party, the final component that we consider is the representation of employees' interests within a company and the social dialogue with the management. In most countries, the interests of workers within a company are primarily represented by a works council or a similar body. Works councils are defined by Rogers and Streeck (1995) as institutions of representative communication between employer and employees in a particular company. Works councils represent all employees of the company, regardless of whether they are a union member or not. Boeri et al. (2001, p. 81) claim that the works council is an ideal solution, without the direct involvement of trade unions, to solve the exit-voice-problem. It offers employees the opportunity to express dissatisfaction without having to quit their job. Works councils can function as a source of information which provides feedback on, for instance, workplace organisation. It can also function as a mechanism by which unions can exert influence within the company (through membership of union members of the works council), despite a low union membership rate.

The presence, form and rights of the works councils differ much between countries (Boeri et al., 2001, p. 81; Rogers & Streeck, 1995; Degrauwe et al., 2018; Oesingmann, 2015). For instance, in countries like France, Germany, Austria, Belgium, Spain, and the Netherlands, a works council is mandatory for companies of a specific size. In some countries, the works councils fulfil some tasks that were historically fulfilled by trade unions. An example thereof is Spain, where works councils have a legally acknowledged role in wage bargaining (Boeri et al., p. 81). On the other hand, works councils are rare in countries like Portugal, Croatia, Greece, and the Czech Republic, because legislation regarding works councils is not common yet, or because works councils are mostly not mandatory. In countries like Romania and Finland, works councils' existence is exceptional because employee representatives are only permitted when there are no union representatives (Oesingmann, 2015).

According to Degrauwe et al. (2018), works councils' rights can be divided into three categories. First, the lowest level of rights is information. The right to information means that the employer is obliged to communicate particular information to the works council. Second, the right to consultation implies that works councils have the right to share their opinion before employers implement decisions (Degrauwe et al., 2018). In most of the countries in Western Europe, the works councils have gained not only the right to information but also consultation in decisions (Rogers & Streeck, 1995). Lastly, the highest level of rights a works council can have is the right to codetermination. This right exists in cases where the works councils' permission is needed before the management can undertake specific actions. In most European countries, works councils do not have the right to codetermination (Degrauwe et al.,

2018). A typical example of a country where the right to codetermination for the works councils about specific topics exists is Germany (Rogers & Streeck, 1995).

Country cluster comparison

Country clustering is an important aspect of the international comparative research approach in which a systematic pattern is sought in the similarities and differences between industrial relations systems. In this type of research, countries are classified according to their similarity with respect to several industrial relations characteristics. Thereafter it can be examined whether these clusters differ systematically in socio-economic and labour market outcomes. However, despite the abundance of studies of industrial relations systems, the number of studies that use country clustering to compare types of industrial relations systems is limited (Calmfors & Driffill, 1988; Braakmann & Brandl, 2016; OECD, 2018b; OECD, 2019c; Visser, 2009). There are some similarities but also significant differences between the classifications that researchers have developed up to date. In the next paragraphs, first, an overview of the available classifications will be given. Next, the similarities and differences between these studies' classifications will be discussed.

First, Calmfors and Driffill (1988) used only (de)centralisation of wage bargaining to distinguish between country clusters. They defined centralisation as "the extent of inter-union and inter-employer cooperation in wage bargaining with the other side" (ibid., p.17). This definition differs from others, which focus more on the formal aspects of wage bargaining instead of the content in practice. Subsequently, the authors ranked countries according to the extent of centralisation. On this ranking Austria came first (most centralized), followed by Norway, Sweden, Denmark, Finland, Germany, the Netherlands, Belgium, et cetera. From the European countries, Switzerland was lowest in the ranking, followed by Italy, the UK, and France. Next, Calmfors and Driffill divided the countries into three clusters. The first cluster, called centralised economies, where bargaining took mainly place at the central (national) level, was formed by Austria, Norway, Sweden, Denmark, and Finland. The cluster of intermediate economies, where the industry or sector was the dominant bargaining level, was formed by Germany, the Netherlands, Belgium, New Zealand, and Australia. Lastly, the decentralised economies, where most bargaining takes place at the company level, included France, the UK, Italy, Japan, Switzerland, the US, and Canada.

Second, Braakmann and Brandl (2016) developed an extensive classification of collective bargaining systems. They argued that not only the level of collective bargaining but also the degree of integrative interactions matters for the effectiveness of a system. Their classification is based on the level of collective bargaining, the degree of vertical governability, and horizontal coordination. Coordination is defined by the authors as a horizontal type of

interaction between bargaining units at the same level. For example, specific sectors follow the collective agreement signed in another sector. In an uncoordinated bargaining system, different units at the same level act independently from each other. In a coordinated collective bargaining system formal or informal integrative interaction exists between units at the same level. Vertical coordination, or governability, is the interaction between units at different levels. For example, a company-level agreement may deviate from an agreement at the industry level under certain conditions. A system is ungoverned when units at different levels act independently from each other. In a governed system there is integrative (inter)action between the units at different levels.

Based on these indicators, Braakmann and Brandl (2016) distinguished 13 types of bargaining systems, divided over the 28 EU member states. The clusters consisted of one-, two-, and three-level bargaining systems. Four types of one-level bargaining systems can be distinguished: a) company-level bargaining, b) coordinated sectoral bargaining, c) uncoordinated sectoral bargaining, and d) national level bargaining systems. Besides, there are six types of two-level bargaining systems: e) company- and sector-level bargaining, f) company- and national-level bargaining, and g) sector- and national-level bargaining, with all having both a governed and ungoverned variant. Finally, a three-level system is distinguished: h) company-, sectoral- and national-level agreements, with a governed and an ungoverned variant. These categories are not mutually exclusive; multiple bargaining systems may exist in a country. Therefore, the 28 countries cannot uniquely be allocated to one of these systems.

Third, the OECD presented a clustering in the *Employment Outlook 2018* (OECD, 2018b), which was further elaborated in the OECD (2019c) and in Garnero (2020). The OECD (2018b) constructed five clusters based on two components: the degree of centralisation, which includes the predominant collective bargaining level, deviations, opt-out clauses, extensions, and the use of the favourability principle, and second, the degree of wage coordination between collective agreements at the sectoral level. Although the OECD distinguishes five country clusters based on these components, it is not clear how exactly the clusters are constructed.

The first cluster is called the predominantly centralised, but weakly coordinated system. In this category, a prominent role is attributed to the sectoral agreements. Besides, while the use of extensions is common, coordination regarding wages is absent, and the derogation of agreements signed at a higher level is an option but in practice limited used or even absent. Countries classified in this category were, in 2015, France, Italy, Iceland, Slovenia, Spain, Portugal, and Switzerland. The OECD (2019c) adds that Switzerland and Spain initially

belonged to an intermediate group in between the organised decentralised and centralised systems. Because the number of observations was too small for further statistical analyses, both countries were added to the predominantly centralised but weakly coordinated systems.
The second cluster is called the predominantly centralised and coordinated collective bargaining system. Here again, the sectoral level agreements play a prominent role, but there is only a limited and restricted possibility to derogate from agreements signed at higher levels. In contrast with the previous category, the coordination across sectors is strong. Only Finland and Belgium belonged to this cluster in 2015.
The third cluster consists of countries with an organised decentralised and coordinated system. Again, the sectoral level plays a prominent role, but there is space for lower–level agreements to fill in the details, for example via opt–outs or the use of extensions. The countries belonging to this cluster are characterised by strong coordination between bargaining units and sectors. Sweden, Norway, Denmark, Germany, the Netherlands, and Austria belonged to this category in 2015.
The fourth cluster is called the largely decentralised collective bargaining system. In this cluster bargaining at the company level is dominant, but also sectoral level bargaining and coordination of wages are present. The use of extension mechanisms is minimal in this category. Greece, Luxembourg, and the Slovak Republic belonged to this category in 2015, together with Japan, Australia and Ireland.
Lastly, the completely decentralised collective bargaining systems form the fifth cluster. Here, bargaining is mostly limited to the company level, with restricted or no government involvement and coordination. In 2015, among the European countries, Latvia, Lithuania, Poland, the UK, Turkey, Estonia, Hungary, and the Czech Republic belonged to this group.
While the previous studies focused on collective bargaining, the clustering of Visser (2009) encompasses industrial relations in a broader sense. Visser's clustering is primarily based on theory, in particular theories of employment regimes (Gallie, 2007), production regimes (Hall & Soskice, 2001) and industrial relations regimes. Based on these theories, Visser constructed a number of ideal-typical clusters and then tested it by exploring the variance of industrial relations indicators between a number of countries. These indicators include union density, union authority, union concentration, centralisation, bargaining coverage, employer density, sectoral organisation, employee representation, and concertation.
The first cluster, North and organised corporatism, consists of Finland, Sweden and Denmark. This cluster is characterised by a relatively high union density rate, union authority, centralisation, bargaining coverage, and employee representation. In comparison with the high

union density rate, employers' density is relatively low.

The second cluster, called Centre and social partnership, consists of Belgium, Luxembourg, Germany, Slovenia, Austria, and the Netherlands. This cluster is characterised by a relatively high union authority, centralisation, bargaining coverage, and concertation. In comparison with the other clusters, this one is characterised by the highest employers' density. Besides, bargaining coverage is two to three times as high as union density.

The third cluster, South and state-centred, includes Portugal, Italy, France, Spain and Greece. This cluster is characterised by high bargaining coverage and employer density, but low union concentration. In this cluster, too, bargaining coverage is two to three times as high as union density.

The fourth cluster, West and liberal, includes Ireland, Cyprus, Malta, and the UK. This cluster has overall low bargaining coverage, employer density, sectoral organisation, concertation, and on average, a low employee representation. However, union concentration is the highest among the clusters.

Lastly, the fifth cluster, Transit–Mixed, includes the Slovak Republic, Romania, Poland, Hungary, Bulgaria, the Czech Republic, Estonia, Latvia, and Lithuania. This cluster has overall low bargaining coverage, employer density, sectoral organisation, union concentration, union density, union authority, bargaining coverage. Besides, this cluster has the lowest centralisation of the clusters, and it has the second–lowest union concentration.

Comparing these comparative studies' classifications, both similarities and differences can be observed. To begin with, all studies use the degree of centralisation as a component to base the classification on, or in the case of Visser to test the clustering (Calmfors & Driffill, 1988; Braakmann & Brandl, 2016; OECD, 2018b; Visser, 2009). Usually, centralisation is measured by the dominant level of bargaining (Braakmann & Brandl, 2016; OECD, 2018b; OECD, 2019c). Although with such subjective classifications, differences are inevitable, at least some clusters are quite similar. For instance, both in the study of Visser (2009) and in OECD (2018b) Spain, France, Italy, and Portugal belong to the same cluster.

Also, some differences in the country clustering can be distinguished. While in Calmfors & Driffill (1988), Austria, Norway, Sweden, and Denmark were appointed to the centralised system, in OECD (2018b), these countries belonged to the organised decentralised and coordinated systems. Besides, Calmfors & Driffill appointed France and Italy to the decentralised systems, while the OECD appointed those to the centralised and uncoordinated systems. Because studies differ in the indicators they use for the clustering, this can cause differences in country clustering. However, the large difference in timing of both studies

should also be taken into account, which may partly explain differences in clustering. Whereas Calmfors and Driffill (1988) based their clustering solely on the degree of centralisation, Braakmann & Brandl (2016) and the OECD (2019c) also included aspects like coordination and flexibility. Only Visser (2009) took into account a broader range of indicators, including union density, union concentration, and employers' density.
Although it can be argued that certain simplifications are needed to achieve statistical power (OECD, 2019c), it is also important to look at the system as a whole, and not solely focus on sets of separate indicators (Braakmann & Brandl, 2016; OECD, 2019c). Due to complementarities between the separate components of an industrial relations system, we expect that clusters can explain a larger part of the variance in outcomes, and in the performance on trade union goals, than if we only include the separate indicators (cf. Hall & Soskice, 2001).

Previous studies on the performance of industrial relations systems

Some of the country cluster comparative studies that were discussed in the previous section also estimated the impact of the type of industrial relations system on macroeconomic outcomes. In this section we give a brief overview of these studies.
Calmfors & Driffill (1988) studied the effect of the extent of centralisation on macro-economic performance. They concluded that there is a U-shaped relationship. The countries that they named 'intermediate economies', viz. Germany, Belgium, the Netherlands, New Zealand, and Australia, performed the worst on employment and unemployment. The centralised economies, formed by Sweden, Denmark, Finland, Norway and Austria performed the best, while the decentralised economies, including the UK, France, Switzerland, Italy, Japan, the US, and Canada, scored in-between.
In 1997, the OECD concluded that the relationship between (de)centralisation and economic performance that Calmfors and Driffill found, was not robust. However, the OECD did not find another relationship, but instead concluded "the evidence (...) does not show many statistically significant relationships between most measures of economic performance and collective bargaining" (OECD, 1997, 64). A follow-up study in 2004, confirmed this conclusion: "No robust associations are evident between the indicators of wage bargaining (...) and either the growth rate of aggregate real wages or non-wage outcomes, including unemployment rates." (OECD, 2004: 130).

However, in its most recent study, the OECD (2019c; see also Garnero 2020) did find at last a significant relationship between the type of collective bargaining system and a number of outcome variables. The OECD (2019c) found that coordinated systems, including organised decentralised systems, result in higher employment, lower unemployment and also lower earnings inequality than bargaining systems characterised by complete decentralisation. Bargaining systems with no coordination, but mostly centralised bargaining, are in–between. More precisely, the predominantly centralised and coordinated cluster, formed by Belgium and Finland, and the organised decentralised and coordinated cluster, formed by Austria, Denmark, Norway, Sweden, the Netherlands and Germany, score the best on employment, unemployment and earnings inequality. The cluster characterised by complete decentralisation, including Estonia, Latvia, Lithuania, the Czech Republic, Hungary, Poland, the UK, and Turkey, score worst. The centralised but not coordinated systems, including Spain, Slovenia, Switzerland, Italy, France, Portugal, and Iceland are in-between. Braakmann & Brandl (2016) found that multilevel or coordinated sector-level bargaining systems perform better on productivity than systems with national or company level bargaining. More specifically, the coordinated sectoral collective bargaining system, typical of Austria, the governed company and sectoral bargaining system, which is standard in Germany, and the national, sectoral and company-level bargaining of a governed type, common in the Nordic countries, showed better outcomes on companies' productivity compared to other bargaining systems. The systems characterised by uncoordinated sectoral and non-governed multilevel bargaining performed the worst on productivity.

Trade union goals

The academic literature on the goals of trade unions is remarkably sparse. According to Gumbrell-McCormick and Hyman (2013, p.1): "How far unions pursue narrow economic interests on the one hand, a broader social agenda on the other, changes over time and differs significantly between (as well as within) countries." Earlier, Hyman (2001) distinguished between three types of unions with strongly diverging (ultimate) goals. The market-oriented unions in English-speaking countries "have traditionally been viewed as organizations the primary purpose of which is to secure economic benefits for their members; in particular, by advancing their 'terms and conditions of employment' through collective bargaining." (ibidem, p.7) For class-based unions, with a strong link to socialist or communist parties, a radical reform or even overthrow of capitalist society was their ultimate goal. As their

revolutionary aims faded over time, their focus shifted to improving the employment conditions of workers. They also often followed "a relative egalitarian approach to wage policy" (ibidem, p.22). The third category of unions are part of civil society and aim for relations of social partnership with the employers and the state, in order to attain social reforms in the interest of workers. Although originally the orientations of these different types of unions varied widely, the contradictions have become less extreme over time. Even though significant differences remain, as Gumbrell-McCormick and Hyman (2013) note, arguably most unions these days endorse the economically oriented goals of the market-based unions, that is improving the terms and conditions of employment, or, more concretely, "to secure the best attainable wage-work bargain" (Hyman 2001, p.8).

Therefore, we assume that it is rather uncontroversial that most unions pursue at least two broad categories of goals, related to employment (work) and income (wage), respectively. More controversially, we add a third category of goals, which is most typical for the class-based or social-democratic unions, namely the egalitarian goal of reducing inequalities. We discuss these goals in the next sections.

Employment

Booth (1995) mentions increasing employment as the first trade union goal. Since most union members depend on gainful employment as their primary source of income, unions generally aim for full employment and for low unemployment. Whereas a high employment rate may be considered a long-term goal, in the short run unions usually aim for employment growth. Therefore, two indicators for the realization of union goals are the employment rate and (annual) percentage employment growth.

In addition, unions tend to differentiate between types of employment and favour permanent contracts, since they offer workers more job and income security than fixed-term or other kinds of flexible employment relations. Therefore, a high share of permanent contracts among the dependent labour force can also be considered an important union goal.

Income

The second trade union goal, according to Booth (1995), is a higher wage. Since employment is the primary income source of most workers, a higher wage means a higher income and, consequently, a higher living standard. Since there may be a negative relationship between the wage level and the employment level, a union will most likely not aim for the highest possible wage but will seek a balance between the wage demand and the (expected) impact on

employment. For example, wage restraint maybe acceptable for a union if it results in more jobs. Nevertheless, unions will generally prefer a higher wage rate over a lower wage rate. The income goal of unions may also be interpreted differently, namely as the objective to appropriate as much of a share of the added value of companies as possible. At the company level this means maximizing the wage bill, a union goal that was already formulated by Dunlop (1958). At the macro-level it implies that unions aim for maximalisation of the wage share of gross domestic product (GDP) (Lansley & Reed, 2013). Actually, this objective refers both to wages and employment, since the wage bill is the product of the wage rate and the employment volume.

The wage is, of course, only one of the many terms of employment that are subject of negotiations between unions and employers or employers' associations. Other terms of employment include working time, holidays, working conditions, training facilities, et cetera. Arguably, wages are the most prominent issue in collective bargaining and certainly tend to attract most media attention. For this reason, because there are fewer comparable data on other terms of employment and to limit the total number of dependent variables, we will restrict ourselves to wages as an indicator for the terms of employment.

Although most union members are workers, a significant proportion of union membership consists of retired workers who are mainly dependent on pensions. In order to achieve an adequate living standard for retirees, increasing the level of pensions is often also an important union goal. The adequacy of pensions is usually measured as the relative level of pension benefits compared to the average wage level, the so-called replacement rate. Raising the replacement rate of pensions – as long as it is significantly lower than 100% – is therefore also one of the union goals with respect to income.

Equality

The third category of trade union goal, according to Boeri et al. (2001, p. 63), refers to the fairness of the distribution of wages. Unions may aim for less inequality of wages as a goal as such, but also because they mainly represent low- and middle-income workers rather than high-income workers (although this may not be true for unions that represent the interests of specific occupational groups, such as pilots or medical specialists).

Since the inequality of the wage distribution can be measured in many ways, it is not a priori clear what the right indicator for wage (in)equality as a union goal is. We will use three commonly used indicators, viz. the ratio between the ninth and the first decile of the wage distribution, the Gini coefficient of the wage distribution and the low-pay incidence. The first

indicator measures the pay gap between the top and the bottom of the wage distribution. The second indicator is a measure of overall wage inequality, taking also into account the distribution of wages in the middle part of the distribution. The third indicator measures the concentration of employment at the bottom of the wage distribution. We assume that unions aim for a reduction of the value of all three indicators.

In addition to overall wage inequality, wages also tend to differ substantially with aspects like age, gender, education, and occupation (Card, Lemieux & Riddell, 2002). Whereas these differences are partly justified on the basis of differences in experience or productivity, unions usually aim to reduce them. This is probably most clearly the case with respect to the gender wage gap, especially when this gap cannot be explained by differences in education or experience but seems to be the result of discrimination. Consequently, reducing the gender wage gap is also an important union goal.

Data & methods

Our approach differs from previous studies, as discussed above, in four respects. First, we follow a purely empirical approach, whereas previous studies are at least partly based on theoretical distinctions or categorizations. We believe that a purely empirical approach is warranted since there is no well-established and generally accepted theory of types of industrial relations systems (comparable, for example, to the theory of welfare regimes that was established by Esping-Andersen), which can form the starting point of our analysis. By following a particular theoretical approach that is suggested in the literature, one runs the risk of a biased analysis which excludes particular aspects or structural relations beforehand. Secondly, as a logical consequence of the previous point, we use a much broader set of indicators for industrial relations systems than previous studies. Since we start from the assumption that it is the industrial relations system *as a whole* that determines the effect on the realization of union goals, there is no reason to limit the analyses to only a few characteristics of collective bargaining, such as centralization and coordination. For example, we also include indicators for national social dialogue, minimum wage setting and the role of works councils. Thirdly, the clustering of countries is based on a statistical hierarchical cluster analysis instead of a qualitative assignment of individual countries to particular categories. Fourthly, we use a broader range of output variables to measure the performance of industrial relations systems than in previous studies. Moreover, these indicators refer primarily to the goals of trade unions, although most can be considered to be goals that enjoy broad public support (perhaps with the exception of overall earnings equality).
In this section, the analytical approach will be presented. First, we discuss the data sources and the methods applied to reduce the large number of variables. Next, we describe the cluster analysis that we performed to construct five clusters of industrial relations systems. Finally, we explain the multilevel analyses that we executed to determine the impact of the industrial relations system of the realization of union goals.

Data sources

Several data sources have been used to collect the data needed to derive the industrial relations clusters and test the hypotheses from the previous sections. First, the variables that represent the characteristics of industrial relations systems are retrieved from the ICTWSS database, version 6.1 (Visser, 2019). This database contains institutional characteristics of wage-setting, social pacts, trade unions, and to a limited extent also some employers'

organisations. Subsequently, the indicators for unions' goals and several control variables were retrieved from various sources. Most of these variables, regarding employment and the economy, were retrieved from the statistical database of the Organisation for Economic Cooperation and Development (OECD), which contains information about 37 OECD member states, including many European countries. In addition, information on the wage share was retrieved from the annual macro-economic database of the European Commission's Directorate General for Economic and Financial Affairs (AMECO). Indicators for migration and pensions were obtained from the Eurostat statistical database, which covers all areas of European society. Lastly, from the World Bank database, indicators regarding the political constellation were retrieved. The sources from which the specific variables were obtained can be found in the appendix.

Sample

The analyses include all European countries with a sufficient amount of data for the period 1990–2018, resulting in a total of 21 countries. The sample consists of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, the Netherlands, Norway, Poland, Portugal, Slovak Republic, Slovenia, Spain, Sweden, Switzerland and the United Kingdom. Combined with a time period of 29 years, this results in a total number of 609 observations.

Missing values

Unfortunately, the data for many institutional characteristics are not available for all years for each country. If we would drop all cases with missing variables, the number of observations would be too strongly reduced to be able to perform multilevel statistical analyses. For this reason, we have imputed missing values through interpolation or extrapolation. First of all, linear interpolation was used to impute missing values between two years for which the value was known. Next, when values at the beginning or the end of the time series were missing and at least two consecutive values following or preceding the missing values were identical, the same values were imputed for the missing values. This procedure was mainly applied to institutional characteristics which are often stable over longer periods of time. For the remaining missing values at the beginning or the end of a series, mostly continuous ones, a linear trend was calculated to extrapolate the observed values backward or forward. When this resulted in theoretically impossible negative values, these were replaced by 0. Lastly, if a

variable was missing for all years for a particular country, the mean value of the particular variable for all other countries was imputed.

Independent variables and factor analyses

In the ICTWSS database almost all variables can be considered to be an indicator for a characteristic of the industrial relations system. Since we want to get an encompassing, 'holistic' view of industrial relations systems we do not focus on specific components of industrial relations but include all categories that are part of the ICTWSS database.[1] These categories are:

1. Wage setting
2. Social pacts
3. Works councils
4. Sectoral institutions and employer organizations
5. Trade unions (number, membership, relation between confederation and affiliates, union concentration and centralisation)

Since the database includes more than 200 different variables, we selected only the main variables in each category and excluded more detailed variables (e.g., duration of collective agreements, specific components of social pacts, number of affiliates of union confederations and union membership rates for specific categories). This resulted in a total number of about 60 variables that we used in our statistical analysis to categorize industrial relations systems. For some variables we combined different potential values if the frequency of particular values was very small.[2] Because the number of variables is very large, we reduced the number to be included in the cluster analysis further by constructing summary scales, based on factor analyses. For each scale, the reliability was checked over the full period from 1990–2018, and additionally for three sub-periods, viz. 1990–1999, 2000–2009, and 2010–2018. For all scales, the reliability over the full period did not differ much from the reliability over the sub-periods. A first round of factor analyses resulted in ten different scales. In a second factor analysis, we used the constructed scales plus the variables that remained separate after the first factor analysis, which led to a reduction of the number of scales to a total of eight. In the next

[1] There is one exception: we did not include the category 'rights of association and collective bargaining', because these rights do not differ substantially between the countries in our sample.
[2] For example, we recoded the number of social pacts that is concluded in a year into a dichotomous variable with the values '0' and '1 or more'.

paragraphs, first, all scales from the first factor analysis will be presented and, next, the scales that resulted from the second factory analysis. Other indicators that are not components of one of the scales but will be used as separate variables in the analyses, will be explained later on in this section.

Table 1 gives an overview of the original eleven scales and the final eight scales that were included in the cluster analysis.

Table 1: Scales for industrial relations systems

Scale	**Indicators**	**Cronbach's Alpha**
Coordination and level of collective bargaining	· Coordination wage-setting	0.912
	· Type coordination wage-setting	
	· Government intervention wage-bargaining	
	· Predominant level wage-bargaining	
	· Combi levels wage bargaining	
Inversed favourability principle and no extensions	· Inversed favourability	0.693
	· Mandatory extension collective agreements ***	
Wage-setting in sectoral agreements and mediation	· Mediation conflicts of rights	0.609
	· Wage-setting sectoral agreements	
	· Mediation conflicts of rights	
Role of unions in collective bargaining and consultation of confederation	· Consultation confederation	0.896
	· Negotiations union wage and non-wage	
	· Negotiations union non-wage	
	· Coordination union wage bargaining enterprise units	
Tripartite council including confederation	· Institutionalised tripartite council	0.697
	· Confederation representing affiliates in council	
	· Power confederation over affiliates	
Tripartite social pacts	· Social pact signed	0.879
	· Scope of social pact	
	· Negotiations social pacts	
Bipartite social pacts and negotiation confederation*		0.686
	Bipartite social pacts**	0.899
	· Nation-wide agreement between unions and employers signed	
	· Autonomously negotiated wage-agreement implemented by unions and employers	
	Negotiation confederation	
	· Confederation negotiates binding national wage–agreement	
	· Confederation negotiates binding national non–wage agreement	
Institutionalised employee representation*		0.774

Sectoral institutions and derogations**	0.579
· Derogation	
· Sectoral organisation of employment relations	
Bipartite council and consultation**	0.683
· Institutionalised bipartite council	
· Routine involvement unions and employers in government decisions	
Works council**	0.842
· Status works councils	
· Representation structure works councils	
· Rights works councils	

* Means the scale was formed by one, or more, other scales.
**Means a constructed scale that became part of another scale.
***Means the indicator was recoded into the other direction before including it in the scale.

The first scale, 'coordination and level of collective bargaining,' is composed of five indicators that refer to both the extent of centralisation and the coordination of wage bargaining. It also includes the (potential) intervention of the government in wage bargaining. Second, the scale 'inversed favourability principle and no extensions' was formed by two indicators. First, the favourability principle refers to hierarchical relationships of agreements in countries characterised by multilevel bargaining where lower-level agreements can only deviate from agreements at the higher-level if they are favourable for the employees (Visser, 2019). The inversed favourability principle indicates that lower-level agreements can also deviate from higher-level agreements if they are more unfavourable for the employees. Second, 'extensions' indicates to what extent collective agreements can be made obligatory for non-organised employers by means of mandatory extension mechanisms. This variable was recoded in the opposite direction in order to match the inversed favourability variable. The third scale, 'wage-setting in sectoral agreements and mediation', combines two variables. The first variable indicates whether collective agreements typically include mediation or arbitration procedures to handle grievances. The second refers to the wage-setting in sectoral agreements, where the value '0' means that the minimum and actual levels (and rates of change) of wages are being defined in sectoral agreements, whereas '2' means that the sectoral agreement set a framework or define the default for enterprise bargaining.
The fourth scale, 'role of unions in collective bargaining and consultation of confederation' was constructed from four variables. These variables indicate whether 'the government routinely consults the confederation on policy issues of an economic or social type', 'the union negotiates regional or national sector-level collective agreements of non-wage and wage terms', 'the union negotiates regional or national sector-level collective agreements of only non-wage terms', and 'the unions coordinate their wage bargaining across enterprise units'. The scale was dichotomized, with a '0' representing a 'no' for all statements and a '1'

representing at least some involvement or consultation of confederations by government decisions, coordination of bargaining of unions between units, or regional or national level agreements by unions.

The fifth scale, 'tripartite council including confederation', consists of three indicators. The first variables indicates whether 'a tripartite institutionalised council concerning economic and social policy in the private sector exists'. The second indicates whether 'affiliates are represented by the confederation in a national social and economic council or similar body'. The third variables indicates whether the confederation has statutory power over its affiliates. It is a sum variable of five separate variables about the confederation's role in veto and ending strikes, collecting dues and reimbursing affiliates, and resistance funds.

The sixth scale, 'tripartite social pacts', includes three indicators. The first two are the statements: 'between governments, employers, unions, or between unions and the government, a tripartite social pact was established in the specific year', and 'the government, the unions or the employers, publicly proposed a social pact and the negotiations take place in the specific year'. The social pacts' scope is a dichotomous indicator, contrasting no pact with a narrow, a broad or a declaratory or symbolic pact.

The seventh scale, 'bipartite social pacts', was created by combining two variables: 'an agreement, nation-wide, between the central trade unions and employers' organisations, is reached and signed in the specific year', and 'the central agreement which includes a settlement on wages is autonomously negotiated by the unions and employers' organisations and implemented'. We recoded the resulting variable into a dichotomous variable with a '0' representing no agreements and '1' representing agreements (i.e., a positive score on either the first or the second statement).

The eighth scale, 'Negotiation confederation', indicates whether the union confederation(s) negotiate(s) binding national agreements on wages and/or other terms of employment.

The ninth scale, 'sectoral institutions and derogations', includes two indicators. First, derogation is defined as the possibility to deviate from statutory norms with the use of collective agreements, which can stipulate less favourable standards than those specified in law (Visser, 2019). Second, the sectoral organisation of employment relations ranges from weak or no sectoral organisations to strong sectoral institutions.

The tenth scale, 'bipartite council and consultation', was also formed by combining two variables: 'an institutionalised bipartite council, including major or central employers' organisations and unions for wage-setting, conflict settlement, and, or, economic forecasting exists', and 'unions and employers have routine involvement in decisions of the government

regarding economic and social policy'.
The eleventh scale, 'works councils' was constructed from three variables. The first one indicates whether the existence of a works council or a similar structure is obligated by law or established through agreements between employers and unions. The second describes the works councils' structure and the third, the rights of the works councils with respect to codetermination.

In the second round of factor analyses, all eleven scales together with the variables that did not fit into a scale were included simultaneously. This resulted in a further reduction of the number of scales, since some original scales could be combined into new scales (see table 1). First, three scales that were constructed in the first round, viz. 'sectoral institutions and derogations', 'bipartite council and consultation', and 'works councils' could be combined into a new scale which we indicate with 'institutionalised employee representation'. Another new scale, called 'bipartite social pacts and negotiations confederation', consists of another scale created in the first round, 'bipartite social pacts', combined with two separate variables that did not fit into a scale before, viz. 'bipartite or tripartite binding cross-sector wage agreements are negotiated by confederation,' and 'binding national cross-sectoral non-wage agreements of a bipartite or tripartite character are negotiated by confederation'. We name the resulting new scale 'bipartite social pacts and negotiations confederation'. The other scales, as described in the previous sections, stayed the same, which means that we ended up with a total number of eight scales.

Individual indicators

A number of variables from the ICTWSS database that were included in the factor analyses did not have a sufficiently high component loading on any of the dimensions to be included in one of the scales that were discussed above. Since each of these variables represents an important characteristic of industrial relations systems on their own, we have included them in the cluster analysis as separate variables in addition to the scales. We describe them in this section. Table 2 lists these variables.

Table 2 Individual indicators for characteristics of industrial relations systems

1. Minimum wage–setting
2. Peace clause
3. Mediation in conflicts of interests
4. Additional company bargaining

5. Articulation of company bargaining
6. Opening clauses
7. Works councils in wage–negotiations
8. Price indexation
9. Confederation coordinating wage–bargaining of affiliates
10. Power union over workplace representatives
11. Centralisation wage–bargaining union
12. Number of employers' confederations
13. Number of union confederation
14. Employers' organisation density
15. Union density
16. Adjusted bargaining coverage

The first variable refers to the minimum wage-setting mechanism. We recoded the original variable in the ICTWSS database into four categories to make it a more or less ordinal indicator for the influence of the government on minimum wage-setting. These categories are 0 (original values 0 and 1), meaning minimum wage-setting in none or only some sectors; 1 (originally 2 and 3), minimum wages set by a national inter-occupational or cross-sectoral agreement between employers and unions, or set by agreements but made binding and extended by law; 2 (originally 4, 5 and 6), a national minimum wage is set by tripartite negotiations, by the government after non-binding tripartite consultations, or by judges or expert committees.; and 3 (originally 7, 8, and 9), a minimum wage is set by the government (either bound by a fixed rule, based on a fixed rule or target, or without a fixed rule).
The second variable, peace clauses, indicates whether collective agreements imply a peace obligation or typically include a peace clause. The third variable indicates whether arbitration or mediation procedures are used in case of conflict of interests.
The next four variables refer to company-level bargaining. The fourth variable measures the reach of additional company bargaining, defined by Visser (2019) as the share of companies and employees simultaneously covered by both industry or cross-industry and company agreements. The fifth variable refers to the articulation of company bargaining and ranges from disarticulated bargaining (which means that additional company wage-bargaining, if it occurs, is conducted by non-union bodies and not answerable by control or under control of the outside union) to articulated bargaining (meaning that additional company-level bargaining on wages is recognised and takes place under the outside union's control). The sixth variable refers to the existence of opening clauses in sectoral collective agreements. The seventh variable indicates whether works councils, or similar structures, play a role in wage negotiations.

The eighth variable indicates whether general price indexation, or cost-of-living clauses are rare or forbidden or are frequently included in collective agreements. The ninth variable indicates whether the confederation coordinates bargaining of affiliates across sectors.
The tenth variable measures the unions' statutory power over their local or workplace representatives. It is a sum indicator of five variables, which provide information about unions' role in veto, collecting dues and reimbursing affiliates, resistance funds, and ending strikes. The eleventh variable measures the centralisation of wage bargaining and is a summary measure of unions' formal authority of sectoral and peak-level wage-setting and unions' concentration at the sectoral and peak level.
Finally, there are five cardinal variables that do not measure formal institutions but the actual functioning of the industrial relations system. The twelfth and thirteenth variable are counts of the number of employers' confederations (excluding agriculture) and union confederations, respectively. The fourteenth and fifteenth variables measure the density (relative size) of the membership of employers' organizations and of trade unions. Employers' organization density is measured as the share of employees that are employed by a company that is a member of an employers' organization whereas union density measures the share of employees that are member of a trade union.
Lastly, the sixteenth variable is the adjusted bargaining or union coverage rate which is defined as the proportion of employees who are covered by valid collective wage bargaining agreements, with adjustment for the possibility that some occupations or sectors are excluded from the bargaining rights (Visser, 2019).
It is important to stress once more that these 16 variables could not be included in one of the scales discussed before and therefore are included as separate variables in the cluster analysis.

Dependent variables

The dependent variables in this study, all continuous ones and measured annually, measure the realization of a number of important trade union goals. As discussed above, we distinguish three broad categories of union goals, viz. employment, income and (in)equality.
The employment goals of unions are, first of all, measured by the employment rate, that is the share of employed people, aged 15–64, as a percentage of all people in this age category. The second indicator for this goal is the unemployment rate, measured as the number of unemployed people as a percentage of the labour force, aged 15–64 (of course, in this case a lower value means better performance on the union goal). Thirdly, the share of permanent

employment is measured as the share of all employees with a permanent employment contract. Lastly, employment growth was measured as the annual percentage growth of total employment.

Regarding the income goal, three indicators were used. First, the annual percentage increase of hourly earnings in the private sector. The second variable is the adjusted wage share, measured as the total compensation of employees as a percentage of GDP at market prices. Lastly, a variable indicates the adequacy of pensions by measuring the aggregate replacement rate. This was measured as the ratio of the median individual gross pensions of the 65–74 age category, relative to the median individual gross earnings of the 50–59 age category, with other social benefits excluded.

Finally, regarding equality as a trade union goal, four indicators were used. Firstly, the decile ratio of gross earnings is used to measure overall earnings inequality. It is equal to the ratio of the ninth and the first decile of earnings (D9 /D1). Secondly, another indicator for overall wage inequality is the Gini coefficient of market income.[3] This measures inequality of income before transfers and taxes, ranging from 0–1. However, for Greece and Hungary, the data refer to the income after transfers and taxes. Thirdly, low pay incidence is measured as the percentage of employees earning less than two-thirds of all full-time workers' gross median earnings. Lastly, the unadjusted gender wage gap was measured as the percentage difference between men's and women's median wages relative to men's median wages.

Control variables

In the multilevel analyses of the effects of the industrial relations clusters on the realization of union goals, we will also use a number of control variables, to reduce the risk that the associations we find are spurious. We use a range of economic, demographic and political variables. The first control variable is the youth dependency ratio, representing the population under 20 years as a percentage of the population aged 20–64. Second, the old dependency ratio is calculated as the population aged 65 and over as a percentage of the population aged 20–64. The third control variable is the percentage of self-employed people as a share of the total employed population. The next control variable is price inflation, measured with the consumer price index (CPI). GDP growth is measured as the annual percentage growth of GDP per capita at constant prices. The fifth control variable is the percentage of females in

[3] This category also includes non–labour incomes, such as returns on capital and the entrepreneurial income of self–employed. Data on the Gini coefficient of gross wages are not available.

employment as part of total employment. The sixth variable is the share of immigrants in the total population.

For the economic structure two variables were constructed that measure the share of agriculture and manufacturing, and the share of commercial services, respectively, in total employment. Commercial services include wholesale and retail trade, repair of motor vehicles and motorcycles, transportation and storage, accommodation and food service activities, information and communication, financial and insurance activities, real estate activities, professional, scientific and technical activities, administrative and support service activities.

The last control variable represents the political structure and is obtained from three indicators. These indicators are the political orientation of the first, the second, and the third–largest government party, measured as 'right', 'left', 'centre', or 'not applicable'. By scoring right as '–1', centre or not applicable as '0', and left as '1' and by multiplying the score of the largest government party by 3, the second-largest by 2, and the third-largest government party by 1, and then adding them up a total score for the political orientation of the government was calculated.

Cluster analysis

The cluster analysis was performed with the hierarchical cluster function of SPSS using squared Euclidean distance as a measure for the distance between cases and Ward's clustering method. Since clustering is sensitive to the absolute size of the values of the variables, first, all independent variables and scales, as explained above, were rescaled into a 0–100 variable, where 0 represents the minimum observed value and 100 the maximum observed value. If we add all the variables in this form in the cluster analysis, they all get the same weight.

However, based on previous studies of industrial relations systems, it is plausible that some scales or variables are more important than others in characterizing an industrial relations system. Therefore, some were given more or less weight. The scale 'coordination and level of collective bargaining' was multiplied by two, because it represents some of the key pillars in studies of industrial relations (OECD, 2019c). In contrast, the scales 'favourability principle and no extensions' and 'wage-setting in sectoral agreements and mediation' were multiplied by 0.5.

The individual variables about mediation, opening clauses, additional company bargaining, works councils in wage negotiations, coordination bargaining confederation, union power over representatives, and articulation of enterprise bargaining were multiplied by 0.5. On the

other hand, employers' density, union density, and bargaining coverage rate were multiplied by 2. The other variables and scales got a weight of 1.

There is no theoretically optimal number of clusters as the outcome of a cluster analysis. In general, one has to seek a balance between the homogeneity of the clusters and the number of clusters. The smaller the number of clusters (with a minimum of three or four), the sparser the model and the more useful the clustering, but also the more heterogeneous the clusters become. Moreover, a clustering in which the clusters are of more or less equal size is preferable to a clustering that is dominated by one or two big clusters, whereas the remaining clusters are relatively small. Based on these criteria we selected a solution with five clusters and a relatively equal distribution of cases between these clusters. One should also take into account that a cluster is usually not an isolated group with a sharp borderline that separates it from other clusters. The dividing lines between clusters are always to some extent arbitrary and other groupings of cases might also be possible.

Multilevel analyses

After the cluster analysis, we used multilevel regression analyses to investigate the effects of the membership of a particular cluster on the realization of the union goals. We use multilevel analysis because the annual observations are nested within countries, it is plausible that these annual observations are correlated over time and that there are time-invariant country-specific differences that are not captured by the control variables. Therefore, a fixed variables mixed model with time variation was used to carry out the multilevel analyses. For each dependent variable, we applied three models. First, we estimated an empty model in which only the five country clusters were included. In the second model we added the control variables to the clusters. Based on these two models, we constructed a ranking of the best scoring clusters on each of the union goals. In the third model we add the individual variables and scales that were used for the cluster analysis in addition to the clusters. With this model we can test whether the clusters add explanatory power to an analysis which only includes the separate indicators for the industrial relations system. If the effects of the clusters are still significant after including the separate indicators, this indicates that, due to complementarities, the system as a whole matters.

Robustness checks

Our cluster analysis results in a clustering in which Spain is allocated to the same cluster as Austria and the Netherlands. Since this result is at odds with previous studies of types or clusters of industrial relations systems (e.g., OECD, 2018b), we checked whether the analyses are robust concerning the country clustering. In this robustness check Spain is excluded from the cluster with the Netherlands and Austria, and used as a separate category. The primary analyses will be compared with this alternative clustering and differences between Spain and the cluster of Austria and the Netherlands regarding the performance on union goals will be explored.

Cluster analysis

The hierarchical cluster analysis of twenty countries for the period 1990-2018 resulted in five clusters (Table 3). First of all, it is interesting to note that seventeen of the 21 countries belonged to the same cluster for the whole period of 29 years. This demonstrates that industrial relations systems are relatively stable and that the differences between countries tend to be more or less constant over time. Four countries switched from cluster 3 to cluster 4 at a particular point of time. The Czech Republic and the Slovak Republic moved from the 'corporatist' cluster 3 to the more 'liberal' cluster 4 shortly after the breakup of Czechoslovakia. Greece and Ireland made the same move about fifteen years later, when both countries went through a deep recession in the aftermath of the credit crunch of 2007.

Table 3. Composition of five country clusters of industrial relations systems (1990–2018)

cluster 1	cluster 2	cluster 3	cluster 4	cluster 5
Austria	Belgium	Germany	Hungary	France
Netherlands	Denmark	Switzerland	Poland	Italy
Spain	Finland	Greece (1990–2010)	Greece (2011–2018)	Portugal
	Norway	Ireland (1990–2008)	Ireland (2009–2018)	Slovenia
	Sweden	Czechoslovakia (1990–1992)	United Kingdom	
		Czech Republic (1993–1994) Slovak Republic (1993–1996, 1999–2000)	Czech Republic (1995–2018) Slovak Republic (1997–1998, 2001–2018)	

Table 4 gives an overview of the average score of each cluster on the 24 scales and variables that were used in the cluster analysis. A + sign means that the average score of a cluster is at least a third higher than the average score for all countries; a – sign means that the cluster score is at least a third lower than the average score. The remaining scores are indicated by a 0. In the appendix a table with the average values per cluster is included.

Table 4. Average score of clusters on industrial relations characteristics

cluster	1	2	3	4	5
Bargaining coverage	0	0	0	–	0
Coordination and level	0	+	0	–	0
Centralisation of CB	+	+	0	–	–
Coordination of bargaining by confederation	+	+	0	–	0
Inversed favourability principle and no extensions	0	0	0	+	–
Flexibility of wage-setting and mediation	0	+	0	–	–
Institutionalized employee representation	+	+	0	–	0
Works council in wage negotiation	+	–	0	0	+
Additional enterprise bargaining	–	+	0	0	0
Articulation enterprise bargaining	+	–	0	0	+
Opening clauses	+	–	+	–	0
Mediation	–	0	0	0	–
Peace clauses in CA	+	0	0	0	–
Price indexation	+	+	–	0	–
Minimum wage-setting	+	–	–	+	+
Tripartite council including confederation	+	0	–	0	0
Tripartite social pacts	0	0	0	–	+
Bipartite social pacts and negotiations confederation	0	0	0	–	+
Role of unions in CB and consult confederation	0	0	0	0	0
Power of union over representatives	0	+	0	0	–
Union density	0	+	0	0	0
Employers' organisation density	+	0	0	–	0
Number of employers' organisations	–	0	0	0	+
Number of union confederations	0	0	–	0	+

+ > 133% of average score; – < 67% of average score; 0 from 67% to 133% of average score

The first country cluster includes Austria, the Netherlands, and Spain. Although the dominant level of collective bargaining in this cluster is the sectoral level, it distinguishes itself from the other clusters by a strong institutionalized employee representation through formal bipartite councils or consultation by the government or a strong position of works councils, absence of additional bargaining at the company level, but a role of works councils in wage bargaining, partial or full articulation of enterprise bargaining (i.e. under control of the union or the works council), the inclusion of peace clauses and opening clauses in collective agreements, the common use of price indexation, and furthermore a strong role of the government in minimum wage-setting, a relatively high degree of centralisation of bargaining and a high employers' organisation density in combination with a small number of employers' organisations. Moreover, mediation is largely absent. If one would try to characterize this cluster in a few words, it could be named a *multilevel industrial relations system*.

The second cluster is formed by Belgium, Denmark, Finland, Norway and Sweden. Distinguishing features of this cluster are the high level of centralization and coordination, flexibility of wage-setting and mediation, a highly institutionalized employee representation, room for additional enterprise bargaining, but the absence of works councils in wage bargaining, no articulation of company bargaining and no use of opening clauses, the use of price indexation, a small role of the government in minimum wage-setting, a strong power of unions over their representatives and a high union density. This cluster might be characterized as a *centralised industrial relations system*.

The countries included in the third cluster are Germany, Switzerland, and for the first part of the period Czechoslovakia (1990-1992), the Czech Republic (1993–1994), Greece (1990–2010), Ireland (1990–2008), and the Slovak Republic (1993–1996, 1999–2000). On most indicators this is a rather 'average' cluster. Typical for this cluster are the frequent use of opening clauses, the absence of price indexation, the limited role of the government in minimum wage-setting, the absence of a tripartite council and the small number of union confederations. This third cluster could be named a *bipartite industrial relations system*.

The fourth cluster consists of Hungary, Poland, the United Kingdom, and for more recent years the Czech Republic (1995–2018), Greece (2011–2018), Ireland (2009–2018), and the Slovak Republic (1997, 1998, 2001–2018). It is characterized by a rather liberalized bargaining system, with low bargaining coverage, mainly company-level bargaining (decentralised) without coordination by the union confederation(s), strong inversed favourability and no extension, absence of sector-level bargaining and mediation procedures, little institutionalized employee representation, little use of opening clauses (because they are not needed), absence of (bipartite or tripartite) social pacts, and low employers' density. This cluster might be called a *decentralized industrial relations system*.

Lastly, the fifth cluster includes France, Italy, Portugal, and Slovenia. This cluster is characterized by decentralized bargaining, a small role for favourability and flexibility (because they are not needed), a strong role of unions in wage bargaining and articulation of enterprise bargaining, little use of mediation, peace clauses and price indexation, a strong role of the government in minimum wage-setting, many bipartite and tripartite social pacts. Furthermore, there is little power of unions over representatives, and a large number of employers' organisations and union confederations. We might call this a *polarized industrial relations system*, since it combines company-level bargaining with national social pacts and a strong role of the government.

If we compare our clustering of countries with previous categorizations, then we note both some similarities and a few noticeable differences. To start with the similarities: the combination of Nordic countries (Denmark, Norway, Sweden and Finland) in one cluster, the combination of Latin countries (France, Italy, Spain, Portugal) and the combination of Central and Eastern European (CEE) countries (Hungary, Poland, Czechia and Slovakia) are not uncommon. With a few differences, we find similar clusters in Visser (2008) and the OECD (2019c). Our clustering differs from previous studies mainly with respect to the continental and Anglo-Saxon countries and with respect to Belgium and Spain. In our analysis, the UK falls in the same cluster as the CEE countries. This is similar to OECD (2019c) but differs from Visser (2008) who distinguishes a separate group of the UK and Ireland. The position of Ireland is also somewhat ambivalent, although our classification of Ireland for the period since 2006 in the CEE-UK-cluster coincides with the clustering of the OECD (2019c). Our classification of Belgium together with the Nordic countries differs from Visser (2008), but OECD (2019c) also combines Belgium with a Nordic country, viz. Finland. The main difference with the other studies is that we distinguish two 'continental' clusters, one with Austria, the Netherlands and Spain, the other with Germany, Switzerland and, for the earlier years, Czechia, Slovakia, Greece and Ireland. Most surprising is perhaps that we assign Spain to the same cluster as Austria and the Netherlands, whereas Visser (2008) and OECD (2019c) assign Spain to the Latin cluster. The main aspects in which Spain differs significantly from the other Latin countries and is more similar to Austria and the Netherlands are the use of opening clauses, peace clauses and price indexation in collective agreements. Since these aspects were not taken into account in the clustering of Visser (2008) and OECD (2019c) this explains why they did not note the similarity with Austria and the Netherlands.

The categorization of Czechia, Slovakia, Greece and Ireland in our clustering is less clear, since these four countries switched clusters at some point in time between 1990 and 2018. A closer look shows that the scores of these switching countries on various indicators changed substantially around the time they switched. All four countries experienced significant decreases in coordination of bargaining, whereas the inversed favourability principle, flexibility of wage-setting, the role of works councils in wage bargaining and the use of opening clauses increased. Moreover, the number of (bipartite or tripartite) social pacts decreased. All these changes point to a substantial liberalization and decentralization of collective bargaining. With respect to Czechia and Slovakia these changes seem to be related to the transition period after the fall of communism, whereas the changes in Greece and

Ireland may be related to the Eurocrisis and the austerity policies, enforced by the so-called Troika, during the deep recession of 2009-2013.

Taken the literature and country clusters into account, there is the expectation that cluster 2, with Belgium and the Nordic countries included will perform overall best on the trade union goals. In the studies using country clustering to compare specific outcomes, the Nordic countries were often appointed to the same cluster. Besides, clusters with the Nordic countries included often seem to perform as one of the best on employment and unemployment (Calmfors & Driffill, 1988; OECD, 2018b; OECD, 2019c). However, besides these country comparative studies, Nordic countries also seem to perform well on equality indicators, such as the incidence of the gender wage gap, low pay and the decile ratios of gross earnings (OECD, 2020b; OECD, 2020c; OECD, 2018b). Besides, regarding specific indicators for unions and employers' organisations' presence, like the density rates, the Nordic countries also seem to perform well (OECD, 2019c). Thus, based on the literature and the country clusters resulting from the cluster analysis, we can formulate the hypothesis that cluster 2 will perform the best with respect to the trade union goals.

Results

In the following sections we present the results, per category of trade union goals, by showing the estimated effects and their significance of the country clusters, both in the empty multilevel models and the ones with control variables included. In the next section we will examine whether the clusters add explanatory power to the individual indicators of the industrial relations system. Lastly, robustness checks will be performed with respect to the inclusion of Spain in the same cluster as Austria and the Netherlands.

Employment

First of all, the outcomes of the empty models, in which only the cluster is included as an explanatory variable, with respect to the employment indicators are presented (table 5). In each table we take cluster 1 (with Austria, the Netherlands and Spain) as the reference category. The countries in cluster 1 had an average employment rate of 67.51% over the period 1990-2018. The employment rate in cluster 2 was, on average, 3.11 percentage points higher. The employment rate of cluster 3 did not differ significantly from cluster 1, whereas cluster 4 and cluster 5 had a substantially lower employment rate. The results for the unemployment rate are roughly similar: cluster 2 scored best and cluster 4 scored worst, although only the unemployment rate of cluster 4 differs significantly from cluster 1.
With respect to the share of permanent employment, cluster 1 scored the worst with an average share of 82.25%. In all other clusters the share of permanent employment was significantly higher, most of all in clusters 3 and 4, where the share of permanent employment is close to 90%.
Cluster 1 scored the best, however, with respect to employment growth. In the period 1990-2018 employment in this cluster increased on average by 1.56% annually. Employment growth in cluster 2 and 5 was significantly lower. Although employment growth in cluster 3 and 4 was also lower than in cluster 1, the difference is not significant.

Table 5: Multilevel regression employment indicators (empty model)

	Employment rate	Unemployment rate	Permanent employment	Employment growth
Cluster 1 (=ref.)	67.51	7.15	82.25	1.56
Difference:				
Cluster 2	3.11*	–0.85	5.77*	-0.58*
Cluster 3	0.06	0.61	7.12*	-0.29
Cluster 4	–6.00*	2.69*	7.20*	-0.36
Cluster 5	–4.61*	0.65	2.73*	-0.81*

*Significant: p–value ≤ .05.

Table 6 shows the results of the model with control variables. These results differ in some respects from the empty model. Nevertheless, many differences between the clusters are still significant, which indicates that the differences in employment performance cannot be (fully) explained by other factors that differ between the countries. The industrial relations system does indeed matter for performance.

With respect to the employment rate, cluster 3 performs the best now, although not significantly better than cluster 1. After controlling for other variables, cluster 2 is no longer the best performer, but has a significantly lower employment rate than clusters 1 and 3. Clusters 4 and 5 still have the lowest employment rate, although the difference with cluster 1 is somewhat reduced after including the control variables.

Cluster 3 and, remarkably, cluster 5 now perform best with respect to the unemployment rate: both have a significantly lower unemployment rate than the other three clusters, which do not differ significantly from each other.

Regarding the share of permanent employment, cluster 4 now takes the first place, followed by cluster 3, and cluster 1 still performs worst. Cluster 1 still has the highest employment growth rate, although only cluster 3 performs significantly worse.

Table 6: Multilevel regression employment indicators (with control variables)

	Employment rate	**Unemployment rate**	**Permanent employment**	**Employment growth**
Cluster 1 (=ref.)	-	-	-	-
Cluster 2	–1.48*	–1.31*	5.64*	-0.38
Cluster 3	1.45	–0.44	6.96*	-0.65*
Cluster 4	–2.91*	0.19	10.52*	-0.25
Cluster 5	–2.24*	–2.43*	5.73*	-0.16

*Significant: p–value ≤ .05.

Income

The next category of trade union goals refers to income. Table 7 shows the results for the empty model. Average annual growth of gross earnings was the highest in cluster 4 with 3.15% (1.55 + 1.60). Earnings growth did not differ significantly between the other clusters. The wage share in GDP is the highest in clusters 1 and 5 with around 57%, and the lowest in cluster 4 with about 49%. Clusters 2 and 3 score in-between, but significantly lower than cluster 1.

The replacement rate of pensions is the highest in cluster 4, viz. 53% (50.66 + 2.41), slightly more than in cluster 5. Cluster 3 has the lowest pensions, 10 percentage points lower than in cluster 4.

Table 7: Multilevel regression income indicators (empty model)

	Earnings growth	Wage share	Replacement rate
Cluster 1 (= ref.)	1.55	56.76	50.66
Difference:			
Cluster 2	0.34	–2.00*	-2.71*
Cluster 3	-0.23	–3.87*	-7.78*
Cluster 4	1.60*	–7.65*	2.41*
Cluster 5	-0.21	0.33	2.09

*Significant at a p–value ≤ .05.

These results are roughly replicated after we control for the impact of other explanatory variables (table 8). Earnings growth is still the highest in cluster 4, but now it is significantly lower in clusters 3 and 5 compared to clusters 1 and 2. The ranking with respect to the wage share is the same as in the empty model. The results with respect to the replacement rate of pensions do, however, change in some respects. After including the control variables, the replacement rate is highest in cluster 1 and significantly lower in all other clusters. Cluster 3 still has the lowest replacement rate.

Table 8: Multilevel regression income indicators (with control variables)

	Earnings growth	Wage share	Replacement rate
Cluster 1 (= ref.)	0	0	0
Cluster 2	-0.26	–3.37*	-7.89*
Cluster 3	-0.96*	–3.47*	-12.41*
Cluster 4	0.80*	–6.00*	-5.20*
Cluster 5	-1.30*	0.14	-6.38*

*Significant at a p–value ≤ .05.

Equality

The last category of union goals that we explore refers to equality. In table 9 we present the results of the empty model. Since the value of all indicators increases with increasing inequality, the clusters with the lowest values score best. Regarding the low pay incidence indicator, cluster 2 is the top-performer, with a share of low pay employment of around 10% (14.38 – 4.20). Clusters 1 and 5 follow with a low pay incidence of just over 14%, whereas in cluster 3 more than 17% and in cluster 4 almost 20% of employment is low paid.
Cluster 5 performs best with respect to the gender wage gap, although it is still more than 11%. Cluster 2 performs only slightly worse, but the other clusters follow at a substantial distance. In cluster 3 the average gender wage gap is 20%.

With respect to the inequality of gross earnings, cluster 2 has the smallest gap between the ninth and the first decile: a ratio of 2.32 (3.12 – 0.80). Cluster 5 has the largest decile ratio: 3.65 (3.12 + 0.53).

Finally, the Gini coefficient of market income does not differ significantly between clusters 1, 2 and 3 but is significantly higher in clusters 4 and 5.

Table 9: Multilevel regression inequality indicators (empty model)

	Low pay incidence	Gender wage gap	Decile ratios of gross earnings	Gini market income
Cluster 1 (= ref.)	14.38	18.19	3.12	0.451
Difference:				
Cluster 2	–4.20*	–5.31*	–0.80*	–0.010
Cluster 3	2.78*	1.81*	0.03	0.010
Cluster 4	5.38*	–2.36*	0.53*	0.043*
Cluster 5	0.09	–6.53*	0.15*	0.030*

*Significant at a p–value ≤ .05.

Once more, after controlling for the effect of other variables, some results change, in particular with respect to the last two indicators (table 10). The ranking of clusters with respect to low pay incidence and the gender wage gap remains the same and most differences are still significant. Clusters 2 and 4 are still the best, respectively the worst performers regarding the decile ratio, but clusters 3 and 5 have now a significantly smaller decile ratio than cluster 1. Regarding the inequality of market incomes, clusters 2 and 3 now significantly outperform cluster 1, whereas cluster 4 is still the most unequal.

Table 10: Multilevel regression inequality indicators (with control variables)

	Low pay incidence	Gender wage gap	Decile ratios of gross earnings	Gini market income
Cluster 1 (=ref.)	0	0	0	0
Cluster 2	–5.21*	–7.29*	–0.94*	–0.022*
Cluster 3	1.86*	1.34	–0.12*	–0.019*
Cluster 4	4.13*	–3.08*	0.12*	0.018*
Cluster 5	–0.29	–6.65*	–0.24*	0.011

*Significant: p–value ≤ .05.

Overview of the results

Table 11 gives an overview of the ranking of the five clusters on each of the eleven indicators. To ease the interpretation, the cells in the table have been coloured, ranging from green for the best scoring countries to red for the worst performers. It is immediately clear from this table that no cluster scores uniformly better or worse than the other clusters. Each cluster belongs to the best performing clusters on some indicators and to the worst performing

clusters on other indicators. Only cluster 2 never scores worst, whereas cluster 3 never scores best in the empty model.

Cluster 1 (Austria, the Netherlands, and Spain) scores best on employment growth and, if control variables are included, on the replacement rate of pensions. In the full model it also scores relatively well on the employment rate, earnings growth and the wage share. However, cluster 1 scores worst on the share of permanent employment and, in the full model, second worst on the unemployment rate, the gender wage gap and the 9/1 decile ratio.

Cluster 2 (Belgium, Denmark, Finland, Norway and Sweden) scores the best on all inequality indicators, if control variables are included. As mentioned, this cluster scores the worst on none of the indicators, but it scores second worst on the share of permanent employment, employment growth and the replacement rate.

Cluster 3 (Germany, Switzerland and, for the first years also Czechia, Slovakia, Greece and Ireland) scores best on the employment rate when the control variables are taken into account. However, the cluster scores worst (in the full model) on employment growth, the replacement rate and the gender wage gap, and also relatively badly on earnings growth, the wage share and low pay incidence.

Cluster 4 (Hungary, Poland, the UK and for later years Czechia, Slovakia, Greece and Ireland) performs best on the share of permanent employment and earnings growth. But in the full model it scores worst on six out of eleven indicators: employment rate, unemployment rate, wage share, low pay incidence, decile ration and Gini coefficient.

Finally, cluster 5 (France, Italy, Portugal and Slovenia) scores best, in the full model, on the unemployment rate and the wage share. It also scores relatively well on employment growth, low pay incidence, gender wage gap and decile ratio. However, it scores worst on earnings growth.

Table 11. Ranking of the country clusters with respect to the effect on the union goals in the empty models and the full models with control variables

	Employment				Income			Inequality			
Empty models	Employment rate	Unemployment rate	Permanent employent	Employment growth	Earnings growth	Wage share	Replacement rate	Low pay incidence	Gender wage gap	Decile ratio gross earnings	Gini market income
Cluster 1	3	2	5	1	3	2	3	2	4	2	2
Cluster 2	1	1	3	4	2	3	4	1	2	1	1
Cluster 3	2	3	2	2	5	4	5	4	5	3	3
Cluster 4	5	5	1	3	1	5	1	5	3	5	5
Cluster 5	4	4	4	5	4	1	2	3	1	4	4
Full models											
Cluster 1	2	4	5	1	2	2	1	3	4	4	3
Cluster 2	3	2	4	4	3	3	4	1	1	1	1
Cluster 3	1	3	2	5	4	4	5	4	5	3	2
Cluster 4	5	5	1	3	1	5	2	5	3	5	5
Cluster 5	4	1	3	2	5	1	3	2	2	2	4

Does the industrial relations system explain more than its components?

The reason for estimating the effect of clusters of industrial relations systems on the performance with respect to a number of union goals is that it is the type of industrial relations system *as a whole* instead of a set of separate indicators that determines the performance of the system. If complementarities exist between the different components of the industrial relations system, the effect of the system as a whole is not simply the sum of the effects of the separate components. We test this assumption in the following way. First, we performed regression analyses of the union goals in which only the separate indicators of the industrial relations system were included. Next, we conducted a second series of regression analyses of the residuals of the first set of regressions with only the clusters as explanatory variables. Since the residuals represent the variation in the performance on the union goals that cannot be explained by the separate indicators, a significant effect of one or more clusters on these residuals represents the *additional* effect of clusters on top of the effect of the constituent indicators. This is a very strong test of the added value of the clusters, since it assumes that the clusters only have an effect after the effect of all separate indicators has been taken into account. Moreover, we can only estimate the effects of clusters compared to the effect of a reference cluster (cluster 1). This means that we estimate whether the clusters have *different* effects, but not whether there is a joint effect of the systems of industrial relations.

Table 12. Significant effects (90%) of the clusters on the residuals of the regression with the separate indicators for industrial relations

	ER	UR	PE	EG	EaG	WS	RR	DR	G	LP	GW
cluster 1 (ref.)											
cluster 2						0.71	-1.30				0.75
cluster 3				-1.14		0.98					
cluster 4			-0.83			0.63	-1.90	0.09			
cluster 5							-2.00				

Note. ER = employment rate; UR= unemployment rate; PE = permanent employment; EG = Employment growth; EaG = earnings growth; WS = wage share; RR = replacement rate; DR = decile ratio; G = gini market incomes; LP = low pay incidence; GW = gender wage gap

Table 12 shows the significant effects (at 90%) of the clusters (compared to cluster 1) on the various union goals. Although most of the potential 44 effects (11 x 4) are not significant, we

nevertheless find 10 significant effects, that lend support to the hypothesis that an industrial relations system as a whole has an additional effect on top of the effects of the separate indicators. The wage share and the replacement rate of pensions in particular show a number of significant effects of the clusters. Clusters 2, 3 and 4 have a significantly larger wage share compared to clusters 1 and 5 than can be explained by the constituent elements of these clusters. Clusters 2, 4 and 5 have a significantly lower replacement rate of pensions compared to clusters 1 and 3 than can be explained by the separate indicators. Furthermore, cluster 4 has a lower share of permanent employment and a higher decile ratio, cluster 3 has a lower rate of earnings growth and cluster 2 a larger gender wage gap than the other clusters.
We conclude therefore that our hypothesis that the industrial system as a whole matters is corroborated by our analyses.

Robustness check

The inclusion of Spain in one cluster with Austria and the Netherlands is perhaps the most unexpected result of our cluster analysis, since these countries are not usually grouped together. To test whether our results on the performance of the clusters strongly depend on this clustering, we performed a robustness check by performing a regression analysis in which Spain was excluded from cluster 1 and included as a separate 'one-country cluster'. The results can be found in the appendix. Table 12 shows the rankings of the adjusted clusters in the full model (including control variables), where cluster 1a refers to Austria and the Netherlands, and Spain is analysed separately.
First, the rankings of cluster 1a and Spain differ a lot with respect to three of the four employment indicators. Whereas Austria and the Netherlands now score the best on the employment rate and the unemployment rate, Spain scores worst. However, with respect to employment growth, Spain scores best, whereas Austria and the Netherlands score quite average. Regarding the share of permanent employment both cluster 1a and Spain are still the worst performing clusters.
Secondly, with respect to the income and inequality indicators, the differences in ranking between Austria and the Netherlands on the one hand and Spain on the other hand are much smaller. For five of the seven indicators, Spain immediately follows after or precedes Austria and the Netherlands. For two indicators, viz. the wage share and the decile ratio, there is another cluster in-between cluster 1a and Spain, but nevertheless the difference between cluster 1a and Spain is relatively small.

Overall, we conclude from the robustness check that only regarding the employment rate, the unemployment rate and employment growth the outcomes change significantly if we separate Spain from Austria and the Netherlands. With respect to the other nine indicators, the differences in outcomes are relatively small. In most cases, Spain immediately follows or precedes the Dutch and Austrian cluster in the ranking. Therefore, we conclude that, apart from three employment indicators, the analyses are quite robust concerning the country clustering.

Table 12. Ranking of the country clusters with respect to the effect on the union goals when Spain is excluded from cluster 1 in the full models with control variables

	Employment				Income			Inequality			
Full models	Employment rate	Unemployment rate	Permanent employent	Employment growth	Earnings growth	Wage share	Replacement rate	Low pay incidence	Gender wage gap	Decile ratio gross earnings	Gini market income
Cluster 1a	1	1	5	4	3	3	1	3	5	4	3
Spain	6	6	6	1	2	1	2	4	4	6	4
Cluster 2	3	3	2	5	4	5	5	1	1	1	1
Cluster 3	2	4	3	6	5	4	6	5	6	3	2
Cluster 4	5	5	1	3	1	6	3	6	3	5	6
Cluster 5	4	2	4	2	6	2	4	2	2	2	5

Conclusion & discussion

This study examined the influence of the system of industrial relations on the performance of countries with respect to three trade union goals: employment, income, and equality. In order to assess this influence, a quantitative comparative country study including the construction of country clusters was performed. Firstly, this study expanded on the existing literature by including specific union indicators to measure the trade union goals that go beyond the widely used socio-economic indicators such as employment and unemployment rates (Calmfors & Driffill, 1988). Second, this study based the country clustering on a larger set of industrial relations indicators than previous studies to capture the complexity of such a system. Whereas previous studies often focused only on centralisation and coordination of collective bargaining (Calmfors & Driffill, 1988; Calmfors, 1993; Soskice, 1990; Traxler, Blaschke, & Kittel, 2001), this study also includes specific union and employers' organisation indicators such as density rates and their concentration or fragmentation and the role of works councils. Third, this study based the country clustering on a statistical analysis instead of a qualitative assessment, although the choice of the optimal number of clusters is still a qualitative and to some extent subjective element in our analysis.
Based on a cluster analysis for 21 European countries over the period 1990-2018, we found a clustering that shares similarities but also has some notable differences with previous categorizations. The most remarkable outcome of the cluster analysis is that Austria and the Netherlands are assigned to the same cluster as Spain. In line with previous studies, we found that Denmark, Finland, Norway and Sweden form a separate cluster, together with Belgium. Germany and Switzerland make up the core of the third cluster, but for part of the period also Czechoslovakia (and later on Czechia and Slovakia), Greece and Ireland belonged to this cluster. The fourth cluster mainly consists of Eastern European countries (Hungary, Poland and Czechia and Slovakia in later years) and the UK, and for later years also Ireland. The fifth cluster is composed of France, Italy, Portugal and Slovenia.

Based on a number of multilevel analyses, the following conclusions can be drawn about the effect of the industrial relations cluster on the attainment of a number of trade union goals. First, this study demonstrated significant differences in country clusters' trade union goal performance. This is in line with earlier results in the literature, which showed that country clusters differ much in socio-economic outcomes (Calmfors & Driffill, 1988; OECD, 2018b;

OECD, 2019c; Braakmann & Brandl, 2016). While the country clusters in this study did not show significant differences with the reference cluster on all outcome indicators, each cluster showed significant differences on at least some of the indicators. Therefore, we can conclude that the type of industrial relations system and the embeddedness of trade unions do indeed matter for trade union goal performance.

Second, this study shows that there is not one country cluster that scores unambiguously the best on all three trade union goals. If we include control variables in our analyses, cluster 1 (Austria, the Netherlands, Spain) scores the best on employment growth and the replacement rate of pensions. Cluster 2 (Belgium, Denmark, Finland, Norway, Sweden) is the best performing cluster with respect to the four equality indicators (low pay incidence, gender wage gap, 9/1 decile ratio of earnings and Gini coefficient of market incomes). Cluster 3 (Germany, Switzerland, and partly the Czech Republic, Greece, Ireland, and the Slovak Republic) performs best with respect to the employment rate. Cluster 4 (Hungary, Poland, and the UK, and Czechia, Slovakia and Ireland in later years) is the best performer with respect to the share of permanent employment and earnings growth. Finally, cluster 5 (France, Italy, Portugal, Slovenia) is the best performer on unemployment and the wage share. While the literature often referred to the Nordic countries (our cluster 2) as top performers regarding both equality and employment (Calmfors & Driffill, 1988; OECD, 2018b; OECD, 2019c; OECD, 2020b; OECD, 2020c), we find that they only perform best with respect to equality, whereas they are outperformed by other clusters with respect to the employment goals. Since it is not clear a priori which union goals should get the highest priority, we cannot draw a firm conclusion on the 'best' system of industrial relations from the point of view of trade unions.

The fourth conclusion that can be drawn is that the clusters of industrial relations systems do indeed add explanatory power to the individual indicators, because the clusters also have a number of statistically significant effects on the residuals of a set of regression analyses that only include the separate indicators of the industrial relations systems. This is in line with the literature, in which authors argue the importance of treating the systems as a whole and not as sets of separate indicators (OECD, 2019c; Braakmann & Brandl, 2016).

Despite the robustness of the analyses in this study, there are some limitations, and therefore, results should be interpreted with caution. First, one of the difficulties with this type of research using country clustering is that to capture the industrial relations systems' complexity, many indicators have to be taken into account. However, the downside is that taking into account many indicators can make the outcome of the statistical clustering analysis less robust and dependent on the specific details of the clustering procedure, including for

example the weighting of individual variables. Second, because the original data contained a fair amount of missing values, methods like linear interpolation were used to fill in the blanks; this might have led to the inclusion of values that differ from the actual ones. Third, the sample used in this study was relatively small, since the number of European countries with a sufficient amount of data was not bigger than 21, resulting in 609 observations over a time span from 1990–2018. The limited number of cases can negatively influence the statistical power. Finally, this study did not include an indicator that might play a big role in explaining the results: the trust between social partners. For instance, the results of the Nordic countries, might perhaps as well by explained by the high sense of trust between the social partners as by the formal characteristics of the system (OECD, 2019c).

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Appendix

Table A1: Source of individual variables

Variable	Indicators	Source
Institutional embeddedness		
Minimum wage-setting		ICTWSS
Peace clause*		ICTWSS
Mediation in conflicts of interests*		ICTWSS
Additional company bargaining		ICTWSS
Articulation of company bargaining		ICTWSS
Opening clauses		ICTWSS
Works councils in wage-negotiations		ICTWSS
Price indexation		ICTWSS
Confederation coordinating wage–bargaining of affiliates		ICTWSS
Power union over workplace representatives		ICTWSS
Centralisation wage-bargaining union*		ICTWSS
Number of employers' confederations		ICTWSS
Number of union confederations		ICTWSS
Employers' organisation density		ICTWSS
Union density		ICTWSS
Adjusted bargaining coverage		ICTWSS
		ICTWSS
Employment		
Employment rate		OECD
Unemployment rate		OECD
Permanent employment		OECD
Employment index		OECD
Income		
Hourly earnings		OECD
Wage share		AMECO
Replacement rate		Eurostat
Equality		
Low pay incidence		OECD
Gender wage gap		OECD
Decile ratios of gross earnings		OECD
Gini market income		OECD
Control variables		
Youth dependency ratio		OECD
Old dependency ratio		OECD
Self–employment		OECD
CPIs		OECD
GDP growth		OECD
Share of women in labour force		OECD
Share of immigration	• Total immigration	Eurostat
	• Total population	Eurostat
Share economy agriculture and manufactory	Share of national economy attributed to:	
	• Agriculture hunting and forestry	OECD
	• Industry	OECD
	• Total national economy	OECD
Share economy commercial services	Share of national economy attributed to:	

	• Wholesale and retail trade, repair of motor vehicles and motorcycles	OECD
	• Transportation and storage	OECD
	• Accommodation and food service	OECD
	• Information and communication	OECD
	• Finance and insurance	OECD
	• Real estate	OECD
	• Professional, scientific and technical activities	OECD
	• Administrative and support service	OECD
	• Total national economy	OECD
Political structure	• Largest government party	World Bank
	• Second largest government party	World Bank
	• Third largest government party	World Bank

*Means the variable is included in the cluster analysis, but is not included in the multilevel analyses.

Table A2a: Average score of clusters on the scales and separate indicators for industrial relations

	1	2	3	4	5
Coordination and level	88	118	108	17	90
Favourability principle and no extensions	13	24	16	29	6
Minimum wage-setting	59	14	20	68	58
Institutionalized employee representation	79	86	43	27	58
Tripartite social pacts	20	19	15	5	31
Bipartite social pacts and negotiations confederation	22	26	24	4	30
Role of unions in CB and consult confederation	100	100	100	61	100
Flexibility of wage-setting and mediation	24	33	19	11	7
Tripartite council including confederation	78	61	30	48	59
Mediation	17	35	31	34	11
Peace clauses in CA	100	60	77	74	11
Additional enterprise bargaining	19	50	22	23	19
Articulation enterprise bargaining	50	0	35	32	39
Opening clauses	32	4	17	3	8
Price indexation	22	26	1	13	3
Works council in wage negotiation	28	13	15	13	31
Coordination bargaining confederation	50	42	37	2	31
Power of union over representatives	25	34	29	17	13
Employers organisation density	172	144	106	81	145
Union density	48	132	59	49	53
Bargaining coverage	170	170	127	66	171
Centralisation of CB	65	53	34	19	23
Number of employers' organisations	20	39	33	39	58
Number of union confederations	34	34	16	31	64

Table A3a: Robustness check: multilevel regression employment indicators (with control variables)

	Employment rate	**Unemployment rate**	**Permanent employment**	**Employment growth**
Cluster 1a (=ref.)	0	0	0	0
Spain	-6.74*	10.67*	-24.32*	1.15*
Cluster 2	-2.87*	0.99	1.51*	-0.14
Cluster 3	-0.28	2.43*	1.25*	-0.32
Cluster 4	-4.83*	3.20*	4.76*	0.08
Cluster 5	-4.06*	0.74	1.02	0.14

*Significant: p–value ≤ .05.

Table A3b: Robustness check: multilevel regression income indicators (with control variables)

	Earnings growth	**Wage share**	**Replacement rate**
Cluster 1a (= ref.)	0	0	0
Spain	1.13*	1.86*	-7.55*
Cluster 2	-0.10	-3.02*	-9.51*
Cluster 3	-0.67	-2.86*	-14.97*
Cluster 4	1.17*	-5.43*	-7.66*
Cluster 5	-1.06*	0.63	-8.61*

*Significant at a p–value ≤ .05.

Table A3c: Robustness check: multilevel regression inequality indicators (with control variables)

	Low pay incidence	**Gender wage gap**	**Decile ratios of gross earnings**	**Gini market income**
Cluster 1a (=ref.)	0	0	0	0
Spain	0.52	-2.19*	0.37*	1.16
Cluster 2	-5.10*	-7.72*	-0.88*	-1.99*
Cluster 3	2.01*	0.72	-0.03	-1.61*
Cluster 4	4.27*	-3.71*	0.23*	2.17*
Cluster 5	-0.15	-7.23*	-0.15*	1.41*

*Significant: p–value ≤ .05.