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## An Institutional Approach to Trade Union Density. The Case of Legal Origins and Political Ideology

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**Abstract:** Which institutions may be important in terms of trade union density and how significant they are? Although the status of trade unions may be very different among states, unions are still a very meaningful component of labour markets. In this paper, we contribute to the debate about the institutions that may affect the outcome of trade unions in different legal systems. Firstly, we draw on the theoretical underpinnings of trade union activity and density. Then, we conduct an empirical analysis of the relationships between trade union density in a particular country, country's legal origins and government's ideology. In this way, the paper enriches an underexploited niche in institutional research devoted to labour market issues.

**Keywords:** institutions, trade unions, legal origin, party ideologies.

**JEL Codes:** J51, K40, P16

## 1 Introduction

There is a lot of research on the role that trade unions play in modern labour economics (Oswald 1985; Ebbinghaus 2002; Ashenfelter and Johnson 1969), but this sphere has to be examined with reference to other social sciences due to its complexity. Trade unions perform under specific legal regulations. This present work is related to institutional forms of trade union density, from a law and economics perspective. The main research question is whether legal origins and government ideologies have an impact on union density.

The functioning of trade unions is an interdisciplinary and complex issue (Rees 1989). Research tools taken from law and sociology significantly enrich formal economic trade unions models, making them easier to apply from a law and economics perspective. The analysis presented in this article consists of three parts, which are the presentation of the basic foundations of trade unions, the review of the literature on legal origins and ideologies of political parties and their impact on trade union density and finally the empirical model. A particularly important section of this article is the last one, dedicated to an empirical evaluation of union density determinants. The model is based on the panel data for 28 Organisation for Economic Co-operation and Development (OECD) members and is devoted to the union density issue. It includes general macroeconomic variables and the aforementioned legal origins and government ideologies. The main aim of the article is to empirically investigate the impact of legal origins and government ideologies on trade union density.

## 2 The economic foundations of trade unions

Trade unions may be perceived as a form of voluntary organization associating employees and other social groups whose interests are based on the employment relationship. The main objective of unions is to protect employees' interests against employers (Wratny and Bednarski 2010). Trade unions are the oldest and best-known models of representation linked with employment issues. They are defined as permanent associations, the aims of which are to maintain or to improve working conditions (Webb and Webb 2003). This designation is very general, but in fact, trade unions are heterogeneous. Numerous models have been developed among different countries (Lewkowicz 2015). Employees' unions may differ in their internal structure, the range of agreements made, their participation in management processes, their relationships with government and political parties or in their contribution to the social dialogue (Wratny and Bednarski 2010).

There are different approaches towards trade unions. The divergence approach assumes that differences between them have mostly historical roots (Clegg 1976). This diversity is determined usually by organizational, technological, social, ideological, and political issues. Trade union activity and involvement are specific for every particular country and this partially results from the unique development of unions (Freeman 1994). On the other hand, the convergence perspective emphasizes common patterns of diffusion between trade unions as a result of globalization and the presence of transnational institutions.

B. Ebbinghaus investigates some European models of trade union activity, including labour unionism, solidaristic unionism, polarized pluralism, sectional plu-

ralism and consolidated unionism (Ebbinghaus and Visser 2000). Labour unionism is relatively typical for the British system. Each trade union there (industrial, professional or general) is independent to a large extent. Solidaristic unionism originated in Scandinavian states. Solidaristic trade unions are involved in activity within the welfare state model. Conflicts and political opportunism led to the exclusion of union representatives from political structures (e.g., Spain, Portugal, Italy). Sectional pluralism, in turn, assumes that trade unions divide into different groups (religious and secular). Consolidated unionism rests on harmonization and social cooperation that may be reached because of dedicated institutions (Germany, Austria).

What is more, three types of union activity criteria should be highlighted (Lewkowicz 2015). There are unions whose main aim is to be involved in conflict between work and capital. Secondly, some trade unions focus on improving working conditions (pure unionism). Last but not least, trade unions may try to cope with a broader scope of problems, e.g., those linked with labour policy or globalization. These different types of trade union activities do not have to be treated as separate (Hollinshead and Leat 1995). There are specific models that include interactions between several trade union goals. For instance, R. Hyman (2001) analyses the relationships and convergences that link different trade unions. These relationships may concern the sectional unionism model, the workers' service orientation or employee roles in the society.

Despite the large number of trade union models and their strong heterogeneity, as well as divergent political circumstances, the existence of such unions is still perceived as a necessary element of social order (Wratny and Bednarski 2010). They are a significant social partner and some kind of force that acts in opposition to employers (Lewandowski 1996).

Empirical research devoted to trade unions focuses to a large extent on their effects on wages and other labour market variables (e.g., productivity or employment) (Lewkowicz 2015). Studies point out that the union wage premium is positive, so in general, unions members may earn more (Card 1996). The scope of the premium depends on the way that wages in unionized sectors spread into those that are non-unionized. Union premium wages vary between countries (Blanchflower and Bryson 2002).

The higher bargaining power of trade unions results in the increase of wages. This power depends in turn not only the political links of a particular union, but also on

union density. The more members a trade union has, the more bargaining power it gets. However, the impact of unions on employment levels is ambiguous (Card 1990). Trade unions are sometimes treated as a factor that restrains a firm's development. Employers limited by trade unions claim that they are not able to use firm's potential fully (Addison and Hirsch 1989). Thus, as a result, unionized companies may be less attractive for investors (Machin and Wadhvani 1999). On the other hand, another study reveals that trade unions support the management and assist in knowledge diffusion (Freeman and Medoff 1985). Trade unions may influence a firm's productivity positively, because of increased employee retention. Wages negotiated by trade union representatives could motivate employees to perform better (Cahuc and Kramarz 1997). There are some economic models that assume a convergence of trade union and firm objectives. According to such models, trade unions should support the development of firms (Aidt and Sena 2005). It is difficult to judge trade unions clearly, i.e., because there is a difficulty in isolating the casual effect of union activity from any selection biases. However, the effects of their activity are related to their bargaining power and their bargaining power depends mostly on union density.

### 3 Trade union density

Trade unions are perceived as successful organizations if they manage to provide a collective protection of employment and succeed in wage bargaining. The power of trade unions increases when union density is higher. Their bargaining power usually develops as a consequence. Union density, in turn, is dependent not only on particular trade union characteristics (i.e., selective benefits or reputation), but also on institutional issues and the political management of reforms (Lesch 2004). We are aware of the fact that unionization at different levels – firm, local, sectoral or national – may have different types and magnitudes of impact on labour markets and economic growth. Indeed, trade unions which are representative at the national level may influence legislation and labour market policies, which are factors that to some extent determine economic growth. Sectoral or local trade unions, in turn, can affect economic growth significantly, especially in cases of the development of specific market branches. Firm-level trade unions also should not be neglected, as

long as they shape the functioning of individual entities. However, mainly because of the difficulties in achieving such specific data and dedicated literature, we decided to explore this issue from a general perspective.

There is a broad literature on trade union membership (density), both in its theoretical and empirical dimensions. Some papers contribute to bridge the gap between theoretical developments in economic models devoted to trade union density and the empirical framework (Checchi and Corneo 2000). For example, Checchi and Corneo stress the importance of so-called social customs and other strategic factors. Their empirical model is narrowed to the Italian case. These authors reveal that in this particular circumstance, the social custom effect does not affect union membership. Their analysis concludes that Italian union representatives act strategically, *i.e.*, in order to promote unionism in periods of large available surplus. What is more, both labour legislation in favour of union membership and the degree of centralization of union activity foster unionization.

There are also other studies regarding the determinants of unionization during the last century. For instance, in Finland, union density has risen about 60 percentage points in 32 years (Pehkonen and Tanninen 1997). The authors of the Finnish study base their work on theoretical underpinnings, with special attention on the institutional features of the Finnish labour market. Particularly, they take into account background information obtained from surveys, including questions about why workers join or remain members of a union. Their findings concerning the period 1960–1992 reveal that empirical models are capable of explaining long-term changes in union density to a quite satisfactory degree. Institutional features of the Finnish labour market play a crucial role in determining union density (characterized mainly by the benefit mark-up, legislative changes and public policy).

Short-term and long-term analyses show that union membership decline during the 1980s and 1990s is endogenous to a large extent to labour market changes. The impact of such changes is mediated by a specific set of labour market institutions (Checchi and Visser 2005). In Europe, union density rates declined because of unemployment developments, a drop in public employment, a decrease in inflation, the advent of new workplaces less covered by unions and a decline in strike activity. However, it is important that institutional differences account for diverging union density rates in European countries. Even the effects of economic globalization are marginal in terms of particular economic institutions

that help to explain divergent trends in trade union density (Scruggs and Lange 2002).

It seems that some institutions crowd out trade unions. For instance, job security legislation or wage indexation may result in a decrease in trade union density. On the other hand, some institutions are associated with higher degree of unionization, *e.g.*, workplace representation or centralized wage bargaining (Checchi and Lucifora 2002). An important finding is that there is no generalized downward trend in European trade union density. Aggregate figures tend to present a very heterogeneous picture of unionization.

Trade union membership differs across countries. Particular legal and political factors determine the shape of unionization. As a result, many empirical studies suffer measurement errors or suffer from an inability to quantify some of the strategic factors. An example of such a strategic factor may be the quality of union leadership (Ashenfelter and Pencavel 1969).

## 4 Legal origins and government ideology

It is necessary to refer to literature on labour regulation and legal origins. It may be stated that labour market legislation usually refers to different spheres, like minimum working conditions, minimum wages and many others (Siebert 2005). What is important is that labour regulation also requires a monitoring mechanism, conducted by trade unions or a labour inspector or both. Siebert claims that both the political and the legal origins of a system, may serve as the source of particular labour market policies. The political theory is linked with the median voter theory. For instance, the median voter usually benefits from attractive wages and good working conditions. On the other hand, unemployed people are too dispersed to make any significant difference in political issues. Naturally, political parties strive to gain as many votes during the political cycle as they can. Additionally, the legal origins theory can be applied to this problem as long as it influences the path dependence. The legal systems may be laden by specific regulations that are hard to change (high transaction costs of changes), as is the case in the French or German legal traditions. The English legal system is perceived as a free-market tradition, which is much more elastic.

Studies on the importance of the legal origins of a country for the path of its economic development may

undoubtedly provide some inspiring conclusions for analyses of trade union density. Ahlring and Deakin (2007) consider whether the common law or civil law origins of legal systems have influenced the development of different countries from an economic perspective. It becomes more and more clear that the law is significant for economic development. It is also often stated that common law institutions are better suited to the promotion of market-based economic systems. Ahlring and Deakin, however, came to the conclusion that the legal indexing methods used by the legal origins school are able to measure only formal law. Thus, they provide a relatively weak proxy of the economic and social impact of legal regulations. They also state that the theoretical basis dedicated to the legal origins claim is weak. In fact, the legal origins school does not properly describe the common law and civil law distinction. It is true that, since these two systems are in fact incomparable, it is not immediately obvious which system is better. Nevertheless, the legal origins issue remains very important in terms of path dependence.

In the long run, legal styles and origins have an influence on economic development. Additionally, enduring complementarities between legal and economic institutions may be significant for the diversity in labour regulation across states (Ahlring and Deakin 2007). As long as the legal origins hypothesis suffers from limitations, a deeper engagement with historical evidence will be proposed as a solution to this impasse. It becomes clear that a factor critical to the relationships between the legal system and economic development is the timing of industrialization with respect to the core legal institutions of market economies. Naturally, this also concerns labour markets. For instance, Britain's early Industrial Revolution began before legal regulations for the employment relationships were introduced. In France or Germany, this sequence was reversed – the modernization of the legal systems preceded industrialization. It should be also noted that national legal systems are specific and may only be classified by legal orders to a limited extent.

Thus, it is observable that types of legal origins are relevant in terms of economic development, labour market conditions and in the evolution of unionism (different types of trade unions). Following the pattern established in the economic literature, we distinguish five types of legal origins: French, English, German, Scandinavian and socialist (La Porta *et al.* 1999). Such a division is adequate for our needs in the empirical study (please see the following section). There are sub-types

of legal origins, but greater elaboration on this issue is not necessary for the analysis of trade union density.

Cross-national differences in union density are also explained by the size of the labour force (Wallerstein 1989). Differences may occur as long as trade union gains due to collective bargaining depend on the proportion of substitutable employees that are organized. Trade unions in larger and more developed labour markets will accept lower levels of unionization. On the other hand, trade unions in smaller labour markets may gain high levels of unionization more cheaply. What is crucial for this paper is the cumulative participation of the leftist parties in government. This explains most of the differences in unionization rates among advanced societies in the late 1970s (the size of the labour force and the cumulative participation of the leftist parties in government explain almost three-quarters of the variance in trade union density).

New dynamic models of union density may in turn exhibit path-dependency and multiple equilibria (Palley and LaJeunesse 2007). Recent works on labour markets and union density also emphasize the significance of the state and socio-economic factors that may have an impact on public attitudes towards trade unions. In fact, trade unions are institutions, which exist within a society. Their ability to develop is dependent mostly on labour law and public support. Legal rules and administrative rules or restrictions matter immensely (Morris 1998). In more detailed terms, laws that govern employer rights of dismissal, employee rights to obtain redress in cases of unfair dismissal or employee rights to form unions are critical (Palley and LaJeunesse 2007). In other studies, crucial institutions for union density have been identified, including strong working class political parties, union-run employment insurance and centralized collective bargaining (Western 1997). These factors are inevitably linked with the supply and demand for union services, which affect union density in the next step.

The impact that the leftist parties in government have on unionization is observable in most studies. Bean and Holden (2001) prove that higher trade union density is associated with a centralization of wage bargaining and a higher percentage of employees covered by collective bargaining, as well as with a larger public sector and more leftist parties in governments, in their study of 16 selected OECD countries in the 1980s.<sup>1</sup> This might

<sup>1</sup> Sweden, Denmark, Belgium, Norway, Austria, Australia, Ireland, UK, Italy, West Germany, Switzerland, Canada, Netherlands, Japan, France, USA.

be because leftist parties are usually pro-labour in their ideology (e.g., they favour equality and social justice). Thus, leftist parties very often support the labour movement and this may lead to higher union density. In our study, we investigate the impact of the leftist ideology of the head of the government on trade union density. One of the advantages of such a measure is that it is the government that usually plays the crucial role in shaping a country's labour policy. Therefore, it seems more relevant to draw attention to the government's ideology rather than to the composition of parliament. There is a natural question of endogeneity when considering leftist government ideology as an explanatory variable in the context of trade union density. However, we argue that due to typical levels of unionization, election promises and the scope of government duties it is rather unrealistic to believe that a higher degree of unionization would lead to the election of leftist parties. All in all, the issue of the influence of leftist parties on trade union density seems to be underdeveloped.

The main aim of the paper is to use the legal and economic research apparatus to address the question of whether the legal origins and government ideology matter in terms of union density. Although there is a broad literature on the role of trade unions and union density, detailed research on the importance of the legal origins with reference to unionization seems to constitute a lacuna. Additionally, there have been attempts to reveal the significance of parliamentary ideology. However, these studies covered just a small fraction of the problem (it was usually an additional issue within the papers described above).

## 5 The model

### 5.1 Database and variables

In our empirical analysis, we use panel data for 28 OECD members<sup>2</sup> for the period 1995–2014. The selection of the countries for the research has been predetermined by the availability of the data. In the database, there are missing

<sup>2</sup> Australia, Austria, Belgium, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Israel, Italy, Japan, South Korea, Luxembourg, Netherlands, New Zealand, Norway, Poland, Portugal, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, United Kingdom, United States.

observations; therefore all of our calculations are conducted on the unbalanced panel data set.

For the purpose of our analysis, we have divided variables into three groups, i.e., labour force characteristics variables, economy characteristics variables and institutional characteristics variables. Therefore, the key regression of our research is as follows:

$$\text{trade\_density}_{it} = \text{LFCh}_{it} + \text{ECh}_{it} + \text{ICh}_{it} + \varepsilon_{it} \quad (1)$$

where  $\text{LFCh}_{it}$  is a set of labour force characteristics variables that describe the percentage of women in the labour force (*female\_proc*), the percentage of the labour force employed in the industry sector (*proc\_industry*) and the percentage of the labour force employed in the service sector (*proc\_services*).  $\text{ECh}_{it}$  stands for the economic characteristics of a given country and is expressed by unemployment (*unempl*), inflation (*infl*), GDP per capita growth (*gdp\_growth*) and population growth (*pop\_growth*). Finally, institutional characteristics ( $\text{ICh}_{it}$ ) variables are the legal origins (*englo*, *gerlo*, *scanlo*, *soclo*, *frlo*) and the time-lagged ideology of the head of the government (*centr\_ideology*, *right\_ideology*, *left\_ideology*). The use of time lags in the case of the government ideology variables is justified by the observation that workers need time to adjust to political changes. Therefore, the appearance of new institutions due to such changes should occur with a time lag. Detailed information about the construction and sources of the abovementioned variables has been provided in Appendix 1. Appendix 2 presents the descriptive statistics. All variables except for the legal origins variables vary with time.

### 5.2 Analysis of the variance model: Two-way ANOVA

The first part of our empirical research concentrates on the issue of the relationship between the trade union density in a given country with the country's legal origins and its government's ideology. According to the theory, the institutional environment in which trade unions function should have an impact on their membership. With their legal systems, countries can support the trade unions' existence by convenient procedures of their establishment, by providing in the constitution the right to form or to join trade unions or by protecting the rights of the trade union members from employer or state interference. We assume that the channels of such support are predetermined by the legal origins of

a country and the political ideology of the government. According to the literature, it is usually expected that leftist parties in the parliament are key, from the perspective of unionism. Tab. 1 presents the mean values of the trade union density in groups determined by the country's legal origins and the ideology of its head of government. We are aware of the fact that rightist, leftist and centrist ideologies may have different meanings among states. In our analysis, we adapt the approach of Brambor, Lindvall and Stjernquist (2014). Thus, centrist ideology refers especially to social liberalism and other similar kinds of orientation. Missing data are imputed on the basis of political party programmes, as they are available. Leftist attitude indicates, e.g., communist, socialist, social democratic ideologies or an otherwise strongly redistributive platform. Rightist ideology, in turn, refers to conservative, Christian democratic or market-liberal programmes. Legal origins have been assigned in line with the methodology presented by La Porta, Lopez-de-Silanes, Shleifer and Vishny (1999).

**Tab. 1.** Mean values of the trade union density in groups determined by the legal origins and the ideology of the head of the government (for the period 1995–2014)

Legal origins	Head of government		
	Centre	Left	Right
English	25.563	26.272	27.008
French	29.85	22.181	30.380
German	19.086	25.701	20.092
Scandinavian	34.998	66.181	60.281
Socialist	23.729	26.345	23.463

Source: Author's own calculations.

A brief analysis of the data enables us to conclude that the mean values of trade union density varies among countries of different legal origins and political ideologies. The highest values of trade union density have been reported for the leftist countries of Scandinavian legal origin and the lowest for the centrist countries with legal systems of German origin. Therefore, the preliminary aim of our analysis is to test whether there is a significant difference between the mean values of the

trade union density in groups of countries of different legal origins and government ideologies.

The model that should be applied to verify this issue is a two-way analysis of variance model (two-way ANOVA). In the case of our data, we reported violations of the standard assumptions of ANOVA, e.g., the trade union density data in groups of countries with different legal origins do not have a normal distribution. However, in the literature it is stated that ANOVA is rather robust to the assumption of the normal distribution of the observations and of the homogeneity of variances, as long as we have relatively large groups in the sample (more than 20 observations in each group) and the sample is free from outliers (Theodorsson-Norheim 1986). In the case of our study, we work with a large sample (534 observations) and for each group of countries we have more than 20 observations (Tab. 2).

**Tab. 2.** Number of observations in each group

Group	Number of observations
Countries of English legal origin	98
Countries of socialist legal origin	94
Countries of German legal origin	96
Countries of French legal origin	150
Countries of Scandinavian legal origin	96
Countries with leftist ideology	190
Countries of rightist ideology	253
Countries of centrist ideology	91

Source: Author's own calculations.

Tab. 3 presents the results of the estimation of the two-way ANOVA model. The obtained values of F statistics suggest that there exist significant differences between mean values of trade union density data in groups of countries of different legal origins and government ideologies.

What is more, there is a significant interaction between the independent variables (legal origins and government ideology) and the dependent variable (trade union density). In other words, the effect of the legal origins of the country on the trade union density is

Tab. 3. Two-way ANOVA

Source	Partial SS	Degrees of freedom	MS	F	Probability>F
model	100619.206	14	7187.08617	39.86	0.0000
legalorigins	57856.7897	4	14464.1974	80.22	0.0000
governmentideology	1768.76342	2	884.381712	4.90	0.0078
legalorigins # governmentideology	13755.8119	8	1719.47649	9.54	0.0000
residual	93577.3885	519	180.303253		
Total	194196.595	533	364.346332		
Number of observations	534				
Root MSE	13.4277				
R <sup>2</sup>	0.5181				

Source: Author's own calculations.

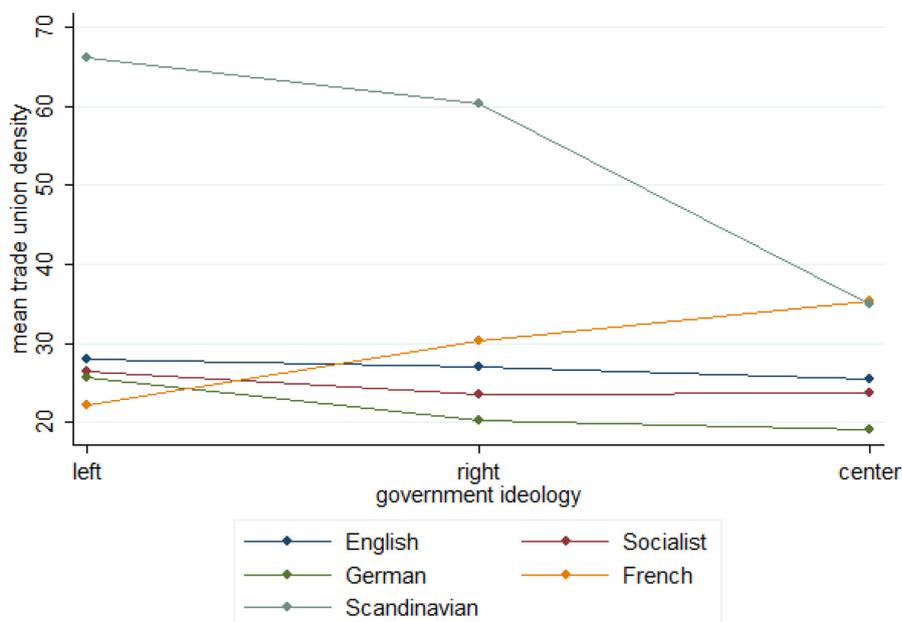


Fig. 1. Interactions between legal origins and government ideology

Source: Author's own calculations.

influenced by the government's ideology. To investigate the details of these interactions, it is essential to conduct a graphical analysis. Fig. 1 presents the interactions between legal origins and government ideology. From the graph, it can be seen that for countries of Scandinavian, socialist and German legal origin, the mean values

of the trade union density are higher when the head of the government represents leftist ideology and lower when she or he is of rightist ideology. For countries of French and English legal origin, the dependence is of the opposite direction.

From the outcomes of the aforementioned analysis, it appears that both a country's government ideology and its legal origins may be perceived as determinants of the trade union density.

### 5.3 Panel data estimation

In order to specify the determinants of trade union density in the OECD countries, we have conducted a panel data regression. Tab. 4 presents the results of the panel data estimation for two models, a pooled ordinary least squares (pooled OLS) regression (I) and a Prais-Winsten regression, with correlated panels and corrected standard errors (II). Such a specification has been chosen on the basis of several diagnostics tests, i.e., the Jarque-Bera test of normality of residuals, the Wald test of heteroscedasticity and the Woolridge test for first-order autocorrelation. The outcomes of the tests indicate that the model does not fulfil the assumptions indispensable for standard fixed effects or random effects estimation.<sup>3</sup> Therefore, panel-correlated standard error estimates have been calculated. This method is an alternative to feasible generalized least squares for fitting linear cross-sectional time-series models when the disturbances are not assumed to be independent and identically distributed. In this method, it is assumed that disturbances are heteroscedastic and correlated across panels. An additional option specifying that there is a correlation across panels has been chosen and the Prais-Winsten estimator has been used.

Tab. 4 presents the outcomes of the panel data estimations. The results of the more reliable Prais-Winsten estimation (II) suggest the presence of seven significant determinants of the trade union density that are related to either characteristics of the labour force or to the economy or the institutional environment. With regard to the first, we confirm the relevance of the percentage of women in the labour force and the scope of employment in the industry and services sectors. According to our results, the percentage of women in the labour force affects trade union density significantly, but in a negative direction. Such a phenomenon may occur because, according to the literature, women tend to engage less in trade union activity than men do (see, e.g., the Current Population Survey [CPS] Outgoing Rotation Group and national statistics). As a result, in labour markets with a higher fraction of women in the workforce, the

unionization rate is lower. An increase in employment in the industry sector causes an increase in the trade union density, not unexpectedly, as trade union activity is traditionally associated with industrial sector. On the contrary, an increase of employment in the services sector should contribute to trade union density decline. Furthermore, within the scope of economic determinants, we have found a significant positive effect of wages (although it is almost equal to zero), unemployment and inflation. The effect of unemployment may be attributed to the fact that people who are faced with the risk of losing their job seek protection within the structures of trade unions that have measures to protect their members from dismissals. Rising inflation contributes to higher trade union density. It may occur as long as employees perceive trade unions as organizations successful in bargaining over wages. Thus, inflation may lead to wage pressure, and employees are more prone to join unions under such pressures. However, this is just one of the factors affecting trade union density. With regard to the existing theory, the most crucial determinants of trade union density are legal regulations and the historical evolution of unionism in a state. Finally, and most importantly, our model indicates a significant impact of legal origins and leftist ideology of the head of the government on trade union density. From the outcomes of the research it appears that a country that is of Scandinavian, German, French or English legal origin is characterized by a higher level of trade union density than a country of socialist legal origin. Therefore, it may be concluded that the legal environments of countries with a socialist legal heritage are less supportive of the occurrence and maintenance of such labour market institutions as trade unions. What is more, from the analysis it can be seen that a change of government ideology from centrist to leftist may result in the increase of the trade union density. Thus, it appears that a leftist political environment strengthens trade unions.

Furthermore, we have completed a robustness check of our results (III–VII in Tab. 4). The procedure is as follows: we repeat the estimation five times, each time excluding one group of countries of a given legal origin. Such a check allows us to find out whether the obtained results are not driven solely by one group of countries. The outcomes of the robustness check indicate that our estimates are stable and independent of the individual characteristics of only one group of countries.

<sup>3</sup> Jarque-Bera test:  $X^2_2$  statistics equals 45.57, Wald test:  $X^2_{27}$  equals 150.41, Woolridge test statistics  $F(1, 24)$  equals 142.592.

Tab. 4. Results of estimations

Independent variables	I	II	III	IV	V	VI	VII
<i>scanlo</i>	58.510** (25.68)	56.052** (27.85)	-	56.376** (28.96)	66.430** (25.92)	63.743** (32.34)	-
<i>gerlo</i>	4.011* (1.75)	3.348* (1.81)	16.761** (6.55)	-	16.371** (6.43)	4.314** (2.29)	-51.337** (-44.87)
<i>frlo</i>	15.182** (6.76)	11.815** (4.83)	13.255** (5.43)	11.465** (3.85)	-	12.893** (5.25)	-43.735** (-53.16)
<i>englo</i>	15.552** (5.78)	13.001** (5.88)	31.241** (10.58)	12.802** (4.81)	26.334** (8.69)	-	-43.968** (-29.13)
<i>soclo</i>	-	-	-	-	-	-	-
<i>lag.cent_ideology</i>	-	-	-	-	-	-	-
<i>lag.left_ideology</i>	1.769 (1.25)	0.688** (2.09)	0.610* (1.68)	0.645* (1.87)	0.778** (2.33)	1.141** (2.25)	0.352 (1.22)
<i>lag.right_ideology</i>	1.958 (1.38)	0.420 (1.42)	0.273 (0.91)	0.396 (1.11)	0.268 (0.94)	0.807 (1.68)	0.276 (1.12)
<i>wage</i>	5.913 X10 <sup>(-4)**</sup> (7.20)	2.561 X10 <sup>(-4)**</sup> (5.25)	1.828 X10 <sup>(-4)**</sup> (2.06)	2.083 X10 <sup>(-4)**</sup> (2.98)	-1.366 X10 <sup>(-4)**</sup> (-2.51)	5.962 X10 <sup>(-4)**</sup> (9.01)	0.684 X10 <sup>(-4)**</sup> (1.61)
<i>female_proc</i>	-0.862** (-4.41)	-0.750** (-4.98)	-0.613** (-4.44)	-0.918** (-6.14)	-0.345* (-1.73)	-0.344** (-3.40)	-0.799** (-6.05)
<i>gdp_growth</i>	0.101 (0.06)	-0.022 (-0.62)	-0.041 (-0.87)	-0.019 (-0.47)	-0.031 (-0.97)	-0.061 (-0.96)	0.004 (0.29)
<i>pop_growth</i>	-1.183 (-1.14)	-0.050 (-0.27)	0.221 (1.29)	-0.053 (-0.14)	-0.031 (-0.21)	0.140 (0.60)	0.059 (0.54)
<i>proc_industry</i>	1.779** (12.43)	0.954** (6.20)	1.418** (7.53)	0.991** (6.75)	0.443** (2.87)	2.093** (14.06)	1.150** (6.07)
<i>proc_services</i>	-0.036 (-0.29)	-0.264** (-2.94)	-0.443** (-7.03)	-0.170* (-1.78)	-0.819** (-6.97)	-0.472** (-8.01)	0.321* (2.65)
<i>unempl</i>	0.767 (3.73)	0.152** (2.75)	0.224** (3.65)	0.141** (2.13)	0.301** (4.24)	0.153** (2.28)	0.144** (4.69)
<i>infl</i>	0.714** (3.35)	0.096* (1.85)	0.189** (3.06)	0.106* (1.94)	0.081* (1.65)	0.243** (3.13)	-0.080** (-2.07)
<i>constant</i>	-	42.700** (5.43)	33.947** (3.40)	44.189** (4.98)	80.021** (6.91)	-	58.739** (5.76)
number of observations/ number of groups	445/-	445/27	327/23	394/23	303/19	369/22	342/21
$R^2$	0.9385	0.8142	0.7972	0.8196	0.8796	0.9660	0.8545
F-statistic=	469.67	Wald $X_{14}^2 =$ 22882.29	Wald $X_{13}^2 =$ 396.05	Wald $X_{13}^2 =$ 3290.84	Wald $X_{13}^2 =$ 5297.69	Wald $X_{13}^2 =$ 174291.43	Wald $X_{13}^2 =$ 4081.54

Notes: Values of t-statistic (in the case of pooled OLS regression) and z-statistic (in case of Prais–Winsten regression) in brackets.

\*\* Significant at 5% level. \* Significant at 10% level.

**I** – Pooled OLS Regression, **II** – Prais–Winsten regression, correlated panels corrected standard errors (countries of Scandinavian legal origin excluded), **III** – Prais–Winsten regression, correlated panels corrected standard errors (countries of German legal origin excluded), **IV** – Prais–Winsten regression, correlated panels corrected standard errors (countries of French legal origin excluded), **V** – Prais–Winsten regression, correlated panels corrected standard errors (countries of English legal origin excluded), **VI** – Prais–Winsten regression, correlated panels corrected standard errors (countries of socialist legal origin excluded).

Source: Authors' own calculations.

## 6 Conclusions

To sum up, the main focus of this paper was the determinants of union density. Despite the fact that trade unions are very heterogeneous and differ vastly between states, they usually play an important role as a partner in a social dialogue and as a labour market actor in a broader perspective. In addition, the economic effects of union activity seem to be ambiguous. It may be stated that the bargaining power of trade unions depends on several factors, but above all on their membership levels. Thus, we refer to the literature on union density. Factors like the individual characteristics of trade unions, leftist ideology among political parties and English legal origins seem to affect union density positively.

The two-way analysis of the variance model conducted for 28 OECD countries confirms our hypothesis about the significant impact of a country's legal origins and the impact of the ideology of the head of the government. Furthermore, the model showed a significant interaction between independent variables (legal origins and government ideology) on the dependent variable (trade union density), which signifies that the effect of the legal origins of the country on the trade union density is influenced by the government ideology.

The empirical model encompassing 28 OECD members reveals that the factors that are statistically significant for trade union density are the percentage of women in the labour force, the scope of employment in the industry and services, the level of wages and the unemployment and inflation rates. It is also evident that the legal origins of the particular country and the leftist ideology of its government have a significant impact on the union density. However, this evidence seems to be more sophisticated than that usually presented in the literature; such results underline the importance of the institutional environment on the occurrence and maintenance of trade unions. It appears that for workers, what matters is not only the economic incentives to join the trade union, but also the legal and political environment that surrounds him or her. What is more, from our analysis it is clear that socialist legal origins are the least favourable for the existence of trade unions. With this paper, we aimed to contribute to a better understanding of the nature of union density, with special reference to the significance of legal origins and the ideology of political parties. Given the gaps and contradictions in the existing literature, we believe that applying the proposed approach in future studies of labour market institutions and their factual execution will lead to more consistency

and less confusion in the analyses conducted by theoretical and empirical researchers in the field. As a final step, more systematic empirical analysis will allow for the formulation of more reliable policy recommendations.

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## Appendix

Tab. A. Description and sources of variables

VARIABLE	DESCRIPTION	SOURCE
<i>centr_ideology</i>	A binary variable, it takes the value 1 for the ideological orientation of the head of government - CENTER (i.e., various centrist ideologies, especially social liberalism). Missing data have been imputed by authors on the basis of available political parties' programmes.	Brambor T, Lindvall J and Stjernquist A (2014) <i>The Ideology of Heads of Government (HOG)</i> , 1870-2012. Sweden: Department of Political Science, Lund University.
<i>englo</i>	A binary variable, for the country of English legal origin it takes the value 1	La Porta R, Lopez-de-Silanes F, Shleifer A and Vishny R (1999) The Quality of Government. <i>Journal of Law, Economics, and Organization</i> 15: 222-279.
<i>female_proc</i>	Percentage of female workers in the labour force	OECD.Stat, Dataset: LFS
<i>frlo</i>	A binary variable. For the country of French legal origin it takes the value of 1.	La Porta R, Lopez-de-Silanes F, Shleifer A and Vishny R (1999) The Quality of Government. <i>Journal of Law, Economics, and Organization</i> 15: 222-279.
<i>gdp_growth</i>	Annual percentage growth rate of GDP at market prices based on constant local currency	World Development Indicators, Wold Bank
<i>gerlo</i>	A binary variable. For the country of German legal origin it takes the value of 1	La Porta R, Lopez-de-Silanes F, Shleifer A and Vishny R (1999) The Quality of Government. <i>Journal of Law, Economics, and Organization</i> 15: 222-279.
<i>infl</i>	Inflation as measured by the consumer price index.	World Development Indicators, Wold Bank
<i>left_ideology</i>	A binary variable. It takes the value of 1 for the ideological orientation of the head of government - LEFT (i.e., communist, socialist, social democratic, or with an otherwise strongly redistributive platform). Missing data have been imputed by the authors on the basis of available political parties' programmes.	Brambor T, Lindvall J and Stjernquist A (2014) <i>The Ideology of Heads of Government (HOG)</i> , 1870-2012. Sweden: Department of Political Science, Lund University.
<i>pop_growth</i>	Population growth (annual %).	World Development Indicators, Wold Bank
<i>proc_industry</i>	Employment in industry (including energy) as a percentage of total employment.	OECD.Stat, Dataset: LFS
<i>proc_services</i>	Employment in the services sector as a percentage of total employment.	OECD.Stat, Dataset: LFS
<i>right_ideology</i>	A binary variable. It takes the value of 1 for the ideological orientation of the head of government - RIGHT (i.e., conservative, Christian democratic, market-liberal). Missing data have been imputed by the authors on the basis of available political parties' programmes.	Brambor T, Lindvall J and Stjernquist A (2014) <i>The Ideology of Heads of Government (HOG)</i> , 1870-2012. Sweden: Department of Political Science, Lund University.
<i>scanlo</i>	A binary variable. For a country of Scandinavian legal origin it takes the value of 1.	La Porta R, Lopez-de-Silanes F, Shleifer A and Vishny R (1999) The Quality of Government. <i>Journal of Law, Economics, and Organization</i> 15: 222-279.
<i>soclo</i>	A binary variable. For the country of socialist legal origin it takes the value of 1.	La Porta R, Lopez-de-Silanes F, Shleifer A and Vishny R (1999) The Quality of Government. <i>Journal of Law, Economics, and Organization</i> 15: 222-279.
<i>trade_density</i>	trade union density defined as the ratio of wage and salary earners that are trade union members divided by the total number of wage and salary earners.	OECD.Stat, Dataset: LFS
<i>unempl</i>	Unemployment, total (% of total labour force)	World Development Indicators, Wold Bank
<i>wage</i>	Average annual wages in 2015; constant prices at 2015 USD PPPs.	OECD.Stat, Dataset: LFS

Source: Authors' own calculations.

Tab. B. Descriptive statistics of continuous variables

Variable		Mean	Standard deviation	Min	Max	Number of observations
<i>trade_density</i>	overall	31.26239	19.08786	5.654338	83.13813	N = 534
	between		18.6396	7.901695	74.92628	n = 28
	within		5.148027	16.77425	60.6157	T = 19.0714
<i>wage</i>	overall	35584.39	11602.42	8571	60196	N = 550
	between		11327.89	15155.2	54698.5	n = 28
	within		3048.24	26301.74	45284.74	T-bar = 19.6429
<i>female_proc</i>	overall	44.55367	2.75064	36.06719	50.85168	N = 560
	between		2.508818	39.59661	49.14098	n = 28
	within		1.218928	39.32568	48.80525	T = 20
<i>gdp_growth</i>	overall	2.414583	2.911034	-14.7244	11.7986	N = 558
	between		1.11048	0.5949518	4.616528	n = 28
	within		2.69923	-16.71889	9.791065	T-bar = 19.9286
<i>pop_grow</i>	overall	0.5135072	0.6639038	-1.7854	2.89096	N = 560
	between		0.5701864	-0.533331	2.099166	n = 28
	within		0.3559581	-1.149776	2.694526	T = 20
<i>proc_industry</i>	overall	17.74659	5.480131	9.164394	32.67896	N = 522
	between		5.124759	11.21641	29.72359	n = 28
	within		1.909545	13.24477	23.42335	T-bar = 18.6429
<i>proc_services</i>	overall	77.00743	8.023138	53.31408	89.66506	N = 502
	between		7.582936	61.3635	86.41893	n = 27
	within		2.956174	67.56668	83.43613	T-bar = 18.6429
<i>unempl</i>	overall	7.789464	4.146086	1.8	27.2	N = 560
	between		3.369221	3.64	16.74	n = 28
	within		2.494837	-5.505362	22.24946	T = 20
<i>infl</i>	overall	2.907487	3.920998	-4.479938	28.77661	N = 560
	between		1.910132	0.080999	8.574297	n = 28
	within		2.823246	-5.889125	25.1058	T = 20

Source: Authors' own calculations.

Tab. C. Descriptive statistics of discrete variables

Variable	Value	Overall		Between	
		Frequency	Percentage	Frequency	Percentage
<i>soclo</i>	0	440	78.57	22	78.57
	1	120	21.43	6	21.43
<i>scanlo</i>	0	479	85.69	24	85.71
	1	80	14.31	4	14.29
<i>frlo</i>	0	400	71.43	20	71.43
	1	160	28.57	8	28.57
<i>englo</i>	0	460	82.14	23	82.14
	1	100	17.86	5	17.86
<i>gerlo</i>	0	460	82.14	23	82.14
	1	100	17.86	5	17.86
<i>centr_ideology</i>	0	464	82.86		
	1	96	17.14		
<i>left_ideology</i>	0	361	64.46		
	1	199	35.54		
<i>right_ideology</i>	0	295	52.68		
	1	265	47.32		

Source: Authors' own calculations.