Time series evidence on union densities in European countries†

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Abstract

We follow a business cycle approach to study the determinants of union density, finding evidence of negative effects of labour market slack (proxied by unemployment) and some impact of compositional effects (negative impact of increased labour market participation, as measured by the employment rates, and positive effect of educational attainment in the population, as measured by the population with secondary degrees or more). For a subset of countries we also show that the sectoral changing composition (decline of industry and increase in private services) and increased flexibility in the labour market (as measured by temporary workers) have an adverse effect on density. This pattern is common to all 14 European countries under analysis, with national variations due to inflation rates, wage shares on value added, unemployment subsidies and government political orientation. However Nordic countries distinguish themselves from the common pattern in that they exhibit a positive long-term relationship between union density and unemployment. This may possibly be explained by the fact that Nordic unions provide services to unemployed workers (the so-called Ghent system: mainly administration of unemployment benefits, but also job counselling and general training). The general model is robust enough to appear even when we consider Europe as a single labour market and aggregate national membership as if it were a single union.

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3.1 Introduction

From an economic perspective, a trade union can be seen as a coalition of workers providing a 'rent sharing device' through bargaining with its counterparts. The outcomes of bargaining activity extend from wage premium over the competitive wage, to wage differential compression, to insider protection against layoff risks, up to training and productivity enhancing.[1] From a social point of view, unions provide the 'voice' channel to labour movements, offering the social representation of societal values like solidarity and democracy.[2] But and above all a trade union is an organisation that provides private and collective goods in exchange for monetary (and non monetary) rewards. In this perspective, when one is interested in the role of unions, one cannot help looking at union density, defined as the fraction of potential membership (usually the dependent employees) that is effectively unionised. This is due to two main reasons: the first one is that membership is a significant source of funds for union activity; the second is that union density is correlated with workers' endorsement of union actions. For both reasons union density is often taken as a proxy for union bargaining power.[3] It could also be considered as a pre-condition for wage bargaining co-ordination, on the ground that you cannot co-ordinate workers' wage claims unless you are not somehow organising them.[4]

Thus we believe that the determinants of union density are worth investigating, since they provide indirect evidence on the evolution of the demand for 'union services' (like generalised wage increases, wage compression, employment protection and/or layoff insurance funds). Looking in a temporal perspective, we can analyse how this demand has evolved and keeps on evolving, and we can speculate on future evolutions. Data are available on a cross country base only for the most recent decades, whereas unionisation is an already secular phenomenon in most European countries. Thus events that may appear 'stylised facts' on a 30 year basis could reveal incidental occurrence when extending the angle of view.[5] However we have thought it worth reporting what existing data tell us on the determinants of union density in Europe in the last four decades, especially for we can take into account how compositional effects related to labour market reforms may have affected recent trends.

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[1] Beatrice and Sydney Webb give the following definition: 'A trade union, as we understand the term, is a continuous association of wage earners for the purpose of improving the conditions of their employment.' (quoted from Ebbinghaus and Visser 2000, pg.8). Good reviews of the economic impact of unions can be found in Pencavel 1993, Booth 1995 and Blanchflower 1997.

[2] A wider discussion of this issue in Ebbinghaus and Visser 2000, ch.1.

[3] See McDonald and Suen 1992, where they infer a measure of union power from actual wage dynamics, and show the correlation between this measure and both density and unemployment measures. However, when the degree of union coverage is rather different from union density, it is questionable to proxy union power with membership.

[4] This is true as long as the 'logic of membership' and the 'logic of influence' are correlated: see Ebbinghaus and Visser 2000, ch.2.

[5] For example Booth 1983 analyses British union density over a lengthy time span (1895-1989), where two long-term cycles can be observed.

3.2 Theoretical models on union density

In the literature we find several models predicting positive union membership. The main problem faced by this literature is how to solve the paradox of free riding when membership is costly and the results of union activity are available to any worker at no cost (i.e. unions provide collective goods). One line of research has followed the so-called *social custom* approach. If unions provide monopolistically a reputation for 'good societal values' (like being supportive), and a good reputation is valuable for workers, one may expect positive density rates in equilibrium even without resorting to workers' heterogeneity (Booth 1985). When workers are differentiated according to the value they assign to reputation, one can derive threshold effects and can jointly determine union density and bargained real wage. In addition pro-union legislation and lower membership dues increase equilibrium union density (Naylor and Cripps 1993). If we consider strategic incentives to unionise, firm managers and union activists obviously have opposite goals: as a consequence, equilibrium union density is affected by the dimension of the workers' surplus and by the degree of bargaining centralisation (Naylor and Raaum 1993, Corneo 1995). Finally, if we consider that the reputation enjoyed by a worker if a function of the size of 'believers' (Akerlof 1980), we may obtain either positive or negative impact of pre-existing density on the individual decision to join, according to the dominance of 'conformist' or 'elitist' attitude among workers (Corneo 1997).

An alternative line of research has considered the possibility of unions providing private goods to their members, especially in terms of employment protection. When unions are able to bargain over layoff procedures and to obtain preferential treatment for their members (in that non union members are the first to be laid off), workers join the union in order to obtain (partial) insurance against the unemployment risk. If they are heterogeneous in terms of risk aversion, more risk averted workers join the union and, other things being constant, an increase in aggregate unemployment risk raises union density (Booth 1984).[6] When the labour demand has an erratic component, and firms follow a last-in first-out rule in layoffs, membership increases with past employment, because seniority rules are applied in union voting as well (Burda 1990, Grossman 1983). Also in this framework, an exogenous shock to employment probability lowers the value of union insurance, thus decreasing the expected gain of becoming a union member (Jones and McKenna 1994). Finally, if in addition to employment protection and wage differential compression unions provide a higher probability of on-the-job training, less skilled workers are more likely to unionise (Agemoglu, Aghion and Violante 2000). Whenever unions offer exclusive services to their members, e.g. in the form of advice on retirement plans and legal support in disputes with employers, union density is obviously increasing with the quality of the services provided (Booth and Chatterji 1995).

Overall, both strands of the theoretical literature provide testable predictions for union density. In the first case, density should be correlated with solidaristic values (no matter how measured), with labour productivity (since it increases available surplus) and with bargaining centralisation. In the second case, membership is correlated with unemployment risk (the sign of correlation depending whether we are considering the firm level or the aggregate one) and labour force composition (since insiders have a comparative advantage in adopting LIFO procedures). Both approaches predict a negative impact of unionisation cost, and this could be extended to include legislative support to union activity at work-place level.

[6] However the *coeteris paribus* assumption is untenable when the joint determination of wage and density is considered: "The two facets of wage setting, the political one and the mechanical, work in opposite directions as membership grows. The political facet has wage increasing to satisfy the preferences of the shifting median voter, whereas the mechanical facet has wage declining as the members willing to work increase" (Booth 1984, p.893). Booth and Chaterij 1995 present a similar model, where membership is increasing in union bargaining power and alternative wage (and therefore negatively related with unemployment).

3.3 Review of empirical results on union density

From an empirical point of view, union density has been studied according to two dimensions: aggregate dynamics (time series analysis) and distribution in a population (cross-section analysis).[7] The first line of research has focused on country studies, revealing some common patterns and some differences. The so-called 'business cycle' approach have highlighted a negative influence of unemployment rates and a positive effect for price inflation, whereas the overall impact of real wage growth, when considered, is ambiguous.[8] Some authors have also introduced compositional variables to account for changes in the labour force, but the results are far from conclusive.[9] More agreement can be found on the impact of favourable labour legislation on union density.[10]

Evidence from individual data is less controversial. Blanchflower (1997) makes use of 40.000 observations collected in 1989-92 on European workers to prove that unionisation is positively and non-linearly related with age (with a probability peak at the age of 45) and is more likely for men, employed full-time in manual work. Part-timers are less likely to unionise, but unionisation increases with hours worked.[11] Public employees and workers in the industrial sectors are more likely to unionise, whereas the educational attainment is found irrelevant.[12] Environmental variables (proxied by the density rate at the firm or sector level) seem to play a significant role.[13] In the end, leftist voting and/or being member of a left-wing party is usually strongly correlated with being a union member, because the two decisions are probably jointly determined.[14] Finally, some studies have also considered firm-level data, finding evidence of the positive effect of local unemployment rates, whereas the wage premium seems irrelevant.[15]

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[7] In principle, panel samples represent a suitable combination of both approaches, and it could be able to ascertain whether compositional or business cycle effects are the main causes of density changes. In practice, similar data set do not exist. A panel analysis can be conducted using data at firm level (see Andrews and Naylor 1994).

[8] On British data Booth 1983 and Carruth and Disney 1988 find a negative impact of unemployment rates whereas Freeman and Pelletier 1990 find a positive one for the same country. A positive sign for the unemployment rate is also found for Finland (Pehkonen and Tanninen 1997) and for West Germany in the long-term (Carruth and Schnabel 1990), whereas a negative sign is obtained for Italy (Checchi and Corneo 1996, via the definition of worker surplus). All three studies on British density obtain a positive sign for price inflation, but in the first two cases wage inflation is also considered; as a consequence "… on balance we might expect a negative relationship between union membership and the changes in the real wage" (Carruth and Disney 1988, p.6). On the contrary, a positive effect of real wage is obtained for Germany and Italy.

[9] Freeman and Pelletier 1990 conclude that aggregate British union density in the period 1945-1986 was positively affected by the manufacturing share of employment. Pehkonen and Tanninen 1997 estimate an equation for the Finnish union density using aggregate data for the period 1962-1992, and find a negative impact of the agricultural component in the labour force.

[10] Freeman and Pelletier 1990 show the significance of a "legal index" measuring the attitudes towards the unions of the government in place. Pehkonen and Tanninen 1997 use a step-variable measuring the change in the pro-union attitude of the government. Checchi and Corneo 1996 use a step-variable to control for the introduction of a worker charter favouring unionisation at workplaces.

[11] Van den Berg and Grift 1998 analyses three surveys conducted on Dutch workers in 1979, 1987 and 1995, and find positive effects for a male dummy, for age and education, whereas religious beliefs decline in importance.

[12] The educational attainment is found significant in public sector unionisation in another sample of 150.000 observations referred to US and UK in two waves (1983 and 1993). Similar conclusions are obtained in Card 1998 with respect to CPS surveys conducted in US in 1973 and 1993

[13] Working on British (from BHPS) and German (from GSOEP) data, Goerke and Pannenberg 1998 find positive effect of sectoral density rates interacted with spouse/partner status (the partner being a union member in the German data-set, the partner voting for left-wing parties in the British data-set) on the probability of joining a union.

[14] See Riley 1997.

[15] Blanchflower and others 1990 find evidence of local unemployment positive impact. Booth and Chatterji 1993 and Corneo and Lucifora 1997 find that plant level union density is independent of the bargained wage (respectively using British and Italian datasets).

On the whole, an analysis based on individual observation may help to predict the possible impact of compositional changes in the potential membership: increasing white collar jobs, more and more held by better educated women, can be detrimental for union density. However, careful analysis of compositional changes indicates that the portion of variance explained by these factors is limited.[16]

3.4 Empirical evidence on European union density rates based on aggregate data

The data utilised in the present analysis have been collected with the main concern of comparability across fourteen European countries.[17] Even when national sources provided longer series, we have preferred to stick to international ones. Union density rates are taken from Ebbinghaus and Visser (2000): when available, net density rates (excluding members who are unemployed or retired, computed on dependent employed workers) have been preferred.[18] Union density rates are presented in figure 1 The augmented Dickey-Fuller tests (country by country, 1 or 2 lags, with and without time trend) indicate that these series are all non stationary, and therefore we will consider first differenced variables (see figure 2).[19] In addition, normality tests indicate normality for the first differenced variable. The potential existence of cointegrating relationships allows us to represent the data generating process as an error-correction mechanism, thus allowing the distinction between short-term effects and long-term determinants.[20]

The survey of existing literature suggests alternative explanations of the dynamics of union density, which we group into three categories of available variables.

Business cycle effects
Many authors find evidence of non-zero correlation between the UNEMPLOYMENT RATE (variable UNE)[21] and the density rate. Correlation can exhibit both signs. Traditional explanations suggest a negative correlation, because during booming periods market forces provide wage increases, whereas during recessions employers' bargaining power is strengthened, and they are more likely to reject any union's request (Booth 1983). However, when protection reasons prevail (either because unions administer unemployment benefit schemes, as in the so-called "Ghent system", or because workers believe that the status of union member is associated with a lower probability of lay-off), correlation could be positive.

An additional indicator for cyclical variations is the INFLATION RATE of the CONSUMER PRICE INDEX (variable INFL)[22], which in some country studies exhibit a positive correlation (Carruth and Disney 1988, Carruth and Schnabel 1990, Freeman and Pelletier 1990). The usual explanation invoked here is the 'insurance motive': with rising inflation, workers become more unsure about the sustainability of

16 For example, Green 1992 examines British density in 1983 and 1989, finding that compositional effects (gender, full/part-time, age composition and firm size) on the whole account for only 30% of the union decline registered in the same period.

17 The countries are Austria, Belgium, Denmark, Finland, France, (West) Germany, Great Britain, Italy, Ireland, Netherlands, Norway, Spain, Sweden, Switzerland.

18 For five countries it was necessary to resort to gross density rates (i.e. including members who are not active workers): Great Britain, Ireland and Switzerland (for lack of a better alternative), Denmark and Spain (for a longer time span).

19 The use of first differenced variables eliminates the problem of non stationarity (in all cases but two, Italy and Switzerland – tests statistics available upon request) and avoid the use of logistic transformation in order to obtain normally distributed residuals (as done in Booth 1983).

20 See Engle and Granger 1987. For a similar approach see Carruth and Disney 1988 and Carruth and Schnabel 1990.

21 Unless otherwise indicated, all aggregate macro-variables have been extracted from OECD Statistical Compendium 1998/2.

22 In the case of Denmark, the CPI index has been extracted from the OECD Main Economic Indicators data-set.

the real value of their earnings, and join the union to protect it better. The same kind of mechanism could operate through a decline in real wage growth: in such a case we should expect a negative correlation between this real wage growth and union density. However, if the decision of the individual worker to join a union is viewed as a sort of 'reward' to the union in exchange for its success in wage bargaining, we should expect a positive correlation instead (Checchi and Corneo 1996). We have preferred to disentangle this last effect using the WAGE SHARE on VALUE ADDED (variable WASH).[23]

Compositional effects

Time series analysis is not the most appropriate tool to investigate the potential existence of compositional effects determining the evolution of union membership. Individual data seem more appropriate to accomplish this task. Within a literature based on individual data, there is wide consensus about the fact that male manual workers have a higher propensity to unionise. More recent evidence indicates that the educated female component of public employees also has high density rates (at least in relative terms). In addition, full-time adult workers have higher density rates than young part-timers (see Blanchflower 1997). In order to control for these effects using aggregate variables, we have first considered the PARTICIPATION RATE (variable PART), on the ground that an increase in this variable entails the appearance in the labour market of individuals (women and young workers) with lower inclination to unionise (thus expecting a negative correlation). On the other hand, the dynamics of this variable is affected by the presence of discouraged workers. This suggests the use of an interrelated variable, the EMPLOYMENT RATE (variable EMPL, with the male variant, MEMP, and the female one, FEMP) that avoids the problems. Our expectation is that, other things being constant, an increase in the employment rate implies the entrance in the labour market of more women and young workers.[24] Given the fact that these people are more likely to be employed in non-standard employment contracts (part-time, temporary jobs), they are less likely to unionise:[25] as a consequence, we expect a negative correlation between employment and density rates. As we will see in the sequel, when we have information on the AGE COMPOSITION (variable YOUNG, corresponding to the share of employees younger than 35) and on the TEMPORARY CONTRACTS (variable TEMPOR, indicating the share of temporary employed in total dependent employment), we can directly control for this effect, and this will make the EMPL effect vanish.

Whenever data were available, we have tried to isolate single compositional effects: we have experimented with the GENDER COMPOSITION of the employment by considering the dependent employment share of women (variable GENDER). We do not have an apriori expectation on the sign of this correlation: in addition to the different degree of employment stability and duration, female unionisation can be affected by the perception of union's goals as 'male-oriented' or not.[26] We have also considered the sectoral composition of the dependent employment. The INDUSTRY SHARE IN DEPENDENT EMPLOYMENT (the variable IND) can be taken as a (admittedly weak) proxy of the manual/non manual ratio in the labour force, whereas the PUBLIC EMPLOYMENT SHARE (variable PA) takes into account the absence of managerial opposition to unionisation. In both cases, we expect a positive correlation with union density.[27] If considering strategic incentives, it is likely that high rent

[23] This variable has been computed as the ratio of 'compensation of employees' to 'value added at market prices', both evaluated at current prices in local currencies.

[24] Especially in Southern European countries, where participation rates are lower than the corresponding rates for Nordic countries: with a European average for the female participation rate in the 90's of 0.39 (entire population), Italy has a value of 0.30, Spain (and Ireland) of 0.28.

[25] Irregular working hours hinder trade union recruitment efforts and reduce communication with colleagues, which in turn may reduce any sense of shared interests at the workplace. See Riley 1997.

[26] Gender specific density rates are available for seven countries. For four of them the male rate is higher than the female one (West Germany, Austria, Netherlands and Switzerland); in two case the reverse situation applies (Sweden and Ireland). Finally, in the case of Great Britain, the huge decline of the former rate has put the two rates in line.

[27] Gender disaggregation of these variables did not reveal additional information when introduced in regressions.

sectors provide greater incentive to unionisation because the rent premium that can be captured by collective bargaining is higher. To control for this effect we have considered the (dependent) EMPLOYMENT SHARE IN NATURAL MONOPOLY (variable MON), by taking into account the energy-gas-water and transport-telecommunications sectors.[28] If we want to take into account the precariousness of the employment relationship, in addition to the share of temporary employment we could also consider two indirect measure of this effect: the PRIVATE SERVICE SHARE IN DEPENDENT EMPLOYMENT (variable SE) and the SELF-EMPLOYMENT SHARE IN TOTAL EMPLOYMENT (variable INTO). In both cases we expect an unfavourable effect on unionisation.

We also want to control for the skill distribution in the labour force, especially when considering the enormous changes that have occurred in educational achievements in the aftermath of World War II. In principle, this information is collected only in census years. However, we have made use of the estimates provided by Barro and Lee (1996). Starting from a census year, these estimates are updated using enrolment rates by the permanent inventory method. Unfortunately these estimates have been constructed on a quinquennial basis. In order to obtain values for the intermediate years, we interpolated existing observations making use of a polynomial of time (up to the fourth power). A measure is thus accessible: the POPULATION SHARE (in the 25-64 age group) WITH SECONDARY SCHOOL or COLLEGE DEGREE (variable FHC), which is the sum of the population share with secondary school degree and the population share with college degree, both obtained with the above-mentioned procedure. Once again we do not have an apriori expectation of the correlation with density. On one side, an increase in the educational attainment yields an increased bargaining power to the single worker that has achieved it, thus making individual bargaining more desirable, and providing an incentive to abandon the collective bargaining provided by unions.[29] On the other hand, when the increased educational attainment is generalised, collective bargaining may remain viable, and unions still provide useful services to accomplish it. In addition, increased education calls for recruitment of additional teachers, which traditionally is a highly unionised sector.

Political attitude effects

It has been stressed that institutional factors are relevant in creating incentives and obstacles to unionisation. A first factor that immediately comes to our mind is the degree of flexibility in the labour market.[30] In terms of unionisation, we expect non-standard employees (including part-timers) to be harder to unionise, because they are less frequently on the work place, are more vulnerable to the risk of unemployment and/or may express less attachment to their job-mates. Regrettably, the series for non-standard employees are available only for most recent years and not for all countries.[31] As a consequence, we could compute the NON-STANDARD EMPLOYMENT SHARE (variable PARSH) on a very limited range of country/years, making this variable almost unusable in the regression analysis. Greater time span is offered by the share of temporary worker (available since 1983 for 9 countries and since 1995 for 3 countries), which is one possible measure of the degree of flexibility of the labour market.

In search for alternative route to address the problem of institutions, we have looked at the political orientation of policy making. While this can rather easily be done on a country by country base,[32] it is

[28] Unfortunately, compositional variables based on sectoral dependent employment are not available on a cross-country comparable basis for four countries (Denmark, Ireland, Netherlands, Austria).

[29] Agemoglu and others 2000 indicates as one of the potential explanations of the decline in unionisation the skill-biased technological change, in that it provides an incentive to more productive workers to move to individual bargaining.

[30] See Nickell 1997 and Blanchard and Wolfers 2000 for alternative measures of labour market institutions.

[31] The most recent issue of OECD Main Economic Indicators report the absolute number of part-timers and non-standard employment for the following countries (in brackets the starting year): Belgium (1988), Germany (1991), Ireland (1980), Netherlands (1989), Norway (1992), Spain (1988), Switzerland (1992) and Sweden (1987).

[32] Freeman and Pelletier 1990 show a positive effect of a legal index measuring the attitudes towards the unions of the government in place in Great Britain. Pehkonen and Tanninen 1997 find that a step-variable measuring the change in the

more difficult to provide a comparable index across countries. We have experimented with two variables: a first variable indicates the POLITICAL ORIENTATION of the EXECUTIVE GOVERNMENT in office (variable GOVN, taking the value +1 when a pro-labour government is in office, -1 for a conservative government and 0 for all the cases which do not fit into the previous two categories).[33] A second variable that captures the extent of social protection, with special reference to the unemployed is the REPLACEMENT RATE (variable BENEFIT).[34]

But social attitudes could be relevant as well, as we have learnt from the social custom approach to unionisation. Since we could not think of good proxies measuring solidaristic values at the aggregate level on a comparative basis, we have resorted to STRIKE PARTICIPATION as an indirect measure of 'conformist behaviour' among the workers (variable SPART).[35] In principle this variable should display a high correlation with density, as long as mainly union members respond to strike calls of the union. However, when the coverage extends to non-union members as well, all workers may feel involved in general issues (pension schemes, indexation, etc.) and therefore respond to calls for strikes. In such a case, strike participation is measuring the degree of popularity of union goals in the working population. However in some institutional contexts, this variable captures other aspects, like resources available to unions, adversative or co-operative attitudes in bargaining, legal framework for strike activity, so that we do not rely excessively on this variable.

All variable means are reported in Table 1 (available samples), and pair-wise correlation and available observations are reported in Table 2. Just looking at correlation coefficients (see the first column of Table 2), union density seems negatively associated with unemployment rate and positively with inflation rate and wage share on value added. As a result, business cycle explanations of union density should not be contradicted by our data. More controversial evidence appears when we consider compositional effects. Employment rates seem positively correlated with union density, as is the case for the female component.[36] However these could just be spurious correlation, and multivariate analysis is required to ascertain the validity of this evidence. More straightforward is the finding of a positive correlation with public employment share, whereas it is counterintuitive to find a negative correlation with industry share and a positive one with private service share. Negative correlation, as expected, is found with temporary contracts share and age composition of the employees. Additional evidence that requires further investigation is the positive correlation between the skill level in the population and union density, which turns out to be positive. Finally, while there is low correlation with a government's political orientation, its pro-unemployment attitude is captured by the level of replacement rate. On the contrary, strike participation does not exert a significant impact on unionisation.

It is necessary to move on to multivariate analysis. We start with a country level analysis, trying to assess the existence of regularities across countries. Subsequently we treat the whole sample as an

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pro-union attitude of the government has a positive impact on union membership for Finland. Checchi and Corneo 1996 find an analogous effect for Italy when considering the introduction of a workers' charter of rights.

33 This information has been kindly made available by Patrick Walsh, Development Research Group, The World Bank. A full account of the methodology of construction of this data-set covering the period 1975-95 is in Beck and others 2000. The variable GOVN corresponds to the original variable EXERLC.

34 It includes both unemployment benefits and social assistance benefits, and has been created as from a weighed average of the average production worker wage and 2/3 of it. The source is the OECD Data-base on Benefit Entitlements and Gross Replacement Rates.

35 This variable corresponds to the ratio of workers involved in strikes (source: ILO Statistics) and dependent employment. For countries where the latter information was absent (Austria, Denmark, Ireland, Netherlands, Switzerland), total employment was used as denominator.

36 Visser in OECD 1991 was already sceptical about gender based explanation of the decline in union membership in Europe.

unbalanced panel of observations. Finally, we will aggregate the data across countries and study the 'European' density rate.

In search of a long term relationship between union density DEN and another variable (or a group of variables), say the unemployment rate UNE, we make use of the following formalisation (error correction representation)[37]

$$\Delta DEN_t = \beta_0 + \gamma_1 \Delta UNE_t + \gamma_2 DEN_{t-1} + \gamma_3 UNE_{t-1} + u_t \quad (1)$$

The estimated coefficient $\hat{\gamma}_1$ can be taken as the *short term impact* and the computed value $\left(-\hat{\gamma}_3 / \hat{\gamma}_2\right)$ as the *long term effect* of UNE onto DEN. In addition $|\gamma_2|$ is a measure of the speed of convergence to the long term relationship; $\gamma_2 < 0$ implies convergence, whereas $\gamma_2 > 0$ suggests divergent behaviours. However one may argue that the finding of significant estimates for the coefficient γ_1 cannot be taken as evidence of a causal link running from unemployment to union density, especially when considering the potential endogeneity of the unemployment rate.[38]

We have two alternative routes to deal with the potential endogeneity of unemployment rates: either we lag the right hand side variable (today density is affected by yesterday unemployment, thus preventing reverse causation) or we instrument the right hand side variable (today actual unemployment is replaced by its prediction based on instruments). In both cases this deal with short run impact, since in the long

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[37] If we are in search of a long term relationship between union density DEN and another variable (or a group of variables), say the unemployment rate UNE, we may want to test the validity of the following formulation

$$DEN_t = \alpha_0 + \alpha_1 UNE_t + u_t \quad (N.1)$$

If the equation (N.1) cannot be directly estimated because of non-stationarity of the independent variable, using first differences can overcome the problem.

$$\Delta DEN_t = \alpha_1 \Delta UNE_t + \left(u_t - u_{t-1}\right) \quad (N.2)$$

However equation (N.2) represents a *short-term relationship* between DEN and UNE, which constitutes a good approximation if and only if the two variables do not deviate excessively from their *long term steady-state (equilibrium) relationship*. On the contrary, when some dynamic adjustment is added to equation (N.1), as for example

$$DEN_t = \beta_0 + \beta_1 UNE_t + \beta_2 DEN_{t-1} + \beta_3 UNE_{t-1} + u_t \quad (N.3)$$

it can be rearranged as in the error correction mechanism representation (See Harvey 1981)

$$\begin{aligned} \Delta DEN_t &= \beta_0 + \beta_1 \Delta UNE_t + (\beta_2 - 1) DEN_{t-1} + (\beta_3 - \beta_1) UNE_{t-1} + u_t = \\ &= \beta_0 + \beta_1 \Delta UNE_t - (1 - \beta_2) \left[DEN_{t-1} - \left(\frac{\beta_3 - \beta_1}{1 - \beta_2} \right) UNE_{t-1} \right] + u_t \end{aligned} \quad (N.4)$$

or using a more compact notation

$$\Delta DEN_t = \beta_0 + \gamma_1 \Delta UNE_t + \gamma_2 DEN_{t-1} + \gamma_3 UNE_{t-1} + u_t \quad (N.5).$$

[38] Both Nickell 1997 and Blanchard and Wolfers 2000 put the unemployment rate on the left hand side and union density on the right hand side. However, both papers raise the doubt on whether unemployment is more affected by union coverage or union density.

run we can only assess whether the two variables are related, without identifying a direction of causation (namely, we can assess whether there exist fixed ratios among the variables). Under the first alternative, which is our preferred strategy, the general form of the estimated model is

$$\Delta DEN_t = \beta_0 + \gamma_1 \Delta UNE_{t-1} + \gamma_2 DEN_{t-1} + \gamma_3 UNE_{t-1} + u_t \quad (2a)$$

where the first difference of UNE has been lagged one year. The alternative route is to replace the same variable with its prediction based on instrumental variables. We have experimented with this alternative in panel estimates. A potential instrument must be correlated with the endogenous variable but not with the exogenous variable, and must be orthogonal with the error term. In the sequel we have experimented with three possible instruments: the rate of change of (real) public consumption expenditure (expected to be correlated with employment), the rate of change of the population (expected to be correlated with unemployment) and the participation rate (expected to be correlated with unemployment and employment rates). In this case the general form of the estimated model is

$$\Delta DEN_t = \beta_0 + \gamma_1 \Delta \hat{UNE}_{t-1} + \gamma_2 DEN_{t-1} + \gamma_3 \hat{UNE}_{t-1} + u_t \quad (2b)$$

where $\hat{UNE}$ represents the projection of UNE based on alternative instruments.

3.4.1 – Individual country estimation

We start our discussion with country by country estimates, making full use of all available information. The estimated models are reported in Table 3a-3b-3c. As can be easily imagined, it is almost impossible to ascertain common patterns at this level, because the same variable bears the expected sign in some countries but not in others. For this reason, we have tried to group the countries in accordance with the level and the trend of union density: a first group of "high density" countries (Finland, Belgium, Sweden, Denmark, Norway, Austria), a second group of "intermediate density" countries (Netherlands, Italy, Ireland, Great Britain, (West) Germany, Switzerland) and a "low density" group (composed by France and Spain only).[39]

Looking at the first group of "high density" countries, we find evidence of the traditional role played by business cycle components in the short-term: negative impact of unemployment and positive impact of inflation. What is more unexpected is the long term positive correlation between union density and unemployment rates for a group of countries (Sweden, Denmark, Norway and Austria). This is more surprising when we observe that in the second and third group of countries the unemployment rate plays a long-term negative role in all cases but two.[40] A potential explanation of this result could be related to the so-called Ghent system:[41] whenever unions are in touch with unemployed workers (either

[39] This grouping corresponds to the trends of union densities.

[40] There is evidence of a positive effect in the long-term for the case of Great Britain, but its significance in negligible. A different case is the Spanish one, where over the narrow sample available (14 years) unemployment and density are positively related, but the latter variable could not help but rise, given the previous dictatorship.

[41] "Only in a few European countries has the 'Ghent system'—with the state providing supplementary means to a union-funded and union-controlled unemployment scheme—survived the shock of the Great Depression of the 1930s. Elements of that system have been retained by the Danish and Swedish unions, and were reintroduced in Finland in the late 1960s. In other countries where it had been operative, for instance, in Norway, the Netherlands or Britain, these systems were replaced by mandatory state schemes. In Belgium, where the Ghent system originated, it was also discontinued but unions still hold on to an administrative role in processing individual benefit cases for their members, thus giving them the possibility of providing preferential treatment (and a highly selective benefit) to members in good standing" (Ebbinghaus and Visser 2000, p.14-15).

because they administer unemployment benefits or provide direct assistance to them), density rates do not necessarily decline with increased unemployment.[42] Further support in this direction comes from the replacement rate BENEFIT as a proxy of government attitude towards the unemployed: it comes out positively associated with union density in three cases out of seven (Sweden, Norway and Austria), all in the first group of countries. Rather similarly, while employment rates exert a negative impact in the long-term for the majority of countries, they are positively related to union density in some countries of this group (Sweden, Denmark and Norway). Notice that the measured impact reaches significant values: a one percent increase in the unemployment rate translates into one-two additional points in union membership for some "high density" countries (Austria displaying much higher values, due to the imprecise estimate of the coefficient on DENL1), and into an opposite variation for "intermediate density" countries.

When we look at the other variables, the representation that emerges is far more homogenous. Among the *business cycle effects*, the inflation rate exerts a short term positive impact in five cases out of nine,[43] whereas the wage share has a constant negative impact when significant (five cases).[44] Similarly, some *compositional effects* vary significantly across countries: an increase in the female component of employment lowers union density in Belgium, Italy and Switzerland, but is beneficial to unions in Sweden and Germany. Even less interpretable are the signs of the other variables (industrial share IND and public employment share PA), that are significant in some cases but not in others.[45] Even the educational attainment at secondary level (or above) in the population has variable impact: is exerts a positive influence in some countries (Finland, Belgium, Denmark and Italy), but negative in others (Norway, Britain and France).

Also in the case of *political attitude effects* we do not find univocal patterns. The political orientation of the executive (which can be taken as a proxy of the political climate) bears a positive sign in all cases but two. This suggests that a government's pro-labour attitude can significantly help unions in raising density, and conversely conservative governments may impede unionisation.[46] However, in the case of the two countries exhibiting negative signs (Italy and Germany) an alternative explanation could be at hand. These two countries experienced long periods of conservative (Christian-Democrat with various allied parties) governments, and yet the presence of these conservative governments seems to have raised union density. A possible explanation has probably to do with a "moral" effect in the rank-and-files: since conservative governments are expected to reform welfare and labour market institutions in a pro-market direction, unions revitalise in opposing such measures, and this raises union density. Finally, strike participation comes out significant in eight cases, but with alternating signs that cannot be attributed to a general interpretation.

Diagnostic statistics are satisfactory, especially when one takes into account that we are not making use of any dummy variable to account for institutional change. The predictive ability of the model is rather good even when analysing first differences, as can be judged from Figure 3.

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[42] A theoretical analysis of the incentive to density provided by government subsidised unemployment insurance schemes is offered by Holmlund and Lundborg 1999.

[43] These five countries are Finland, Norway, Italy, Great Britain, and France, while the negative correlation is obtained for Denmark, Netherlands, Switzerland and Spain. This raises some doubts about the generality of the conclusion by Freeman and Pelletier 1990 about the existence of an "insurance motive" explaining the positive correlation with the inflation rate.

[44] Here again reverse causality may be at work, though a theoretical expectation would be for a positive sign. However this has to do with the assumption concerning technology and union preference: see the discussion in McDonald and Suen 1992.

[45] The employment share in natural monopoly (variable MON) is never significant altogether.

[46] It is interesting to observe the high t-statistics associated with this coefficient in the British case, where trade unions crashed after the Tatcher treatment after 1979.

Summing up, we have found that the main determinants of union density in European countries are to be looked for in cyclical components and in the political game, whereas compositional effects are more controversial. Within the cyclical component, we uncover two types of behaviour. Within most of the "high density" countries, labour market participation (either as employed or unemployed) has beneficial effects on union density. The same countries have therefore recorded soaring trends for membership in recent decades. In the "intermediate density" countries the opposite situation occurs: youth unemployment and greater labour market participation are associated with declining membership. We have also to take into account that unions are "political animals", that react to the political climate: when anti-labour reforms are at issue, they mobilise and, if successful, gain more members in reward for their action. On the contrary, in case of defeat, union membership declines.

3.4.2 – Panel estimation

The main weakness of the previous model is due to the shortage of degrees of freedom for each country. In search of a common unionisation pattern we have pooled all the available information, taken as an unbalanced panel. A fixed effect model estimated over the available time span (mainly the period 1961-1995) is reported in Table 4. A fixed effect estimation has been preferred to a random effect alternative, because single country estimation has shown rather different behaviours. In addition, other institutional features (like the role and relative importance of firm-level union organisation) could not be controlled for.[47] Using the fixed effect model we dispense for persistent differences affecting the levels of density, and concentrate on common patterns of dynamics.

The *business cycle effect* is mainly captured by the unemployment rate UNE, which exerts a negative short-term impact on density. The inflation rate INFL (second column) comes out as insignificant, while the wage share WASH has been excluded at this stage because it is not available for all countries. The *compositional effect* is taken by the employment rate EMPL, which in turn exerts a negative short-term impact.[48] Thus we find partial corroboration of the expectation that the propensity of new entrants in workplaces to unionise is lower (see next paragraph for deeper discussion). When the educational attainment is taken into account (variable FHC in third column), in the short-term it contributes with a positive sign. Leaving aside differences in educational attainment across countries,[49] this effect can only be explained by the better educational background of new entrants, and it provides an opposite indication to the EMPL variable one. Jointly taken, the compositional variables suggest that better-educated new entrants have a higher propensity to unionise, whereas below-the-average education workers tend to unionise at a lower rate than pre-existing workers. If the non-standard employment contracts are more represented among the latter group of workers, this would indicate that unions are losing support among the group of low-skill workers, which in previous periods were among the core of the rank-and-file. Finally the *political attitude effect* is hardly described by the political orientation of the executive (variable GOVN in fifth column) or strike participation (variable SPART in fourth column), whereas it finds negligible positive evidence when measured by the replacement rates (variable BENEFIT in sixth column). The dynamics is stable, but with a very low speed of adjustment (see the coefficients on DENL1).

But the strongest effects are produced by labour market variables. Both the unemployment and the employment rates exhibit a negative impact onto union density, both in the short-term and in the long-

[47] Hanke 1993 argues that different trends in density rates could account for the different role of workplace organisation, because it is the local union that is accessible to the single worker, offering grievance and membership services. Waddington and Whiston 1997 argues that recruitment practices by unions are relevant determinants of the reasons why people join (or refuse to join) a union.

[48] The employment rate EMPL was preferred to the participation rate PART on the grounds of goodness of fit.

[49] These differences were still rather pronounced, even in the 90's: the population share with secondary degree or more is 79% in Switzerland, 60% in Norway and 45% in Italy or Spain.

term (whereas the levels of all the other lagged variables remain insignificant, and are not reported). Therefore the dynamics of union density in European countries seem to respond negatively to two types of shocks: rises in unemployment rates (due to oil shocks, fiscal discipline induced by monetary convergence) and increased participation in the labour market (mainly by part-timers and temporary workers). However this picture is not as homogenous as it appears at first glance. As suggested by the Hausman specification test, the estimated relationship is mis-specified, because imposing the same dynamics with regard to long-term effect is effectively rejected by the data. For this reason, we have interacted the lagged variables with country dummies, and have retained the statistically significant ones. By including these coefficients in the calculation of long-term relationship for the countries concerned, it comes out that Denmark and Great Britain exhibit positive relationships between union density and unemployment (with a computed coefficient of 2.16 and 2.96 respectively – value referred to the sixth column), whereas the negative effect is attenuated for the Netherlands (coefficient equal to –0.90). This is related to previous results concerning the role played by unions in the Ghent system: when unemployment insurance institutions give a pivotal role to union, membership is expected to rise notwithstanding high unemployment. The predictive ability of this general model is rather good: in addition to R^2 measures, one may have a visual inspection by looking at Figure 4.

It is important to stress that the estimated model dispenses for country specific effects affecting the means of the variables, but imposes a common pattern of dynamics across all the sample countries. Thus in all European countries (except Denmark and Britain) a long-term increase in unemployment reduces union density, with an estimated elasticity of –0.74 (at sample means, using the last column). This value seems rather excessive: with a country average unemployment in Europe of 4.4% before 1980 and 9.9% afterwards, this should be responsible for an average decline in density of about 29 percentage points ! However, since the long-term measure depends on the estimated coefficient for DENL1, we believe that the imposition of a common speed of adjustment does not fit the data (as witnessed by the Hausman test). Whenever we allow for different speeds of adjustment (as we do for Denmark, Britain and the Netherlands) we find lower values; repeating the experiment for all countries we find that most of them have a lower estimated coefficient for DENL1. Thus we believe that the true elasticity of union density with respect to unemployment rate is lower that that obtained by panel estimates (as can be inferred by comparing country by country estimates with panel estimates, as done in table 6 that summarises the evidence obtained in table 3 and 4). We are also reassured in this claim by noticing that the short-term impact of unemployment is much lower (estimated elasticity of –0.02 at sample means – sixth column). Similar effects are produced by an increase in the employment rate: the short-term elasticity is –0.20, while the long-term one is much higher –1.27.

One would like to speculate on future evolution of union density. Leaving aside the specificity of Denmark, Britain and the Netherlands, our estimated long-term relationship that is common to all countries is the following

$$DEN_t = \beta_0 - 4.85 \cdot UNE_t - 1.36 \cdot EMPL_t = (\beta_0 - 4.85) + \left(\frac{4.85}{PART_t} - 1.36 \right) \cdot EMPL_t \qquad (3)$$

By exploiting the relationship between participation rate, employment rate and unemployment rate (namely $EMP = PART \cdot (1 - UNE)$), equation (3) indicates that union density is intrinsically related to the evolution of the labour demand and the labour supply. For constant participation rates, an increase in employment rates raises union density because it obviously reduces unemployment. On the other hand, if participation is correlated with employment (discouraged workers), a rise in employment rates lowers density. A combination of the two movements (say a rise in the employment rate of one percentage point accompanied by a reduction in the unemployment of similar magnitude) produces an increase in density.

3.4.3 – Instrumental variables

We have also checked the robustness of our results using instrumental variable estimation. We take the last column of table 4 as reference model, and in table 5 we replicate it using current (first column) and lagged values (second column) for unemployment and employment rates, in difference and in lagged level.[50] The third and fourth columns make use of the rate of change of total population and the rate of change of government consumption at constant prices as instruments; the instrumental variables are taken at current and lagged values, alone and interacted with Denmark dummy variable. The fifth and sixth columns replace the rate of change of population with the (current and lagged) participation rate in the labour force. The result reported in table 5 suggest that unemployment and employment rates exhibit a (contemporaneous) negative impact on density rates, whereas this effect disappear when we consider lagged variations. Among the other regressors, the educational composition of the population and the replacement rate provided by unemployment benefits, the former loses significance, while the latter retains a similar significant coefficient. As far as long run relationship, unemployment and employment rates keep a negative link with density rates, even if the long-run impact lowers for the former variable and increases for the latter. On the whole, it seems that an alternative estimation strategy based on instrumental variables does not contradict our strategy of lagging potentially endogenous variables.

3.4.4 – Compositional effects using panel estimation

In search for a more consistent pattern in compositional effects, we have collected information on the sectoral composition of employment (variables IND, SE, PA and MON), age and gender composition (variables YOUNG and GENDER) and indirect measures of the precariousness of the employment conditions (variables INTO and TEMPOR). The main problem with these analysis is that is restricted to a subset of countries and to more recent years. Since the intersection of non-missing observation cases is rather limited and therefore less significant (56 observations referred to 6 countries), we have preferred to consider two alternative sub-samples. In the first one (reported in Table 7a) we integrate previous variables (unemployment rate, employment rate, educational attainments and unemployment benefits) with gender composition (columns 2 to 6) and sectoral variables (industry share in column2, private services share in column 3, public employment share in column 4, natural monopoly share in column 5 and self-employment share in column 6).[51] One can notice that, while the general model retain its validity, there is additional variation that can be explained by these compositional variables. If we look at the increase in the R^2 coefficient from the first column (where compositional variables are excluded) to the other columns, we notice that at best the compositional effects explain an additional 5% of the (within) variance. The female component in the dependent employment shows a positive sign, thus indicating that women per se do not have a lower propensity to unionise, but their propensity is intertwined with both the sector of employment and the employment opportunity they get. With respect to sectors, industrial employment is positively correlated, and, conversely, private services employment is negatively correlated (but weakly significant). It is rather surprising to find a negative sign for the public employment variable. Employment in 'natural monopoly' sectors (energy-gas-water-transport-telecommunications), that lie in between industry and services, show a strong and positive effect on density. Finally, the share of self-employment (which in some countries – like Italy or Spain – proxies the extent of the informal sector of the economy) does not affect union density. In Table 7b we consider a different sub-sample of countries and years, dropping previous compositional variables and introducing age composition and temporary employment. The difference in the sample can be ascertained when observing that the general model does not fit these county/year observation, because most of the variables are either insignificant (employment and unemployment rates) or have the

[50] Considering the slight sample reduction due to available instruments, the sixth column of table 4 and the second column of table 5 are indistinguishable from a statistical point of view.

[51] We do not consider more than one sectoral variable in turn, since most of them are highly collinear.

opposite sign (the educational attainment); in addition the inflation rate exerts a positive short-term impact. With these caveats in mind, we see that both the young component in the employment (workers aged less than 35) and the temporary component of dependent employment have a negative impact onto union density. However, when both variables are jointly considered, they both lose significance, suggesting that they are capturing the same effect. However these results have to be taken with caution, and they cannot be extended to the entire sample (because potential distortions in sample selection).

On the whole, we find that the main compositional effects come from sectoral allocation of the employment. When some surplus is available (because reduced competition) unions face an easier task in unionising workers, since they provide 'better services' (either in terms of wage premia or employment protection). Age and gender effects do not indicate per se lower propensity to unionise within these components, but they are probably intertwined with the type of employment obtained. If women and/or youngsters are more likely to end working in the private services sector and/or with temporary employment contracts (the two conditions are rather frequent in the retailing sector, for example), then we register a lower union density due to these compositional effects.[52]

3.4.5 – Aggregate estimation

The validity of the existence of a common pattern of unionisation across European countries can also be assessed in a more heroic way. By summing union members and employees across countries one may construct a European density rate.[53] In a similar way one may construct employment and unemployment rates. Other conditioning variables can also be obtained by simply averaging country specific observations.[54] This is accomplished in Table 8, where the European union density is regressed onto the (country average) values of .previously exposed variables. In this case some cyclical and compositional factors are statistically significant in the short-term, but alternate signs according to the aggregation procedure. This is not surprising, given the fact that during the sample period business cycles and structural transformations were not synchronised across Europe. If we look at the first column (which corresponds to direct aggregation), we find that inflation reduces density in the short-term, whereas increase in employment rates raise it. Once again, improvements in educational attainment are beneficial to unions. In addition, some positive evidence is also recorded for the political attitude by the replacement rate variable, reaffirming that government attitudes matter for unionisation. As far as the long-term dimension, once again we find a negative correlation between union density and

[52] The only way to ascertain whether these compositional effects are attributable to anagraphic components (gender/age, which could be related to a change of preferences) or to job characteristics is to use individual observations and to control for self-selection.

[53] Given the fact that for five countries (Denmark, Ireland, Netherlands, Austria, Switzerland) we do not have sufficiently long information about dependent employees, we have considered total employment as the denominator of this variable (variable DEN1). This underestimates the true density. To control for this effect, we have also computed the simple average on country series (variable DEN2) and there is an average sample per cent difference of 0.23, which is due partly to a size effect and party to the different denominator. Given the fact that the average ratio of dependent to total employed is 0.81, the difference is almost entirely attributable to the latter factor. Moreover, since different countries have time series for union members and employees starting at different dates, in order not to lose observations for each year we have extended the sum across countries to non missing cases for both numerator and denominator (series DEN1). This obviously induces distortions in the dynamics when a country with an average density above or below the country average enters (or exits) the sample. However, for the period 1975-92 all 13 countries are present, whereas they decline to 10 going to the extremes (1960 and 1996).

[54] A more correct procedure would require weighted averages, where the weights would have requested bilateral exchange rates for all countries for the whole period. Since it is not clear whether nominal rates or international purchasing power rates would have been appropriate, the shorter way of simple averages has been followed.

unemployment and employment rates.[55] Diagnostic statistics are not very satisfactory, whereas the predictive ability for the aggregate model is depicted in Figure 5.

Though interesting, prudence must be used in tackling this result. Considering the European labour market as a single entity is obviously a heroic assumption. Not only do different national unions pursue different objects and operate under different legislative frameworks, but national union members are not substitutable at all, and the bulk of the national labour forces is not very mobile at international level. As a result labour market spillovers are still very limited, and the prediction of the present model can be taken just as a rough prediction of long-term evolutions. However, we believe that there is some truth in the claim that when, and if, the "Eurosclerosis" comes to an come to an end, this could bring about a trend reversal for European unions.

3.5 Further considerations on the relationship between unemployment and union density

Building on the theoretical results reviewed in the initial sections, we want to readdress the problem of the effect of unemployment on union membership. Let us consider a population of heterogeneous individuals. There will necessarily be some marginal workers who are indifferent between being member or not member. The unemployment rate lowers their outside option by lowering the expected wage in case of layoff. On one side they will evaluate the expected gain for remaining members, which could decline for a 'wage effect' (if the bargained wage is a mark-up on the outside option), but could also increase for a 'protection effect' if the unions provide employment protection against unfair dismissal for members and/or unemployed targeted services. On the other side, the expected utility from not being members may also vary if for example the unemployment risk is differentiated among different types of workers (for example due to skill-biased technical change). Overall it is impossible to predict a univocal effect of unemployment onto aggregate membership. Our finding that in the short-term past unemployment rates tend to exert a negative impact in most (but not all) countries could be taken as evidence in support of the claim that unemployment reduces expected gains from union activity. The additional finding that unemployment has a long-term negative relationship with density does not provide further support to the same claim, since we cannot ascertain the direction of causality.[56]

On the other hand, when unions provide their members with private goods, either in the form of legal advice (which translates into a reduced probability of unfair dismissal)[57] or in the form of direct provision of benefits (from legal and pension advice to job training, from job placement to direct allocation of benefits) the relationship between unemployment and union density becomes positive, as witnessed by Nordic countries, where short-term correlation is negative but long-term one is positive. Is the provision of private goods sufficient to account for the diversity of the "high density" countries we have recorded in the country by country estimates ? In our opinion, the answer is negative. Only in the Danish case (where the unemployment benefits are conditional to being enrolled in private "insurance" funds, which are mostly administered by unions) do we find an institutional device directly explaining such a correlation. In the other Nordic countries, the relationship has probably to do with the general perception that unions are deeply involved in the fight against unemployment. As a

[55] The estimated values are analogous to those obtained in the panel estimates: the long-term elasticity with the unemployment rate is –0.57, whereas with the employment rate is –5.31 (which is higher than the panel estimation).

[56] In the aggregate, causation may go in the opposite direction: if union power is correlated with union density, more powerful unions bargain higher wage increases, yielding lower employment and/or higher unemployment. See Nickell 1997 and Blanchard and Wolfers 2000.

[57] Blanchflower and oths 1990 find a positive correlation between local unemployment rates and union density at firm level, and explain it as a result of insurance provision by the unions. On the evidence of provision of excludable incentive goods by unions see Booth and Chatterji 1995.

consequence keeping a union strong (in terms of members, resources and financial resources) is equivalent to "voting" for wage moderation and employment policies. So long as this commitment of unions is credible, and unemployment remains under control (by the government, the unions and their counterparts), a positive correlation persists. As soon as confidence in the unions' ability to protect against unemployment decreases, the relationship may revert to negative.

3.6 Concluding remarks

We have followed a business cycle approach to study the determinants of union density, finding evidence of negative effects of labour market slack (proxied by unemployment) and some impact of compositional effects (negative impact of increased labour market participation, as measured by the employment rates, and positive effect of educational attainment in the population, as measured by the population with secondary degrees or more). For a subset of countries we also show that the sectoral changing composition (decline of industry and increase in private services) and increased flexibility in the labour market (as measured by temporary workers) have an adverse effect on density. This pattern is common to all 14 European countries under analysis, with national variations due to inflation rates, wage shares on value added, unemployment subsidies and government political orientation. However Nordic countries distinguish themselves from the common pattern in that they exhibit a positive long-term relationship between union density and unemployment. This may possibly be explained by the fact that Nordic unions provide services to unemployed workers (the so-called Ghent system: mainly administration of unemployment benefits, but also job counselling and general training). The general model is robust enough to appear even when we consider Europe as a single labour market and aggregate national membership as if it were a single union. Thus, the future for European unions may appear less gloomy than suggested at first glance. Two offsetting tendencies are at work here: if improved macroeconomic conditions provide labour demand expansion, we expect unemployment reductions and, other things being constant, an increase in membership. On the other hand, increased labour market participation (especially in southern European countries) brings to the labour market people who are employed in more precarious jobs (like the retailing sector). The overall impact is hard to predict. The experience of Nordic countries suggests that there is a potential role for unions even under adverse labour market conditions, whenever unions are concerned with the entire labour force, and are able to provide services to both the employed and the unemployed. This may prove beneficial, because it creates a precondition for wage bargaining co-ordination.

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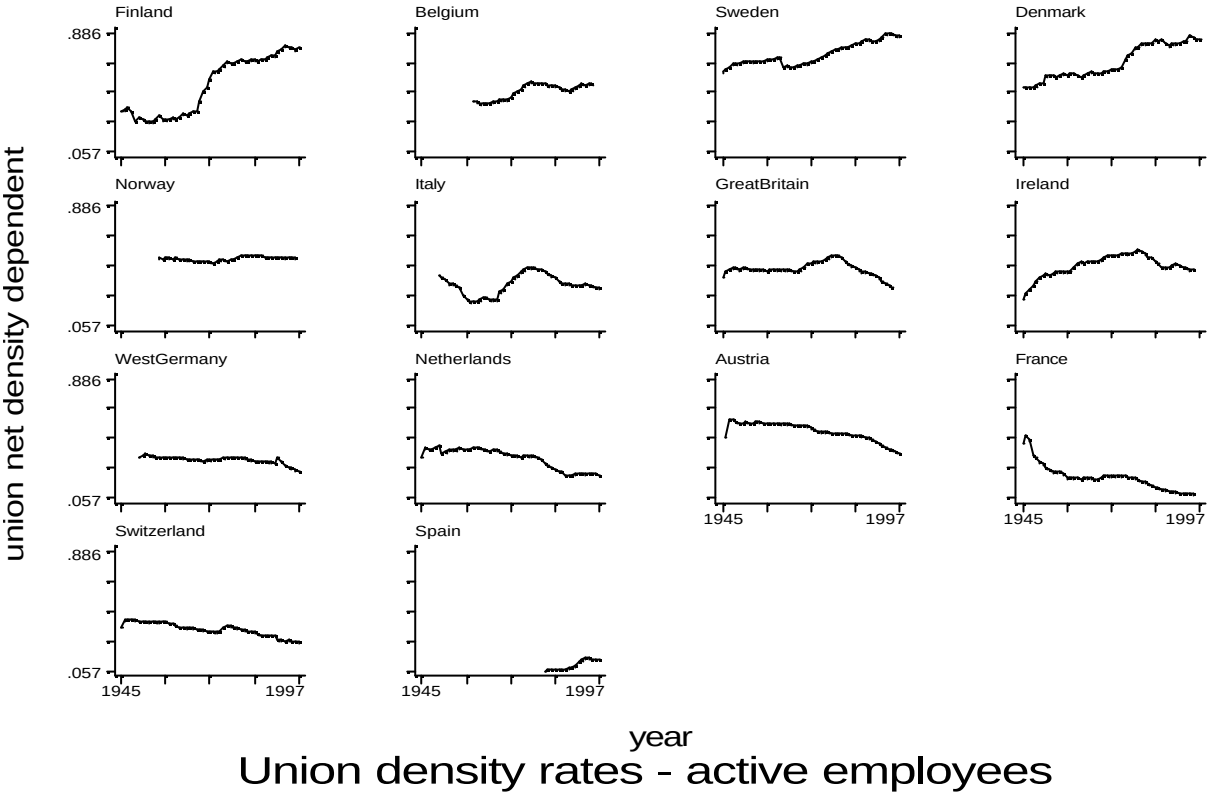
FIGURE 1



Union density rates - active employees

FIGURE 2

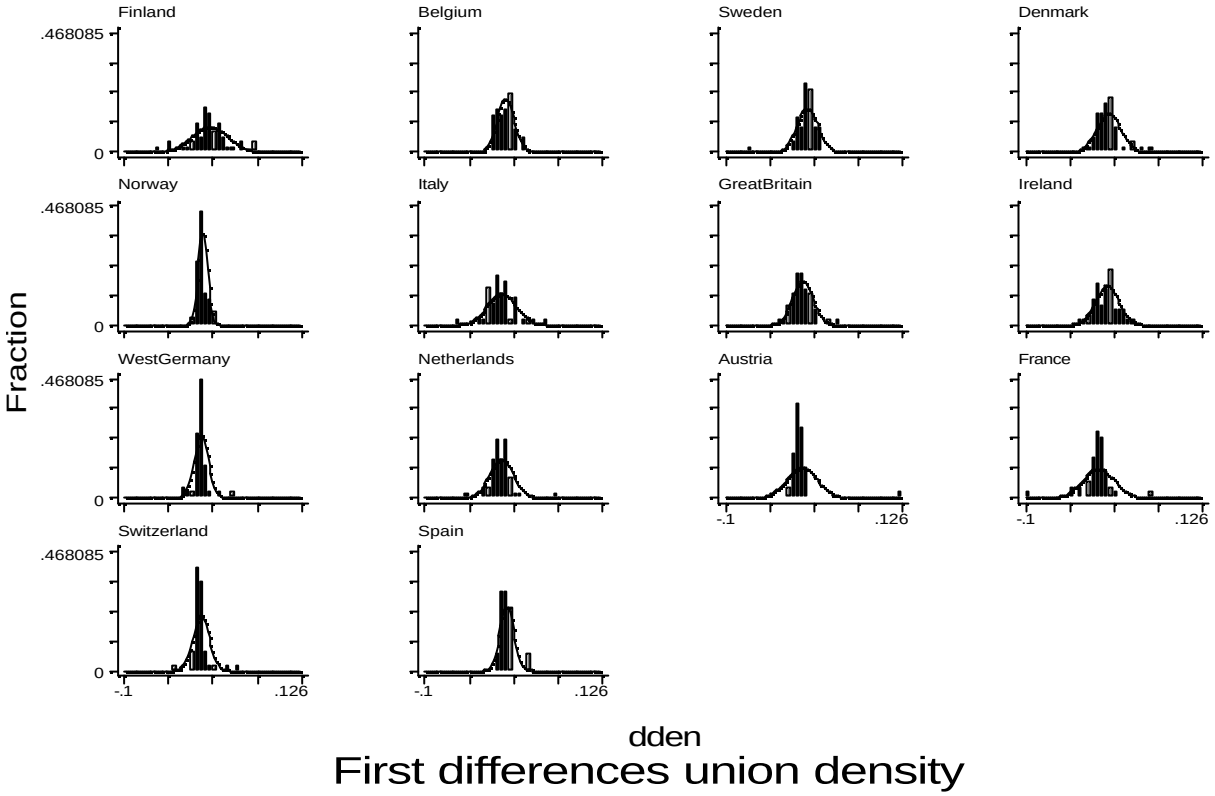
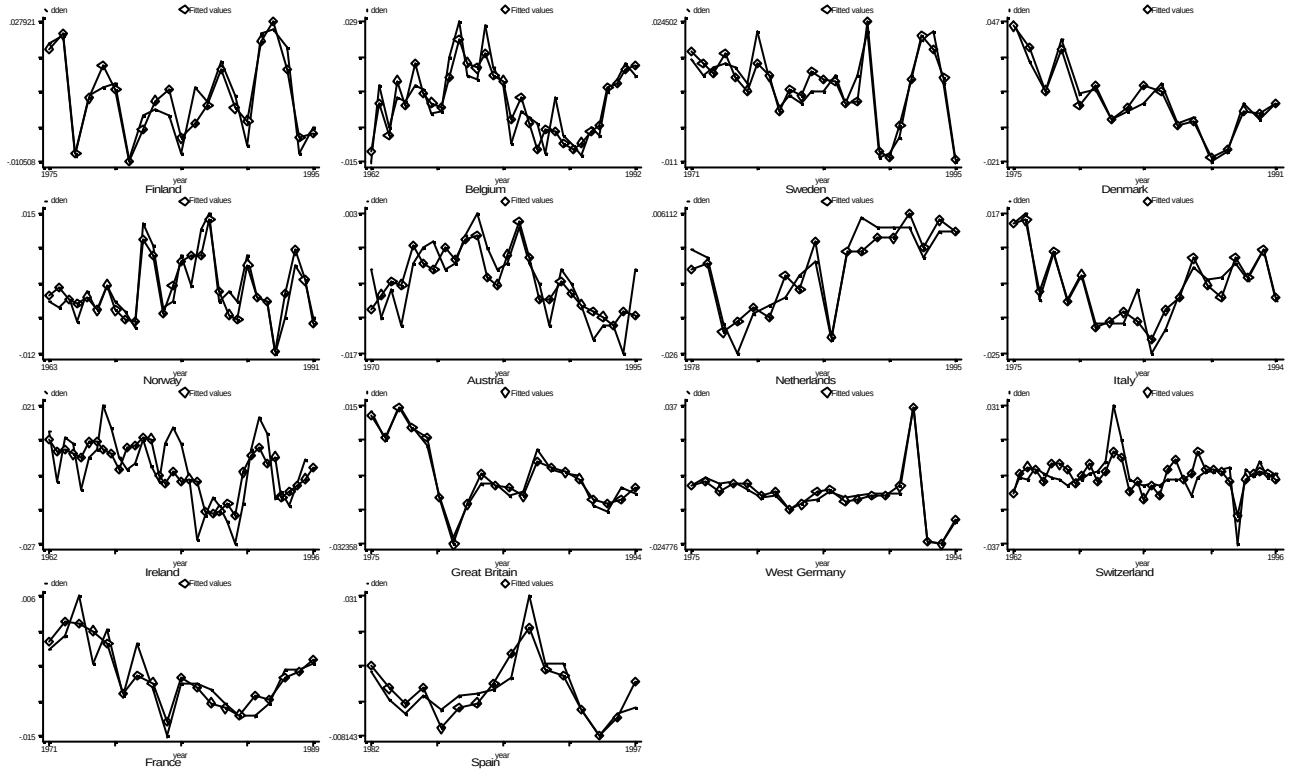
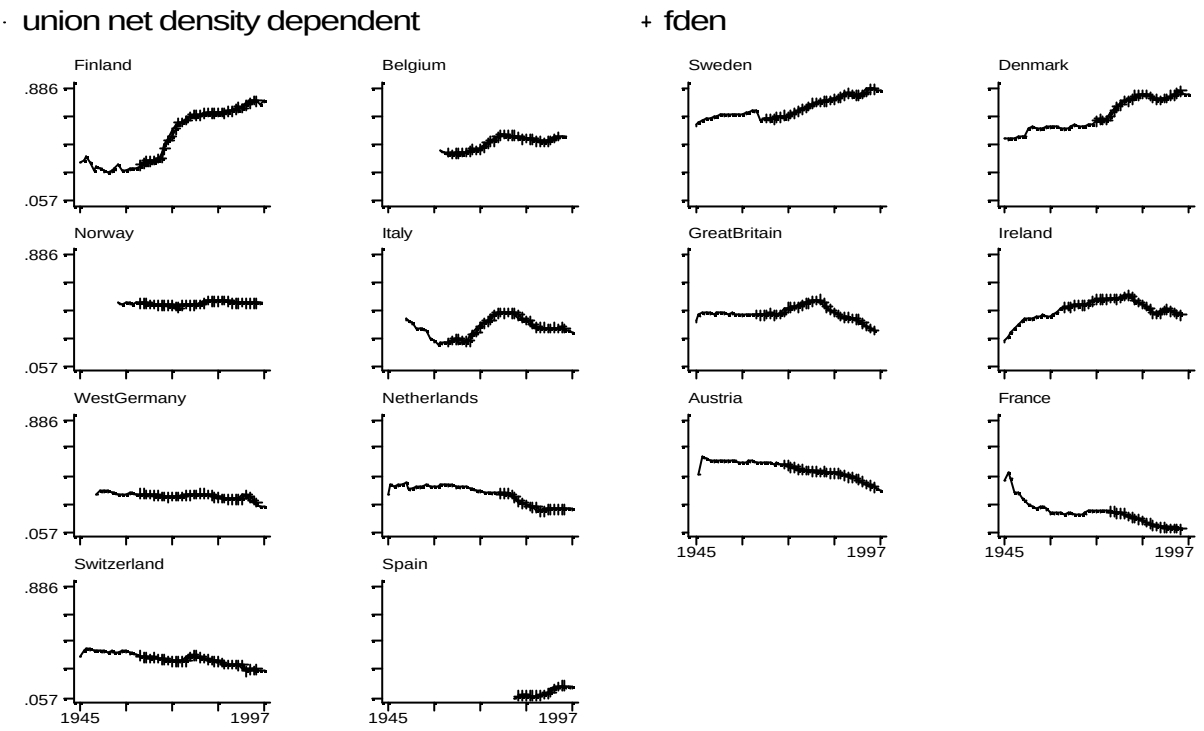

Finland
Belgium
Sweden
Denmark
Norway
Italy
GreatBritain
Ireland
WestGermany
Netherlands
Austria
France
Switzerland
Spain
.468085
0
-.1
.126
Fraction
dden
First differences union density

FIGURE 3



Country by country estimates - first differences

FIGURE 4



Actual and predicted union density

FIGURE 5

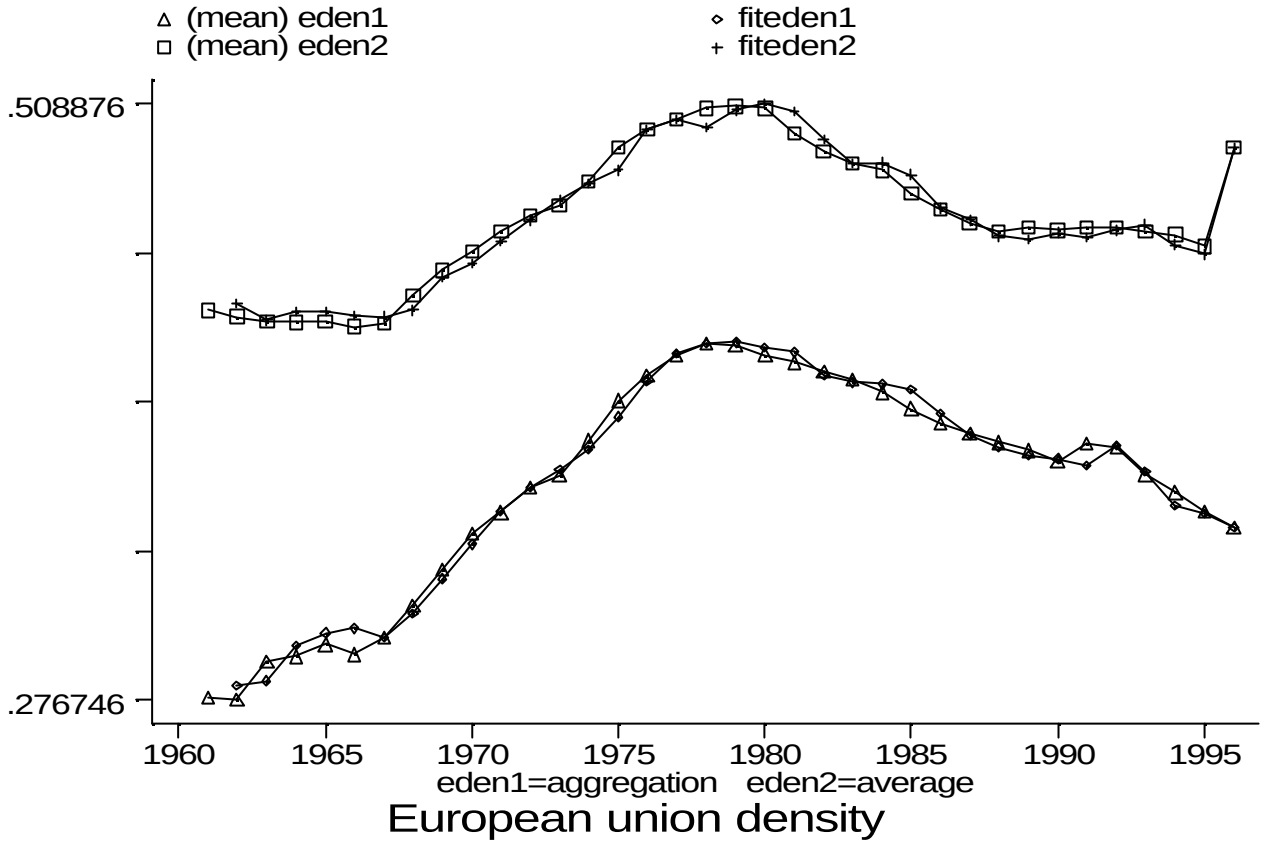

(mean) eden1
(mean) eden2
fiteden1
fiteden2
.508876
.276746
1960
1965
1970
1975
1980
1985
1990
1995
eden1=aggregation eden2=average
European union density

Table 1 – Country averages of the relevant variables – available samples

	Finland	Belgium	Sweden	Denmark	Norway	Italy	Great Britain	Ireland	West Germany	Nether ands	Austria	France	Switzer land	Spain
DEN	0.518	0.479	0.738	0.682	0.519	0.339	0.447	0.469	0.322	0.333	0.522	0.203	0.346	0.097
UNE	0.069	0.086	0.029	0.074	0.046	0.104	0.067	0.107	0.058	0.069	0.024	0.087	0.007	0.128
INFL	0.066	0.045	0.063	0.071	0.060	0.083	0.072	0.076	0.034	0.042	0.041	0.058	0.036	0.092
WASH	0.569	0.623	0.601	0.563	0.475	0.550	0.679	===	0.547	0.516	===	0.531	===	===
PART	0.500	0.408	0.504	0.519	0.459	0.412	0.474	0.379	0.463	0.421	0.429	0.429	0.517	0.384
EMPL	0.465	0.372	0.490	0.480	0.437	0.370	0.442	0.339	0.436	0.379	0.418	0.392	0.514	0.335
GENDER	0.469	0.345	0.470	===	0.403	0.316	0.413	===	0.382	===	===	0.399	0.360	0.292
IND	0.391	0.429	0.330	===	0.345	0.447	0.396	===	0.488	===	===	0.400	0.534	0.416
PA	0.273	0.308	0.368	===	0.298	0.253	0.267	===	0.243	===	===	0.283	0.077	0.257
SE	0.303	0.246	0.280	===	0.331	0.214	0.318	===	0.255	===	===	0.295	0.337	0.255
MON	0.083	0.093	0.078	===	0.116	0.069	0.086	===	0.076	===	===	0.082	0.082	0.071
INTO	0.206	0.193	0.091	===	0.163	0.319	0.099	===	0.144	===	===	0.176	0.160	0.297
YOUNG	0.355	0.473	0.351	0.458	===	0.433	0.450	0.553	0.438	0.502	0.489	0.442	===	0.459
TEMPOR	0.171	0.058	0.122	0.106	===	0.063	0.062	0.093	0.100	0.095	0.074	0.091	===	0.277
PARSH	===	0.015	0.270	===	0.030	===	===	===	0.021	===	===	===	===	0.081
FHC	0.365	0.412	0.517	0.534	0.349	0.289	0.421	0.424	0.258	0.474	0.395	0.267	0.495	0.197
GOVN	0.381	-1.000	1.000	-0.143	0.429	0.238	-0.524	-1.000	-0.238	-0.619	1.000	-0.048	-0.190	0.722
BENEFIT	0.245	0.415	0.223	0.479	0.206	0.039	0.226	0.243	0.289	0.395	0.188	0.327	0.132	0.230
SPART	0.121	0.012	0.017	0.032	0.009	0.425	0.051	0.030	0.007	0.005	0.004	0.060	0.000	0.266

Legend:
DEN = union net density (active dependent members, excluding unemployed or retired)
UNE = unemployment rate (unemployed/labour force)
INFL = inflation rate of consumer price index
WASH = wage share on value added – private sector
PART = participation rate (labour force/population)
EMPL = employment rate (employed/population)
GENDER = female component of dependent employment
IND = industry share in dependent employment
PA = public employment share in dependent employment
SE = private service share in dependent employment
MON = employment in "natural monopolies" (energy-gas-water-transport-telecommunications) in dependent employment
INTO = self-employment share in total employment
YOUNG = share of dependent employment younger than 35 year old
TEMPOR = share of temporary worker in dependent employment
PARSH = part-time and other non-standard employment share on dependent employment
FHC = population share with secondary or college degree (interpolation on quinquennial observations)
GOVN = government political orientation (pro-labour +1; conservative –1)
BENEFIT = replacement rate
SPART = strike participation (strikers/employees).

Table 2 – Sample correlation of the relevant variables – available sample dimensions in italics

	DEN	UNE	INFL	WASH	PART	EMPL	GENDER	IND	PA	SE	MON	INTO	YOUNG	TEMPOR	PARSH	FHC	GOVN	BENEFIT	SPART
DEN	1																		
	660																		
UNE	-0.2478	1																	
	477	*501*																	
INFL	0.1807	0.0487	1																
	483	*483*	*512*																
WASH	0.1846	-0.0592	0.2652	1															
	268	*263*	*261*	*268*															
PART	0.4177	-0.3787	-0.2004	0.063	1														
	453	*476*	*461*	*263*	*477*														
EMPL	0.4049	-0.6629	-0.1722	0.0792	0.9429	1													
	455	*476*	*462*	*262*	*476*	*479*													
GENDER	0.6104	-0.072	-0.1343	0.0153	0.7196	0.5546	1												
	316	*325*	*319*	*212*	*324*	*325*	*326*												
IND	-0.4114	-0.3079	0.0642	0.0825	-0.4276	-0.2046	-0.7204	1											
	283	*293*	*286*	*212*	*292*	*292*	*293*	*293*											
PA	0.4607	0.3017	-0.112	0.0189	0.3368	0.1373	0.6532	-0.8755	1										
	283	*293*	*286*	*212*	*292*	*292*	*293*	*293*	*293*										
SE	0.2268	-0.032	-0.1443	-0.1349	0.5312	0.4147	0.6799	-0.6623	0.3396	1									
	283	*293*	*286*	*212*	*292*	*292*	*293*	*293*	*293*	*293*									
MON	0.2603	-0.2522	-0.2039	-0.2952	-0.0039	0.0858	0.0543	-0.1492	0.0283	0.4129	1								
	283	*293*	*286*	*212*	*292*	*292*	*293*	*293*	*293*	*293*	*293*								
INTO	-0.4967	0.3425	0.1413	-0.3981	-0.6419	-0.6233	-0.6682	0.3848	-0.4434	-0.5099	-0.1971	1							
	283	*293*	*286*	*212*	*292*	*292*	*293*	*293*	*293*	*293*	*293*	*293*							
YOUNG	-0.1136	0.1655	0.1475	0.0518	-0.4468	-0.3847	-0.3912	0.1022	-0.0442	-0.0612	0.2877	0.0976	1						
	131	*121*	*133*	*85*	*119*	*118*	*72*	*72*	*72*	*72*	*72*	*72*	*150*						
TEMPOR	-0.1883	0.5095	-0.0868	-0.4059	-0.1234	-0.2435	-0.3507	0.0346	-0.1074	-0.0772	-0.3813	0.286	-0.1467	1					
	131	*121*	*133*	*85*	*119*	*118*	*72*	*72*	*72*	*72*	*72*	*72*	*150*	*150*					
PARSH	0.7432	-0.4124	0.3483	0.1206	0.5248	0.5095	0.5755	-0.4537	0.5709	0.0254	-0.1735	-0.3253	-0.6589	0.2724	1				
	34	*34*	*34*	*17*	*33*	*33*	*34*	*34*	*34*	*34*	*34*	*34*	*22*	*22*	*34*				
FHC	0.359	0.1456	-0.127	0.0851	0.4498	0.3317	0.6283	-0.7694	0.8044	0.4689	0.028	-0.6057	0.2113	-0.0386	0.5613	1			
	483	*490*	*486*	*268*	*468*	*469*	*320*	*288*	*288*	*288*	*288*	*288*	*115*	*115*	*31*	*504*			
GOVN	0.1256	-0.2047	0.1379	-0.0306	0.0814	0.1356	0.0538	-0.0226	0.0432	-0.1267	-0.2092	0.0558	-0.3169	0.3633	0.5795	-0.152	1		
	288	*287*	*287*	*191*	*287*	*286*	*197*	*177*	*177*	*177*	*177*	*177*	*115*	*115*	*31*	*291*	*291*		
BENEFIT	0.178	0.3133	-0.0976	0.0204	0.1842	0.0366	0.356	-0.2918	0.5068	0.1214	0.0534	-0.4809	0.1695	0.1533	-0.3655	0.5303	-0.1687	1	
	479	*487*	*486*	*268*	*463*	*465*	*321*	*288*	*288*	*288*	*288*	*288*	*127*	*127*	*34*	*490*	*291*	*504*	
SPART	-0.1237	0.3061	0.4138	0.0537	-0.2542	-0.3052	-0.3103	0.16	-0.164	-0.4091	-0.3911	0.5098	-0.221	0.3842	-0.1127	-0.2597	0.1277	-0.3018	1
	423	*430*	*419*	*258*	*430*	*432*	*317*	*285*	*285*	*285*	*285*	*285*	*104*	*104*	*31*	*432*	*279*	*428*	*432*

Legend: see Table 1

Table 3a - Determinants of union density – "High density" countries

(robust regressions - t-statistics in parentheses)

Model :	Finland	Belgium	Sweden	Denmark	Norway	Austria
# obs :	21	31	25	17	27	26
Period:	1975-95	1962-92	1971-95	1975-91	1963-91	1970-95
Depvar:	Δden	Δden	Δden	Δden	Δden	Δden
intcpt	0.111	0.675	-0.148	0.237	0.172	0.157
	(1.82)	(2.95)	(-3.05)	(6.26)	(3.11)	(2.31)
ΔuneL1	-0.898	0.911	-0.903	-1.022	-0.277	
	(-4.12)	(2.12)	(-3.40)	(-5.25)	(-1.47)	
Δinfl	0.169			-0.335	0.048	0.117
	(2.17)			(-4.42)	(2.14)	(2.54)
Δwash					-0.189	
					(-4.78)	
ΔemplL1	-2.122	1.578	-1.478			0.456
	(-6.24)	(2.09)	(-5.97)			(2.21)
Δpa	-0.370	0.964	-0.438			
	(-0.99)	(1.79)	(-1.76)			
Δind	-0.966		-0.779		0.274	
	(-2.78)		(-3.06)		(4.33)	
Δgender		-1.836	1.349			
		(-2.22)	(3.73)			
Δfhc	1.337	8.013		10.807	-0.858	
	(4.01)	(6.27)		(2.62)	(-1.64)	
govn	0.003			0.016		
	(0.92)			(4.01)		
Δbenefit		-0.106	0.057		0.057	0.054
		(-1.51)	(1.76)		(1.74)	(2.05)
Δspart	0.038	-0.221	0.034	-0.049	0.107	
	(3.01)	(-1.69)	(3.71)	(-3.73)	(7.08)	
denL1	-0.147	-0.253	-0.231	-1.118	-0.405	-0.029
	(-1.56)	(-2.88)	(-5.97)	(-4.70)	(-3.28)	(-0.56)
uneL1	-0.221	-0.603	0.711	1.340	0.149	0.506
	(-1.93)	(-5.21)	(3.83)	(5.20)	(1.15)	(3.78)
emplL1		-1.490	0.623	0.995	0.099	-0.391
		(-2.83)	(4.46)	(3.68)	(3.03)	(-3.38)
R^2	0.873	0.818	0.894	0.95	0.824	0.607
DW	2.46	2.30	2.03	2.13	2.08	1.91
RESET(pval)	0.04	0.37	0.59	0.39	0.12	0.96
Avg DEN	0.71	0.48	0.79	0.79	0.52	0.49
			Long-term relationship of DEN with			
UNE	-1.50	-2.38	3.07	1.19	0.36	17.5
EMPL	--	-5.87	2.69	0.89	0.24	-13.5

Legend: see Table 1 – ΔX indicates first differences of X – XL1 indicates the variable X lagged 1 year.

Table 3b - Determinants of union density – "intermediate density" countries

(robust regressions - t-statistics in parentheses)

Model :	Netherl	Italy	Ireland	Britain	Germany	Switzlnd
# obs :	18	20	35	20	20	35
Period:	1978-95	1975-94	1962-96	1975-94	1975-94	1962-96
Depvar:	Δden	Δden	Δden	Δden	Δden	Δden
intcpt	-0.704	0.833	0.722	0.003	0.454	0.061
	(-2.62)	(8.77)	(3.98)	(0.03)	(5.07)	(2.34)
ΔuneL1	-1.577	0.706		-0.543	0.502	-0.690
	(-4.50)	(2.64)		(-2.28)	(2.17)	(-1.64)
Δinfl	-0.273	0.041		0.078		-0.228
	(-2.31)	(1.88)		(4.35)		(-1.97)
Δwash	-0.372	-0.224		-0.189	-0.211	
	(-1.44)	(-1.68)		(-3.93)	(-1.86)	
ΔemplL1		2.367	0.370	-0.932	1.051	-0.147
		(6.26)	(0.94)	(-2.21)	(4.40)	(-1.47)
Δpa					0.923	
					(2.47)	
Δind					1.706	
					(4.32)	
Δgender		-1.083			2.371	-1.232
		(-5.16)			(3.07)	(-1.97)
Δfhc		10.795		-3.227		
		(2.81)		(-3.66)		
govn	0.008	-0.011		0.022	-0.007	
	(2.44)	(-2.68)		(9.07)	(-4.36)	
Δbenefit	-0.442		-0.221		-0.452	
	(-1.86)		(-1.74)		(-1.35)	
Δspart	1.013			-0.071		
	(3.42)			(-3.92)		
denL1	0.797	-0.585	-0.397	-0.105	-0.327	-0.176
	(2.63)	(-9.70)	(-3.67)	(-3.23)	(-1.79)	(-2.46)
uneL1	1.265	-0.797	-0.853	0.110	-0.610	-0.422
	(2.70)	(-4.52)	(-4.67)	(0.97)	(-3.52)	(-1.82)
emplL1	0.970	-1.734	-1.272	0.147	-0.722	
	(2.50)	(-9.14)	(-3.74)	(0.80)	(-7.59)	
R^2	0.851	0.901	0.463	0.964	0.98	0.458
DW	1.97	2.62	1.49	2.40	1.76	1.50
RESET(pval)	0.75	0.44	0.79	0.38	0.09	0.00
Avg DEN	0.26	0.38	0.51	0.44	0.31	0.32
			Long-term relationship of DEN with			
UNE	-1.58	-1.36	-2.14	1.04	-2.20	-2.39
EMPL	-1.21	-2.96	-3.20	1.39	--	--

Legend: see Table 1 – ΔX indicates first differences of X – XL1 indicates the variable X lagged 1 year.

Table 3c - Determinants of union density – "low density" countries

(robust regressions - t-statistics in parentheses)

Model :	France	Spain
# obs :	19	16
Period:	1971-89	1982-97
Depvar:	Δden	Δden
intcpt	0.483	-0.427
	(2.67)	(-2.21)
ΔuneL1	0.841	
	(2.51)	
Δinfl		-0.194
		(-1.65)
ΔemplL1	1.296	-0.720
	(2.25)	(-2.43)
Δfhc	-1.287	
	(-1.61)	
Δspart	-0.045	
	(-2.24)	
denL1	-0.532	-0.503
	(-3.26)	(-2.45)
uneL1	-0.978	0.326
	(-4.14)	(1.52)
emplL1	-0.758	1.357
	(-1.90)	(2.43)
R^2	0.796	0.777
DW	2.73	1.87
RESET(pval)	0.76	0.15
Avg DEN	0.16	0.10
Long-term relationship of DEN with		
UNE	-1.83	0.64
EMPL	-1.42	2.69

Legend: see Table 1 – ΔX indicates first differences of X – XL1 indicates the variable X lagged 1 year.

Table 4 - Determinants of union density (fixed effects)
(t-statistics in parentheses)

# obs :	432	426	419	394	283	406
Depvar:	Δden	Δden	Δden	Δden	Δden	Δden
intcpt	0.046	0.045	0.043	0.051	0.083	0.042
	(3.55)	(3.38)	(3.25)	(3.65)	(3.67)	(3.15)
Δunel1	-0.10	-0.102	-0.114	-0.118	-0.173	-0.124
	(-1.29)	(-1.27)	(-1.44)	(-1.46)	(-2.26)	(-1.54)
ΔemplL1	-0.209	-0.216	-0.217	-0.225	-0.309	-0.220
	(-2.12)	(-2.12)	(-2.19)	(-2.22)	(-2.97)	(-2.18)
Δinfl		0.018				
		(0.76)				
Δfhc			0.112			0.104
			(1.65)			(1.49)
Δspart				0.005		
				(0.96)		
govn					0.000	
					(0.32)	
Δbenefit						0.042
						(1.47)
denL1	-0.027	-0.027	-0.025	-0.030	-0.062	-0.026
	(-3.12)	(-3.11)	(-2.80)	(-3.21)	(-3.01)	(-2.85)
denL1*DK	-0.231	-0.209	-0.244	-0.232	-0.269	-0.238
	(-4.60)	(-3.58)	(-4.35)	(-4.10)	(-4.32)	(-4.22)
denL1*NL	-0.096	-0.097	-0.110	-0.099	-0.087	-0.113
	(-1.83)	(-1.83)	(-2.03)	(-1.82)	(-1.72)	(-2.06)
denL1*UK	0.065	0.066	0.065	0.069	0.095	0.068
	(1.80)	(1.81)	(1.79)	(1.87)	(2.53)	(1.85)
uneL1	-0.128	-0.126	-0.132	-0.129	-0.143	-0.125
	(-6.34)	(-6.13)	(-6.17)	(-5.79)	(-4.68)	(-5.65)
uneL1*DK	0.681	0.60	0.704	0.692	0.547	0.696
	(5.23)	(4.11)	(5.05)	(4.90)	(4.19)	(4.96)
emplL1	-0.041	-0.043	-0.038	-0.047	-0.075	-0.035
	(-1.45)	(-1.51)	(-1.30)	(-1.56)	(-1.83)	(-1.20)
R^2(within)	0.212	0.199	0.202	0.211	0.253	0.204
Hausman	75.02	507.1	62.99	63.78	168.5	52.08
Long-term relationship of DEN (all countries) with						
UNE	-4.79	-4.71	-5.29	-4.25	-2.30	-4.85
EMPL	-1.51	-1.60	-1.51	-1.55	-1.20	-1.36

Legend: see Table 1 – ΔX indicates first differences of X – XL1 indicates the variable X lagged 1 year.

Table 5 - Determinants of union density (instrumental variables fixed effects – robust estimates)
(t-statistics in parentheses)

# obs :	395	395	395	395	395	395
Depvar:	Δden	Δden	Δden	Δden	Δden	Δden
instr :			Δpop Δexp	Δpop Δexp	Δpart Δexp	Δpart Δexp
intcpt	0.057	0.046	0.188	0.067	0.051	0.041
	(5.43)	(4.46)	(1.74)	(1.05)	(4.72)	(3.80)
Δune	-0.381		-0.924		-0.605	
	(-4.58)		(-1.00)		(-1.72)	
Δempl	-0.540		-2.042		-0.60	
	(-4.68)		(-1.26)		(-4.15)	
ΔuneL1		-0.130		0.088		0.141
		(-1.63)		(0.16)		(0.39)
ΔemplL1		-0.227		-0.186		-0.146
		(-2.17)		(-0.26)		(-1.14)
Δfhc	0.113	0.101	0.082	0.044	0.076	0.052
	(1.45)	(1.34)	(0.59)	(0.49)	(0.93)	(0.65)
Δbenefit	0.034	0.038	0.024	0.042	0.040	0.041
	(1.42)	(1.47)	(0.62)	(1.61)	(1.59)	(1.51)
denL1	-0.024	-0.029	-0.029	-0.040	-0.025	-0.041
	(-1.50)	(-1.76)	(-1.24)	(-2.32)	(-1.40)	(-2.34)
denL1*dk	-0.213	-0.234	-0.230	-0.037	-0.227	-0.132
	(-3.65)	(-3.90)	(-0.61)	(-0.12)	(-1.15)	(-0.52)
denL1*nl	-0.121	-0.113	-0.370	-0.164	-0.098	-0.119
	(-3.50)	(-2.50)	(-1.67)	(-1.32)	(-2.42)	(-2.18)
denL1*uk	0.076	0.070	0.082	0.076	0.102	0.081
	(2.09)	(1.79)	(1.34)	(1.60)	(2.76)	(1.87)
uneL1	-0.140	-0.128	-0.131	-0.076	-0.073	-0.069
	(-7.26)	(-6.45)	(-2.06)	(-1.65)	(-2.42)	(-1.77)
uneL1*dk	0.616	0.696	0.854	0.145	0.569	0.403
	(4.73)	(4.86)	(0.81)	(0.17)	(0.96)	(0.52)
emplL1	-0.069	-0.042	-0.494	-0.147	-0.089	-0.065
	(-2.72)	(-1.69)	(-1.55)	(-0.79)	(-3.03)	(-2.21)
R^2	0.421	0.379	0.00	0.290	0.372	0.323
Sargan (pval)	==	==	0.99	0.99	0.99	1.00
Long-term relationship of DEN (all countries) with						
UNE	-5.85	-4.46	-4.48	-1.89	-2.87	-1.71
EMPL	-2.88	-1.45	-16.8	-3.67	-3.53	-1.59

Legend: see Table 1 – ΔX indicates first differences of X – XL1 indicates the variable X lagged 1 year.

Table 6 - Determinants of union density – comparison of alternative models

	Finland	Belgium	Sweden	Denmark	Norway	Austria	Nether lands	Italy	Ireland	Great Britain	West Germany	Switzer land	France	Spain	Europe15
long-term effect - country by country estimates															
UNE	-1.50	-2.38	3.07	1.19	0.36	17.50	-1.58	-1.36	-2.14	1.04	-2.20	-2.39	-1.83	0.64	-2.85
EMPL	--	-5.87	2.69	0.89	0.24	-13.50	-1.21	-2.96	-3.20	1.39	--	--	-1.42	2.69	-4.57
long-term effect - panel fixed effects (last column of table 4)															
UNE	-4.85	-4.85	-4.85	2.16	-4.85	-4.85	-0.90	-4.85	-4.85	2.96	-4.85	-4.85	-4.85	-4.85	-4.85
EMPL	-1.36	-1.36	-1.36	-0.13	-1.36	-1.36	-0.25	-1.36	-1.36	0.83	-1.36	-1.36	-1.36	-1.36	-1.36
for reference: average density (over the estimation period)															
avgDEN	0.71	0.48	0.79	0.79	0.52	0.49	0.26	0.38	0.51	0.44	0.31	0.32	0.16	0.10	0.36

Table 7a – Compositional effects in union density (fixed effects)
(t-statistics in parentheses)

# obs :	256	256	256	256	256	256
Depvar:	Δden	Δden	Δden	Δden	Δden	Δden
intcpt	0.055	0.043	0.049	0.046	0.057	0.049
	(3.20)	(2.50)	(2.87)	(2.68)	(3.31)	(2.78)
ΔuneL1	-0.218	-0.138	-0.256	-0.218	-0.308	-0.270
	(-1.73)	(-1.03)	(-2.02)	(-1.66)	(-2.44)	(-2.12)
ΔemplL1	-0.466	-0.475	-0.529	-0.571	-0.605	-0.569
	(-2.74)	(-2.69)	(-2.97)	(-3.25)	(-3.47)	(-3.21)
Δfhc	0.180	0.151	0.151	0.169	0.152	0.161
	(2.01)	(1.72)	(1.68)	(1.89)	(1.72)	(1.80)
Δind		0.392				
		(2.79)				
Δgend		0.638	0.371	0.544	0.532	0.417
		(3.08)	(1.89)	(2.58)	(2.70)	(2.13)
Δse			-0.238			
			(-1.43)			
Δpa				-0.246		
				(-1.55)		
Δmon					0.717	
					(2.63)	
Δinto						0.012
						(0.10)
Δbenef	0.065	0.062	0.063	0.063	0.046	0.063
	(1.65)	(1.61)	(1.61)	(1.60)	(1.17)	(1.60)
denL1	-0.013	-0.011	-0.014	-0.012	-0.016	-0.015
	(-1.24)	(-1.05)	(-1.35)	(-1.09)	(-1.54)	(-1.34)
uneL1	-0.166	-0.165	-0.152	-0.168	-0.157	-0.156
	(-5.69)	(-5.67)	(-5.17)	(-5.53)	(-5.41)	(-5.22)
emplL1	-0.085	-0.059	-0.075	-0.068	-0.092	-0.075
	(-2.20)	(-1.54)	(-1.93)	(-1.75)	(-2.38)	(-1.92)
R^2	0.194	0.234	0.216	0.217	0.232	0.209

Note: data refer to the following country/year: Finland (1962-95), Belgium (1962-92), Sweden (1960-95), Norway (1962-95), Italy (1962-94), Great Britain (1962-95), West Germany (1962-95), France (1975-89), Switzerland (1971), Spain (1982-95).

Table 7b – Compositional effects in union density (fixed effects)
(t-statistics in parentheses)

# obs :	95	95	95	95
Depvar:	Δden	Δden	Δden	Δden
intcpt	0.045	0.076	0.037	0.066
	(0.56)	(0.96)	(0.47)	(0.83)
ΔuneL1	-0.116	-0.101	-0.120	-0.106
	(-0.82)	(-0.73)	(-0.86)	(-0.76)
Δinfl	0.233	0.202	0.232	0.206
	(3.02)	(2.61)	(3.02)	(2.65)
ΔemplL1	-0.192	-0.189	-0.160	-0.171
	(-0.94)	(-0.94)	(-0.79)	(-0.84)
Δfhc	-0.183	-0.271	-0.265	-0.305
	(-1.46)	(-2.08)	(-1.96)	(-2.24)
Δtempor		-0.108		-0.091
		(-2.01)		(-1.57)
Δyoung			-0.263	-0.156
			(-1.50)	(-0.84)
denL1	-0.083	-0.108	-0.085	-0.105
	(-1.93)	(-2.45)	(-1.99)	(-2.37)
uneL1	-0.10	-0.105	-0.046	-0.073
	(-0.84)	(-0.91)	(-0.38)	(-0.59)
uneL1*DK	0.659	0.812	0.686	0.803
	(3.49)	(4.05)	(3.64)	(4.00)
emplL1	-0.018	-0.072	-0.013	-0.060
	(-0.11)	(-0.45)	(-0.08)	(-0.38)
R^2	0.308	0.343	0.328	0.349

Note: data refer to the following country/year: Belgium (1984-93), Denmark (1984-91), Italy (1984-95), Great Britain (1984-95), Ireland (1984-95), West Germany (1984-95), Netherlands (1988-95), France (1984-95), Spain (1987-95).

Table 8 - Determinants of European union density
(robust regressions - t-statistics in parentheses)

Model :	aggregation	average
# obs :	35	35
Period:	1962-96	1962-96
Depvar:	Δden	Δden
intcpt	0.173	0.014
	(2.73)	(0.15)
Δinfl	-0.106	0.075
	(-1.94)	(1.37)
ΔemplL1	0.677	-0.350
	(2.44)	(-1.46)
Δfhc	0.010	-0.079
	(1.35)	(-21.46)
Δbenefit	0.30	0.264
	(2.38)	(1.78)
denL1	-0.070	-0.012
	(-1.98)	(-0.19)
uneL1	-0.199	-0.082
	(-4.87)	(-1.25)
emplL1	-0.320	-0.007
	(-2.40)	(-0.04)
R^2	0.731	0.781
DW	1.65	1.21
RESET(pval)	0.01	0.17
Avg DEN	0.36	0.46
Long-term relationship of DEN with		
UNE	-2.85	-6.85
EMPL	-4.57	-0.60

Legend: see Table 1 – ΔX indicates first differences of X – XL1 indicates the variable X lagged 1 year.