PATTERN PERSISTENCE IN EUROPEAN TRADE UNION DENSITY

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(abstract)

Analysing annual data on union membership, the authors examine the short- and long-term determinants of union growth and decline in post-war Europe. Using fixed effect estimates of an error correction model on a panel of fourteen countries, the authors incorporate structural, cyclical and institutional determinants. The results suggest that the common trend of union decline during the 1980s and 1990s is largely endogenous to labour market changes, the impact of which is mediated by a specific set of labour market institutions. In Europe, union density rates declined because unemployment increased, newcomers in the labour force were recruited or sorted into jobs and workplaces less covered by unions, inflation decreased and/or indexation clauses were dismantled, replacement rates were lowered, public employment shrank and strike activity declined. This accounts for diverging density rates across European countries, as well as for the aggregate downward cycle after 1980.

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Pattern persistence in European trade union density.
A longitudinal analysis 1950-96

1. Introduction

In 1991, the OECD published a survey of trends in union membership during the 1970s and 1980s (Visser, 1991). One of the main conclusions was that in the previous decade in all but few industrial market economies unionisation rates had fallen, in contrast with what had in Europe been the main post-war trend. Newer data show that the decline continued during the 1990s (Ebbinghaus and Visser, 2000) and is paralleled by three more interrelated indicators of weakening union power: declining strike participation rates, decreasing wage shares, and rising unemployment in Europe (Calmfors *et al.*, 2001). Not all countries shared in this decline and the already large cross-national variation in levels of unionisation – currently ranging from 10 per cent in France to over 80 per cent of wage and salary earners in employment in Sweden - increased during the 1980s and 1990s (Blaschke, 2000; Golden et al., 1999; Visser, 1993; Western, 1997).

[Figure 1 about here]

Our aim in this paper is to explain the common trends and national differences in the *development* of unionisation over time, with special attention to the apparent trend reversal in the early 1980s. We do therefore not attempt to find the best predictive model for union membership in each country. Explaining the different *levels* of unionisation would require a different approach, using historical data on strategic union organizing decisions, union-employer relations, cultural differences, and politics. Instead we look for *common determinants* of trends and cycles across countries, as if there were a 'common European model' for union participation.

The combination of trend reversal and divergence, shown in Figure 1, suggests that structural, cyclical and institutional factors are at work (Ebbinghaus and Visser, 1999). A common trend reversal suggests similar structural forces and cycles with roughly similar timing and impacts. Persistent and increasing cross-national differences are *prima facia* evidence that unions and union membership must be seen in the context of institutions specific to national labour markets. It is our ambition, in the analysis that follows, to build and test an explanatory model in which structural, cyclical and institutional determinants are integrated.

Many studies have studied trends in union growth by looking for time invariant patterns or by running cross-national regressions on multi-annual averages (Ebbinghaus and Visser, 1999; Lipset and Katchanovski, 2001; Visser, 1993; Wallerstein, 1989). By so doing they lose relevant information related to the potential existence of common dynamics, especially when referring to general phenomena like 'union decline' or 'membership stagnation'. For this reason we have decided to pool the available information in an unbalanced (time-series—cross-section) panel of observations. This is equivalent to considering each country as belonging to the same population (i.e. sharing the same time variation), while maintaining country-specific differences in the mean values of the variables. In addition, we show country-specific estimations, in order to check the validity of our general model. As a further test, we restrict the estimation sample to 1984 and predict 'out of sample', in order to assess whether union decline in the past fifteen years, represents an exception or can still be explained by our general model. In particular, our model predicts that densities will diverge after 1984, like they did in the actual world. Finally, we will contrast our analysis and results with three recent comparative studies in which union decline has been related to globalisation, political

change and institution decay (Scruggs and Lange, 2002; Oskarsson, 2001; Western, 1997). Before developing our main model, and introducing the data, we begin with presenting our conceptual framework.

2. Social custom theory

In democratic societies, workers' decisions are central to the analysis of union membership. Obviously, these decisions do not occur in a social vacuum but are influenced by the decisions and pressures of family and friends, co-workers, managers, employers, governments and union organizers (Hartley, 1992; Klandermans, 1986; Snow *et al.,* 1980). The most obvious answer to the question why workers join the union is that they want something that they cannot readily secure on their own: better wages and working conditions, financial gains, conflict insurance against the arbitrariness of employers, job security, social protection, a feeling of self-respect (Goldthorpe *et al.* 1968: 107; Guest and Dewe 1988; Van de Vall 1970: 125-29). Another reason for membership is social belonging – to be part and earn the respect of the group. Van de Vall (1970: 136) found that 'many workers join the union in order to occupy a psychologically safe position among the members of the group, i.e. in order not to be isolated or despised as a "parasite"'.

In social custom theory compliance with the norm of membership, despite ample opportunities for 'free-riding' (Olson, 1965), is seen as deriving from a reputation effect, which, in turn, depends on the beliefs and actions of significant others (Akerlof, 1980; Booth, 1985; Naylor, 1989; 1990). 'A social custom, once established, will persist, provided that disobedience of the custom results in sufficient loss of reputation, and provided that the cost of disobedience is sufficiently high' (Akerlof, 1980: 752). People who do not believe in the custom may nevertheless refrain from disobedience because of the consequences of loss of reputation among the rest of the community (Chaison and Dhavale, 1992).

It has been formally demonstrated that voluntary ('open-shop') unionism can exist at various levels of union density despite employer opposition and a potential free-rider threat (Naylor, 1989; 1990). A plausible hypothesis is that union density is a decreasing function of both the pecuniary cost of membership and the required amount of collective action or 'incremental sanctioning' (Coleman, 1990: 278) and an increasing function of the reputation effect (Corneo, 1997: 76). When the number of people complying with the norm increases, deviants are more readily punished, either because the punishment – ostracism and brandishing non-members as egoists – is more severe, or because the costs of sanctioning are lower to each. Booth and Chatterji (1993) formally show that there is a minimum level of unionism below which reputation effects will not work.

This approach helps to explain the intriguing fact of *diverging* unionisation trends across countries in spite of common challenges and shocks in the union's environment. Where union density is lower, the effectiveness of unions and reputation losses from non-membership will be weaker; fewer workers will be attracted, which in turn undermines the belief in the union needed for observance of the norm among new recruits or in the next generation (Akerlof, 1980: 755). Moreover, any fall in membership caused by a *temporary* shock is likely to be persistent and similar shocks (e.g., international recessions or political changes) have different impacts on union growth depending on the initial level of unionisation.

The empirical equivalent of this view is the existence of inertia or *hysteresis* in union membership levels found by Ebbinghaus and Visser (1999): when the appeal of

becoming union member depends, among other factors, on the extent of membership among co-workers, this implies that current density is (heavily) dependent on past density. In the limit, this corresponds to the property of *non-stationarity* in union density data.[1] But when a time series is non-stationary, it follows a random-walk dynamic, which rules out the convergence to an equilibrium level (except in the case of co-integrating vectors, i.e. long run relationships between the variables, whose residuals are stationary).[2] In the sequel we will show that national density rates are indeed non-stationary over the sample period (1950-1997). This raises the question whether the observed absence of convergence to a unique 'European' level of density is just a reflection of this property in the data or a real phenomenon.

As a first answer we have constructed Figure 2, in which we show the cross-country standard deviation of density rates (left-hand scale) and the Spearman rank correlation index (right-hand scale) between the sample average ranking and year-by-year ranking. This figure shows that, despite the increased divergence in union density rates after the two oil shocks and the financial turbulence of the 1970s (as shown by the increase in the standard deviation), the country differences in density levels, as shown by the rank order correlations, were even more enduring during the turbulent 80's and 90's than they were in previous decades.

[Figure 2 about here]

3. Model and variable selection

In the analysis below, we examine the effects of the changing environment for union organising – considering the impact of structural, cyclical, and institutional changes on the decisions of employees to join the union and on the ability of unions to recruit workers and sustain the social norm of membership.

Among the two main structural changes, seen from the perspective of union organizing, are, firstly, the decline of industry and of manual work, together with the rise of service and female employment, many of whom are secondary wage earners (Hakim 1996), and, secondly, the growing trade and financial openness of the economies of Western Europe, globally and through the completion of the Internal Market and the introduction of a single currency.

The major structural changes that in most of the Twentieth Century worked in favour of trade unions – the decline of agriculture and traditional household services; expanding public employment; and increased bureaucratisation of industry and services (Visser, 1990) – reversed in the past quarter century, given recent trends of privatisation, downsizing, outsourcing and flexibility in labour markets (Fellstead and Jewson, 1999; Standing, 1997). Approaching the problem of union organizing as an investment problem, establishing the union as an effective bargaining agent for its members, we must set the benefits accruing from additional members (financial resources, representation claims, bargaining power) against the costs of recruitment (Wallerstein, 1989). The marginal cost of recruiting new members will be increasing if workers who are easiest to organize – those in large firms, with stable employment relations and

[1] If DEN_t indicates current density rate, non-stationarity implies that $DEN_t = \alpha + DEN_{t-1} + \varepsilon_t$ where α is a drift and ε_t is a white noise.

[2] It is debated (and not yet solved) among econometricians whether series that are bounded by construction (as the density rate or the unemployment rate) can be properly defined as non-stationary.

established workplace representation rights, and from social backgrounds and with political views favourable to unionism – are already in the union.[3] Expanding or creating the unionism outside these customary domains is more costly for the union. Waddington and Whitston (1997) claim, on the basis of a survey of potential members in the UK, that the 'key explanation of non-membership appears to be the inability of unions to make contact with or provide sufficient support to, potential members'. Moreover, following the Marshall-Hicks rule, employers in the labour-intensive service sectors may be expected to offer more resistance against unions, unless the service is in fact a monopoly good (as in the public sector) and the costs can be passed on to consumers or tax-payers (Hirsch and Berger, 1983).

Thus, in all countries and in all years lower unionisation rates are observed in private services, small firms, among workers with flexible and unstable jobs, among 'secondary' wage earners, and those with small part-time jobs (Ebbinghaus and Visser, 2000). For connected reasons, female unionisation rates tend to be lower than male rates, except, in recent times, in Sweden, Finland and Denmark where (most) women have found stable employment in the public sector (idem).

Even without considering union organising efforts and employer opposition, it is more difficult to establish or uphold the social custom of membership in an environment where few others are already member. In a Dutch study of joining decisions, it was found that a ten per cent rise in the perceived union density rate in the establishment, increased the probability of joining by 17 per cent, all others things held constant (Visser, 2002: 417). Similarly, the probability of leaving the union is higher in workplaces with lower levels of membership and less frequent contacts with union officials (ibid.). These findings point towards divergence between unionised and non-unionised workplaces even in a country like the Netherlands where union recognition is guaranteed nationally and unrelated to the mobilising capacity of unions in the workplace (Visser and Hemerijck, 1997).

Time series analysis is not the most appropriate tool to investigate the existence of compositional effects on the evolution of aggregate union membership. However, we can approach compositional effects by considering the change in the participation rate (the labour force relative to the population), on the ground that an increase in this variable entails the appearance in the labour market of women, young workers, service workers, and individuals working under non-standard employment contracts. We expect therefore a negative relationship between rising labour participation and union growth, as it would increase the cost of membership. Rapid labour market change is likely to erode the social custom of membership, where it entails job decline in firms and sectors where unions are established and expansion in firms and sectors where unions have not gained the minimum level of organization. In order to prevent the mixing up of this variable with cyclical changes in unemployment, we shall use the employment rate in our regressions.[4]

The second main structural factor is related to the greater financial and trade openness, a factor that began to mark its difference from earlier years in the 1980s

[3] This is the basis for Hines (1964: 229) proposition that '…as membership increases there is a diminishing response to a given intensity of recruitment effort'.

[4] Formally, the unemployment rate UNE, the employment/population ratio EMPL and the participation rate PART are related as: EMPL = PART (1- UNE). It follows that if a higher participation rate has a negative impact on union density, then we should also expect a negative coefficient for the employment ratio. For reduced sub-set of countries and years, where information is available, we have also checked the impact of youth, female, temporary work, part-time and private sector service, finding a negative impact for all these variables except in the case of part-timers (see Calmfors et al. 2001, tables 2.8 and 2.9).

(Cerny, 1994; McKeown, 1999). Our indicators of openness are based on objective measures, based on national accounts and financial statistics, weighing the size of exports, imports, foreign investments and currency instability (Quin and Inclan, 1997; Scharpf and Schmidt, 2000). Unfortunately we have no comparative time series data referring to feelings of insecurity relating to globalisation among workers, which would probably better pick up whether the demand for union protection has increased, especially among workers disadvantaged by global trade and investment patterns. Like other researchers (Scruggs and Lange, 2002; Oskarsson, 2001), we hypothesise that globalisation (measured either by trade opening or by financial liberalisation) is detrimental to union membership, as it sets narrower limits to union bargaining power and, consequently, to the collective and individual benefits that unions can produce for (prospective) members.

Among the cyclical factors, like most authors in the field we consider the role of unemployment, inflation, and political moods and cycles. Unemployment, by shifting market power onto the employer, makes it more difficult for unions to accomplish their goals and potentially increases worker dissatisfaction with the union. From a pure statistical viewpoint, the union density rate, measured as a proportion of the *employed* dependent labour force[5], should be unaffected if unemployment were randomly distributed among the workers. There are likely to be strong compositional effects, however. From panel studies in the United Kingdom and the Netherlands we learn that workers who become unemployed tend to end their membership, in particular when they experience or anticipate long unemployment spells (Elias, 1996; Klandermans and Visser, 1995). However, if workers with limited employability and higher risks of becoming unemployed stand to benefit more from the union and are more inclined to become union members (Booth, 1984) and if actual unemployment affects these workers more than others, than a rise in the unemployment rate will be associated with a decrease in the aggregate union density rate. On the basis of common knowledge of the distribution of unemployment and union membership in Europe since the 1970s, affecting older male workers in industry (Layard et al., 1991; Ebbinghaus and Visser, 2000), this negative result is the most likely one.

There is, however, one situation in which we are able to control for compositional effects. This is where unemployed members retain their membership. That would appear to be the case when the union operates a private (though publicly subsidized) unemployment insurance scheme, as is the case in Denmark, Finland and Sweden, or when the union administers the admissions and claims in the statutory system, as in Belgium (Holmlund and Lundborg, 1999; Rothstein, 1992). In countries with the Ghent system of unemployment insurance, so named after the Belgian town where it was first introduced, unemployed members, like workers who anticipate unemployment, have reason to retain their union membership or join the union (if the insurance scheme accepts them). Even where union membership is no longer a qualifying condition for eligibility to benefits under such a scheme, if the union operates the scheme and case handling is processed through the union, risk aversion would induce workers to join the union. Hence, in Ghent countries unionisation levels tend to be higher for any given level of unemployment and union membership is likely to increase in times of rising unemployment, whereas in non-Ghent countries the opposite effect is expected. We treat this institutional variable by interacting it with the unemployment rate. Another variable to be considered in this connection is the income replacement rate

[5] We have excluded the unemployed from both the numerator and the denominator of the density rate to increase the comparability across countries, given different definitions in unemployment applied by national statistical offices.

for unemployed worker. We anticipate that where the replacement rate is high, the union will be seen as more effective in its protective role.

An objection to our treatment of the relationship between unemployment and unionisation is that unemployment could be taken as an effect rather than a cause of union growth.[6] We have considered two alternative routes to deal with this problem of endogeneity: either we lag the independent variable (today's unionisation is affected by yesterday's unemployment, thus preventing reverse causation) or we instrument the independent variable (today's actual unemployment is replaced by its prediction based on instruments). In this paper we follow the first strategy.

Inflation is another source of uncertainty. Since most collective labour agreements are negotiated for one year, sometimes even longer, consumer price increases may not be anticipated and erode workers' income. According to Bain and Elsheikh (1976), following Marxian union theory, the erosion of real income is a major motive for workers to turn to the unions and to union action in an attempt to defend their living standards. Under conditions of high and accelerating inflation – as happened in many European countries in the 1970s, workers should demand either very short contracts or cost-of-living adjustment or indexation clauses. We expect union density to rise with rising inflation, in particular where workers see unions as effective in defending their income, i.e. where they have negotiated cost-of-living adjustment clauses in wage contracts. However, the inability of unions to defend the purchasing power of wages, for example unions being unable to impose indexation clauses, is expected to generate dissatisfaction with the union and higher leaving rates and, consequently, a lower unionisation rate.

We have also considered changes in the real wage rate, as has been done in a number of studies on business cycle effects on union growth, though with deeply contrasting results (e.g., Bain and Elsheik, 1976; Schnabel, 1989; Roche and Larragy, 1990; van Ours, 1992). Unlike the situation in the United States (Freeman 1986), European trade unions negotiate wage rates that are applied equally to members and non-members. In most countries bargaining coverage rates are far 'in excess' of membership rates (Calmfors et al., 2001; Traxler et al., 2001). Consequently, it is problematic to assume that workers want 'to reward' the union, and join, because of a rise in nominal or real wages (Bain and Elsheikh, 1976; Schnabel, 1990).

Additionally, we have considered changes in the political climate (swings to the left or the right), waves in strike participation and the composition of the government, variables that have played a considerable role in both the older and newer literature (Kelly, 1998; Korpi, 1984; Lange and Scruggs, 1999; Western, 1997). Voting for the left cannot properly be treated as a cause of union growth, but it may be seen as a proximate cause, indicating a change in the mood in favour of the kind of policies unions are usually associated with. In other words, one might expect to see a positive association between the left vote and union growth. Alternatively, we may see union membership and left voting also as compensating forces, with workers turning to the unions if they feel their interests threatened by a political swing to the right. Given this ambivalence, we shall have to approach this relationship empirically.

Considering the role of strikes, our key hypothesis is that the participation of workers in strikes expresses a rising demand for union activity. Strike participation may be seen as indicating greater solidarity, and more willingness to defend the social custom of membership, among workers (Checchi and Corneo, 2000). The monetary incentive of

[6] Both Nickell 1997 and Blanchard and Wolfers 2000, exploring the impact of labour market institutions on unemployment, treat the unemployment rate as the dependent and union density as the independent variable.

strike payments, offered by unions in Northern Europe and German-speaking countries (Visser, 1990), should attract risk adverse workers to the unions, especially in industries and occupations were strikes are common. We do therefore expect a positive association between strike activity (measured by relative participation of workers in strikes, measured per 1,000 workers) and union growth.[7]

Finally, we turn to the remaining institutional variables. (We have already discussed the role of unemployment insurance and indexation, as they are interacted with unemployment and inflation respectively.). Here we need to consider union representation in the workplace and the organisation of collective bargaining and the social dialogue with employers and governments—variables that have persistently come up in cross-national analysis of trends in union growth (Ebbinghaus and Visser, 1999; Golden et al., 1997; Scruggs and Lange, 2002; Western, 1997).

With the social and spatial differentiation of living and working environments, it is mostly in the workplace, amidst pressures from co-workers, managers and union organizers, that the social custom of membership is upheld (Streeck, 1981; Windolf and Haas, 1989). The workplace appears to be the main locus to recruit new members ('members recruit members') and offer membership-related services other than insurance (*e.g.* grievance handling) (Hancké, 1993). Protection and support in case of conflict with management is often cited as the main reason why workers join the union (Klandermans and Visser, 1995; Waddington and Whitston, 1997). To understand the role of local unions or works councils in recessions, we must further bear in mind that in many European countries local management is under obligation to negotiate or consult with local unions or works councils over restructuring plans and lay-off schemes. Where such controls exist union representatives favour the workers on whose vote or support they depend (Hohn, 1991; Streeck, 1981). Strong workplace representation not only affects the selective benefit of membership in recruitment or lay-off decisions, it also affects the cost of joining. If workplace organization establishes a strong custom of membership the costs of non-membership (harassment by fellow workers) may in fact become significant. For these reasons we expect that union membership will be higher, and union growth stronger, wherever unions have strong institutional support for representation in the workplace.

In industrial relations systems in which union-management bargaining is conducted at the level of industries and recognition rules are established nationally rather than granted on a firm-by-firm basis, employers have less reasons to oppose union membership (see Corneo, 1995, for a formal presentation of this claim). Visser (1991) argues that higher-level bargaining is likely to weaken employer resistance to union organizing, partly because the union mark-up on wages will be lower than under single-employer bargaining (see also Freeman, 1986). [8] On the other hand, centralisation of wage bargaining tends to associated with less participation of members in decision making in the union and to exacerbate free rider effects (van de Vall, 1970). Which of these effects is strongest is hard to say. It is probably the combination of workplace representation and centralisation that is most beneficial for unions (Oskarsson, 2001; Ebbinghaus and Visser, 1999), whereas centralisation without local presence may deepen feelings of detachment and frustration (Hancké, 1993; Klandermans and Visser, 1995).

Table A summarises our theoretical expectations, listing the variables and the expected relationship on the costs, benefits, and social custom of membership.

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7 Since we are interested in explaining trends rather than levels, we have standardised the strike-data by taking Z-scores per country, concentrating on strike waves or lulls above or below the national average.

8 A corollary finding, not studied here, is that the variation in union density rates across industries and across firms is lower under conditions of centralisation (Visser 1990).

Table A: Variables and expected relationships

	benefit of union membership	costs of union membership	social custom, membership norm	Δ union density
Structural				
employment ratio (EMP)			weaker	-
share manufacturing			stronger	+
share manual			stronger	+
share female			weaker	-
share youth			weaker	-
share flexible/part-time			weaker	-
public sector employment (PA)	higher	lower		+
trade or financial openness (OPEN)	lower	higher		-
Cyclical				
unemployment rate (UNE)	lower	higher		-
inflation rate (INFL)	?			?
strike participation rate (SPART)	?	?	stronger	+
political climate / % leftvote (LEFTV)	?	lower		+
Institutional				
union administered unemployment insurance (GHENT)				
unemployment rate x GHENT	higher			+
automatic wage indexation (INDEX)				
inflation rate x INDX	higher			+
replacement rate (BENEFIT)	higher			+
workplace representation (WORK)	higher		stronger	+
centralisation wage setting (CENTR)		lower	?	+?

4. Data description

The data utilized in the present analysis have been collected with the main concern of comparability across fourteen European countries.[9] Union density rates are taken from Ebbinghaus and Visser (2000) and relate to *net* density rates, excluding members who are unemployed or retired, and computed on end-year or average-year data on workers and salaried employees in employment. The labour force data are from the OECD's Labour Force Statistics. Table 1 presents the essential data on the time period and mean values. A full description of the data and data sources used for the independent variables is presented in the appendix.

[Table 1 about here]

Union density rates are presented in Figure 3, both in levels and first differences. The augmented Dickey-Fuller tests for union density and most of the other variables in our model indicate that most series are non-stationary. First-differenced variables are

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

mostly stationary, however (Figure 4).[10] In addition, normality tests do not reject the assumption of normality for the first differenced variable.

[Figures 3 and 4 about here]

This points in the direction of persistence in union density rates: current density equals last year density plus an error component. In addition, non-stationarity of our explanandum fails all ordinary statistics based on the assumption of bounded variances (like ordinary least squares) and requires alternative strategies of estimation. In fact, the potential existence of co-integrating relationships (i.e. long run linear relationships among the variables) suggests us to represent the data generating process as an error-correction mechanism, thus allowing the distinction between short-term effects and long-term determinants.[11]

[Table 2 about here]

When we search for a long-term relationship between union density DEN and any another variable or a group of variables, for example the unemployment rate UNE, we would like to test the validity of the following formulation

$$DEN_t = \alpha_0 + \alpha_1 UNE_t + u_t \qquad (1)$$

where u_t is a random disturbance. If equation (1) cannot be directly estimated because of non-stationarity of the independent variable, using first differences can overcome the problem (conditional on first differences being stationary):

$$\Delta DEN_t = \alpha_1 \Delta UNE_t + (u_t - u_{t-1}) \qquad (2)$$

Equation (2), however, 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*. However, when some dynamic adjustment is added to equation (1), as in, for example,

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

the same equation (1) can be rearranged as in the error correction mechanism representation[12]:

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

$$= \beta_0 + \beta_1 \Delta UNE_t - (1 - \beta_2) \left[DEN_{t-1} - \left(\frac{\beta_3 + \beta_1}{1 - \beta_2} \right) UNE_{t-1} \right] + u_t \qquad (4)$$

or using a more compact notation:

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

The estimated coefficient $\hat{\gamma}_1$ can be taken as the *short-term* effect and the computed value $(-\hat{\gamma}_3 / \hat{\gamma}_2)$ as the *long-term* effect of UNE upon DEN. In addition $|\gamma_2|$ is a measure of

[10] The use of first differenced variables eliminates the problem of non-stationarity in all cases but three: Italy, Great Britain and Denmark. In addition, using first differences allows us to avoid the use of logistic transformation in order to obtain normally distributed residuals (as proposed in Booth 1983).

[11] See Engle and Granger 1987. For a similar approach see Carruth and Disney 1988, Carruth and Schnabel 1990 and van Ours 1992.

[12] See Harvey 1981.

the *speed of convergence* in the long-term relationship; $\gamma_2 < 0$ implies convergent, $\gamma_2 > 0$ divergent behaviour. [13]

All our independent variable means are reported in Table 1; pair-wise correlation coefficients and available observations are reported in Table 3. Inspecting the correlation coefficients in the first column of Table 3, we notice that (the level of) union density is negatively associated with unemployment and positively with inflation and employment. More straightforward is the positive correlation with public employment and with the generosity of welfare systems measured by the replacement rate. Finally, the centralization measure, strike participation and left voting exhibit positive signs in correlation with union density. However, when we consider the first differenced variables in Table 4, some correlations change sign unemployment and employment, as well as left voting. In all cases, these could just be spurious correlations and multivariate analysis is required to establish the value of this evidence.

[Tables 3 and 4 about here]

5. Results

In Table 5 we report our main results. We estimate a least square fixed effect model, to allow for unobserved country differences. The estimation period is 1951-1996, with some exceptions due to missing data.[14] Our preferred model is reported in the first and second columns. (In the other columns we experiment with alternative specifications.)

We start with the cyclical factors and find that the unemployment rate (variable UNE, lagged one year in order to rule out potential endogeneity) has a negative impact on density in both the short and the long run. However for Ghent countries the impact is positive in the short and the long run. With respect to inflation INFL, the actual change in the inflation rate (i.e. consumer price acceleration, which is often used as a proxy of expected inflation) has a negative impact, but turns beneficial to union growth when automatic cost-of-living clauses are present, though effects are much smaller than in the case of unemployment.

Alternative measures for perceived (cyclical) risks are proposed in the third column, where we use a 3-year moving average standard deviation for unemployment and inflation as proxies for instable labour markets and income insecurity. As expected, the effect of unemployment variability, which appears related to high levels of

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[13] In the specific case of the unemployment rate (as for any other labour market variable) finding significant estimates for the coefficient γ_1 cannot be taken as evidence of a causal link running from unemployment to union density, since we must consider the possibility that trade unions influence or cause unemployment rather than the other way around. We have two alternative routes to deal with this problem of endogeneity: either we lag the independent variable (today's unionization is affected by yesterday's unemployment, thus preventing reverse causation), or we instrument the dependent variable (today's actual unemployment is replaced by its prediction based on other instruments). Under the first alternative, which is our preferred strategy in this paper, the general form of the estimated model is

$$\Delta DEN_t = \beta_0 + \gamma_1 \Delta UNE_{t-1} + \gamma_2 DEN_{t-1} + \gamma_3 UNE_{t-2} + u_t \qquad (5 \text{ bis})$$

where all values of *UNE* (and other labour market variables for which the same argument about causal reversibility can be made) have been lagged one year. The alternative route of instrumental variables has been explored in Calmfors *et al.* 2001, using 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 all cases unemployment preserved its (negative) sign and in most cases its significance.

[14] Due to missing values, we have reduced the samples for four countries: Belgium 1951-95, Ireland 1956-96, France 1960-96 and Spain 1981-96.

unemployment, is strongly negative. It runs against the stability condition on which the social custom of union membership is based, and it is a sign that unions may be ineffective in protecting employee interests. Variation in inflation rates does not have a significant effect.

In the fourth and fifth columns we follow suggestions from the literature (Scruggs and lange, 2002; Oskarsson, 2001) and introduce proxies for increased globalisation. The variable OPEN (export and import over gross domestic product) measures the degree of trade openness, whereas the variable KCONTR reports a qualitative measure of financial liberalisation: the development of union density seems unaffected by both of these two measures of globalisation, however.

Additional variables affecting the demand for union protection are introduced by interacting variables. We have already mentioned the fact that rising unemployment is associated with union growth in "Ghent" countries (variable GHENT×ΔUNE), because the private (appropriable) benefits from joining a union are clearly perceived in that context. Similarly the generosity of the unemployment benefit (variable GHENT×ΔBENEFIT) raises the value of union provision in these countries. We have interacted the inflation rate (variable INFL) with the presence of an automatic indexation system (variable INDEX), finding that the demand for union is enhanced when purchasing power is menaced, but unions are capable of defending workers' wages with cost-of-living clauses.

We observe that this group of variables constitutes a long-run equilibrium. Unemployment rate has a negative impact in non-Ghent countries and a positive one in Ghent countries; inflation raises density only when indexation clauses are present, and, all other things equal, raising the replacement rate by 10 percent points yields an increase in union density by 5 percent points.[15] Using point estimates of the first column of Table 5, the long run equilibrium density appears determined as

$$DEN = -6.26 \cdot UNE_{t-1}^{nonGhent} + 0.86 \cdot UNE_{t-1}^{Ghent} + 1.08 \cdot INFL \times INDEX + 0.52 \cdot BENEFIT$$

where $UNE_{t-1}^{nonGhent}$ bears the coefficient corresponding to UNE_{t-1} while UNE_{t-1}^{Ghent} displays the composite effect of $UNE_{t-1} \times GHENT$.

[Table 5 about here]

We take into account the role of electoral cycles in the sixth column of Table 5. Taken at face value, the estimated coefficient indicates that a rise of left votes in the order of 10 per cent is accompanied by a simultaneous decline of union density of 0.6 per cent. Though the impact is rather limited, it is clearly negative.[16] One possible explanation, suggested in our theoretical section, is that left parties act as (partial) substitutes in the demand for union representation of solidarity values.

Strike participation (measured by the normalised ratio of strikers to the dependent employment), on the other hand, has a positive impact, as expected and confirming that strike activity can be seen as contributing to bolstering the norm of

[15] As a result of dividing the coefficient of the lagged replacement rate (0.012) by the coefficient of the lagged density rate (0.023).

[16] We experimented with several specifications in the search for a positive impact of left voting on union density, as obtained among others by Korpi, 1984; Scruggs and Lange, 2002 and Western, 1997. However, we were able to find a positive impact only in a model estimated in levels without country fixed effects and without the inclusion of workplace representation in the model. This raises doubts about potential spurious correlation in the results presented in the literature.

union membership. The estimated coefficients are robust even when controlling for year fixed effects.

Turning to the structural variables, the greater difficulty of union organizing in the case of commercial services and newcomers (the young; secondary earners) is witnessed by the negative sign obtained for the employment rate (ΔEMPL). Given an estimate of nearly 0.3 on the first differences, it suggests that a 10 percent increase in the employment rate (as experienced in for instance the Netherlands or Ireland in the Netherlands between 1986 and 1996) entails a reduction in density of 3.2 percent, other things held constant. The other compositional variable, the share of public employment (ΔPA), comes also out positive and significant.

Of the institutional variables, workplace representation (WORK) is strongly significant. In the hypothetical case of a country changing its legislation from prohibition to full recognition of workplace representation, union density should start growing by an additional 1.7 percentage points per year, which is a very considerable figure. The reverse situation occurs when the same rights were fully curtailed. Italy, with the promulgation of the *Statuto dei Lavoratori* in 1970, and Great Britain, after the rise to power of Mrs. Thatcher, represent textbook example of this type of dramatic change, and it is not by accident that the coefficients for this variable are very significant in our country-level estimations for both countries. Centralization (CENTR) has also a significant, positive and robust impact on unionisation. In the unlikely case that centralized bargaining would collapse overnight, and be replaced by fully decentralized (single-employer) bargaining, union density would decrease by 1.6 percent points on a yearly basis, other things equal.

On the whole we think that our model fits the data rather well. However, specification tests (Durbin-Watson and Lagrange multiplier tests) still suggest the presence of serial correlation in the residuals, whereas Hausman tests (not reported) indicate that a random effect estimator is not a better alternative. The validity of our model can also be appraised by looking at static predictions (without cumulating prediction errors) and dynamic predictions (cumulating prediction errors), respectively reported in Figures 5 and 6.[17] It is interesting to note that our predicted values at the national level still produce an aggregate cycle, with divergent patterns towards the end of the period—conforming to what is observed (see figure 7).

More impressive, we believe, is that the model exhibits dynamic stability, even though it regresses to the long run equilibrium at very low speed: it takes some 40 years to reach the theoretical steady state implied by the long run vector.[18] In table 6 we have re-estimated the same model using sub-samples. For ease of comparison, the first column restates our preferred model estimated over the entire sample; the second column restricts the sample to the pre-oil shock period (1950-75, when density was rising in most countries); the third column uses the post-oil period (including the turbulent late 1970s, when union density started to decline); in the fourth column we restrict the estimation sample to the years before 1985 in order to produce the 'out of sample predictions' reported in figure 8. One could also say, that this period corresponds with the phase in which trade unions have to come to terms with the realities of service employment, global competition and permanent austerity in the welfare state (Iversen, 2001; Pierson, 2001; Stephens et al., 1999).

Most of the estimated coefficients retain their sign and significance, even if it is possible to recognise some differences. Inflation was crucial for union joining during the

[17] Apart from four dummies accounting for changes in definition of the dependent variable, we do not make use of additional adhockery to improve the statistical fit.

[18] This helps to explain why we find non-stationarity (i.e. absence of convergence to any long run value) in a 47 observations sample for each country.

first sub-period, but looses significance in the second one (a similar finding was anticipated and discussed by Price, 1989). This suggests a fundamental change in labour market behaviour and wage setting in the two periods (probably connected to the change in monetary policies: see Iversen, 1999). Contrary to our expectation and to the argument advanced by Hancké 1993, workplace representation would seem less important for union growth in the post-oil shock period. We can only speculate that this reflects a composition effect: in a time of decentralising tendencies (Calmfors et al. 2001), union workplace representation is more important, but less available. Possibly reflecting the growing instability in employment contracts, employment growth turns out to be more negative for union growth after 1975, while the importance of public employment has increased.

Moving to our 'out of sample' predictions and inspecting these predictions in differences (Figure 8) and in levels (Figure 9) we observe that our model performs well in the case of most countries, though it has some tendency to over-predict the actual development of unionisation, notably in the cases of Denmark (+ 4 percentage points), Ireland (+10), Austria (+10), Switzerland (+4) and Spain (+12).

As for the long-run properties of our model, we have estimated alternative linear square specifications of the long-run relationships, testing the stationarity of the predicted residuals (table 7). We find evidence of the existence of at least one (co-integrating) long run relationship between the union density rate, the unemployment rate, inflation rates and unemployment benefits, especially when interacted with their institutional context (Ghent countries, indexation clauses). As it can be observed by the Dickey Fuller p-value tests reported in the bottom line, the introduction of additional regressors in the co-integrating relationship weakens the stationarity of the predicted residuals.[19]

We have performed two other robustness tests. In Table 8 we have repeated our preferred estimation leaving out one country in turn. This allows us to double check that the slow speed of convergence, the negative impact of unemployment (both in the short and in the long run), the positive impact of Ghent-type institutions, the positive effect of centralisation and workplace representation, and the negative short run effect of rising employment are indeed robust against potential outliers.[20] All the other variables mentioned above seem attributable to some (but not all) countries, as they are less significant under some exclusion. It is still reassuring that we do not observe sign reversal under this test, which is further evidence of the generality of our model.

A more stringent test is proposed in table 9, where the general model is estimated country by country, and we have retained the coefficients with a p-value below 0.4.[21] Here again we find that unemployment has a positive impact on density in Ghent countries, and negative otherwise. Less robust is the evidence on the role of inflation, which similarly tend to exert a negative impact on density, independently from the existence of a wage indexation system (the atypical case being Austria). Strong evidence of a role played by unemployment benefits comes from Sweden and Germany. Among the compositional variables, the employment rate is rather robust in having a negative

[19] We recall that these tests for co-integration are designed for balanced panels and must therefore be considered as an approximation of the asymptotic values.

[20] However it is interesting to note that the coefficient on workplace looses significance when Italy is excluded (column 6). Italy is probably the country with the most dramatic change in pre- and post-1970 workplace representation and dismissal protection (Giugni, 2000).

[21] We present the regression on Spanish data; however, this regression nearly exhausts the degrees of freedom, and therefore provides only descriptive evidence.

impact, whereas the public employment share receives its strongest support in Germany, arguably the country with the strongest statute on civil service (see Blanpain, 1993). Countries showing a significant positive impact of (changes in) workplace representation are Italy and Germany, whereas the case of Ireland is controversial. In the country-specific runs of the model we find a significant and strong impact of centralisation in the case of Finland, Belgium, Great Britain, Germany, Netherlands and France.

6. Relationship with related literature

Many authors have estimated cross-sectionally union density averages or long-run changes in these averages.[22] The general finding is that Ghent countries, workplace presence and socio-democratic orientation of the government correlate positively with union density, even when very different countries like the United States, Australia, Japan and Israel are included in the sample. Fewer authors have used longitudinal models to analyse the same problem. In the recent literature, we are aware of three major books or papers following a research line similar to ours (Western, 1997; Scruggs and Lange, 2002; Oskarsson, 2001). Each work estimates models of union density using pooled cross sections of several countries and each uses the same sources and methods for measuring the dependent (union density) variable as we do. It is therefore pertinent to compare our results with theirs.

Western (1997) estimates union density for 18 countries over the period 1950-85. He finds a significant role for cyclical variables (negative impact of unemployment and positive for inflation) and for compositional ones (negative impact of labour force growth). In addition, he reports a positive correlation with strike volume and left representation in the government. His model is estimated in first differences without an error correction component. His results, therefore, describe short-term effects only. Western deals with the role of institutions by partitioning the sample into 'high-density countries', 'middle-density countries' and 'low-density countries', or rather into 'Ghent countries' or even 'centralization countries'. Finding a consistent pattern for subgroups of countries allows him to claim that '...institutions can assist the growth of labour movements in good times and bad. Where unions manage unemployment insurance funds, rising joblessness has not threatened union membership rolls' (Western, 1997: 120). In addition, union growth is stronger in left governed countries and in countries with centralized wage bargaining systems.

Both Scruggs and Lange (2002) and Oskarsson (2001) are concerned with the impact of globalisation on labour movements, and specifically with the absence of convergence in national institutions in spite of a common trend of globalisation. Scruggs and Lange estimate a short-term model in first differences[23] for 16 countries between 1960 and 1989. While controlling for cyclical variation (GDP growth rate, unemployment rate, government partisanship) and structural change (public employment and labour force growth), they are mainly concerned with the impact of globalisation, which they measure by the share in GDP of foreign trade, foreign direct investment and financial liberalization. The authors deal with the institutional aspects by creating a single measure of 'union compatible institutions', which is the sum of three indicators (as identified by Ebbinghaus and Visser, 1999): Ghent, bargaining centralization and workplace representation. This variable is then interacted with all regressors. The paper's main

[22] For two recent attempts and overviews of the literature: Lipset and Katchanovski, 2001 and Ebbinghaus and Visser, 1999.

[23] Their model cannot be interpreted as an error correction model, since they introduce only the control variables (but not the endogenous one) in lagged levels.

finding is that increased financial openness is associated with increasing density in countries with 'union compatible institutions', whereas it is detrimental to unions where these institutions are absent or weak.[24]

In similar fashion, Oskarsson (2001) proposes an 'institutional index', which is the product of centralization and workplace representation summed to a dummy for Ghent countries. His central claim is that '... it is the combination of centralized bargaining and locally strong and present unions that can exert positive influence on the union density level' (Oskarsson, 2001: 9). Estimating an error correction model over the period 1970-94 for 15 countries and interacting all variables (both in difference and in levels) with his institutional index, Oskarsson finds that unemployment has an opposite impact in Ghent and non-Ghent countries, both in the short and in the long run. Analogously, net foreign direct investment has also a contrasting impact: capital exporting is favourable to unions in highly institutionalised countries, whereas capital importing favours unions in weakly institutionalised countries. Inflation has a positive impact, both in the short and the long run, independently of institutionalisation. He reports additional short-term effects for government employment (positive), services (negative) and financial liberalization (negative).

With respect to these findings, our model suggests several improvements. Firstly, it lengthens the sample size significantly, by including two additional decades (1950s and 1960s, which are rarely studied for lack of appropriate data) and some additional years in the mid-1990s. Secondly, we allow for greater variety of labour market institutions: Ghent unemployment insurance, wage indexation, bargaining centralization, workplace representation, and unemployment benefits (replacement rates). But we avoid creating a single measure for these institutions, since we find it highly unlikely that labour market institutions can be ranked along a one-dimensional scale and do not want to rule out that each institution has a different role to play, independently from the others. The problem with the papers by Scruggs and Lange (2002) and Oskarsson (2001) is that pro-union institutions are measured along a unique dimension, which is rather time invariant. Without interaction with regressors, this would be equivalent to estimating a country specific fixed effect and consequently its explanatory contribution would be undistinguishable from introducing a set of country specific dummies. Since the single institutional variable varies between 0 (weak institutions) and 1 (strong institutions), when interacted with the regressors, this corresponds to testing that the regressors are only relevant for strongly institutionalised (pro-union) countries, and irrelevant for the others. But this does not help us to understand how labour market institutions influence union organizing in every country.

Unlike the other studies, we have found that electoral behaviour has a negative impact whenever we control for labour market institutions and (remaining) country fixed effects. In a social custom context, we have put forward a possible trade-off between joining a union and voting for left parties as and alternative rather than complementary ways to express pro-labour attitudes. This finding clearly needs more micro-level research. We have deliberately avoided the inclusion of the political orientation of governments among our regressors, since we do not believe that the political orientation towards unions can be meaningfully measured in a single dimension. Rather we believe that a government that introduces, or improves upon, union-run unemployment benefit schemes, indexation clauses, bargaining centralization, stronger workplace representation

[24] By way of control, we have introduced their measure of financial openness (taken from IMF Financial Statistics and reported in Scharpf and Schmidt, 2000) in the fourth column of Table 5. As can be seen, the variable has the expected negative sign (since it varies from 0=full control of capital movements to 1=absence of controls), but is statistically insignificant.

rights and higher replacement rates, is pro-union. Nowadays, such governments are rare and may be both right and left of the political centre. Since we are already controlling for each of these interventions, there is no need for an additional 'catch all' variable. The direct measurement of institutional variation, through policies rather than government composition, is therefore more precise.

We have also made improvements in the set of the additional regressors that have been introduced. Strike activity is not measured by strike episodes (as in Western, 1997) or by strike volume (working days lost), but by strike involvement or number of workers (per 1,000 workers) participating in strikes (see Shalev, 1992). We believe that this variable captures best the social custom effect that we want to measure (Checchi and Corneo, 2000). In addition, it also indicates the mobilizing of resources available to union leaders and, indirectly, the relative power that unions can bring to bear. Centralisation is measured as a true variable, capturing the coordination capacity of trade unions, as proposed by Visser (1990) and refined by Iversen (1999).

Last but not least, our model is robust in several respects, as shown by the sample split estimation, by the country exclusion, by the country-by-country estimations, and the 'out of sample' predictions.

7. Conclusions.

The results of our analysis suggest that union decline in the 1980s and 1990s can be depicted as endogenous to labour market changes, but that the impact of these changes is clearly mediated by labour market institutions. Our simulation indicates that, in Europe, union density rates declined because unemployment went up (with a differential effect in Ghent countries), newcomers in the labour force were recruited or sorted into jobs and workplaces less covered by unions, inflation decreased and/or indexation clauses were dismantled, replacement rates were lowered, public employment shrank and strike activity declined. This accounts for diverging density rates across European countries, as well as for the aggregate downward cycle observed in the sample period.

A higher employment/population ratio, bringing into employment more people with lower qualifications or less stable commitments to the labour market, is likely to hurt the unions, both in the short and in the long run. Although it is impossible to fully disentangle the separate contribution of the demand for union protection and union supply, our analysis suggests that the eroding networks and 'broken ties', caused by instability and change in employment and rising unemployment, made it more difficult for unions and union activists to 'uphold the norm of membership'.

Our model, although indicating a stable dynamic relationship in the long run, suggests that convergence occurs at rather low speed – only around 2.5 per cent of the deviation of the long-run relationship is eliminated each year. This has implications for the interpretation of the results. The low rate of adjustment would seem to imply that, in particular, the rise in European unemployment in the 1980s and 1990s did not yet have its full impact on unionisation. In other words, a return to lower unemployment in coming years does not necessarily imply a return to union growth.

The main limitation of our analysis is that we have treated the trade unions as 'passive' organizations, on the receiving end of structural, cyclical and institutional changes. The policies of unions, their organisational structure, their overall approach and ideology (social partnership or confrontation), and the quantity and quality of union services are omitted from this analysis. Case studies in the effects of union campaigning, and pair-wise comparisons of unions with different approaches might add important insights. Union structure, mergers and take-overs, and inter-union competition, is another area that might fruitfully be explored (see Waddington and Hoffmann, 2002).

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

	Finland	Belgium	Sweden	Denmark	Norway	Italy	Great Britain	Ireland	West Germany	Nether lands	Austria	France	Switzer land	Spain
SAMPLE	51-96	51-95	51-96	51-96	51-96	51-96	51-96	56-96	51-96	51-96	51-96	60-96	51-96	81-96
DEN	0.572	0.460	0.748	0.679	0.533	0.381	0.471	0.572	0.338	0.337	0.544	0.173	0.304	0.135
UNE	0.065	0.087	0.026	0.070	0.044	0.109	0.060	0.104	0.062	0.055	0.025	0.084	0.007	0.216
GHENT	1	1	1	1	0	0	0	0	0	0	0	0	0	0
EMPL	0.466	0.372	0.486	0.467	0.430	0.371	0.443	0.340	0.432	0.365	0.429	0.392	0.510	0.301
INFL	0.064	0.039	0.058	0.054	0.055	0.077	0.065	0.073	0.029	0.039	0.040	0.061	0.031	0.072
INDEX	0.355	0.818	0.444	0.666	0.800	0.755	0.088	0.250	0.000	0.266	0.000	0.000	1.000	0.000
WORK	0.840	0.800	1.000	1.000	1.000	0.560	0.662	0.415	0.511	0.311	0.600	0.355	0.200	0.400
CENTR	0.383	0.526	0.648	0.429	0.452	0.220	0.141	0.306	0.257	0.449	0.677	0.110	0.182	0.210
SPART	0.117	0.020	0.010	0.030	0.009	0.367	0.048	0.039	0.007	0.005	0.013	0.106	0.000	0.276
BENEFIT	0.220	0.422	0.199	0.431	0.177	0.037	0.228	0.236	0.286	0.339	0.159	0.289	0.120	0.333
PA	0.199	0.198	0.270	0.266	0.246	0.137	0.205	0.205	0.140	0.160	0.138	0.269	0.140	0.124
LEFTV	0.443	0.350	0.505	0.460	0.482	0.399	0.401	0.156	0.401	0.353	0.486	0.442	0.287	---
OPEN	0.504	1.115	0.547	0.630	0.830	0.343	0.467	0.982	0.446	0.933	0.623	0.381	0.668	0.385

Legend:

DEN = union net density (active dependent members, excluding unemployed or retired)
UNE = unemployment rate (unemployed/labour force)
GHENT = existence of union-administered unemployment benefit schemes
EMPL = employment rate (employed/population)
INFL = inflation rate (consumer price index)
INDEX = existence (and extent) of automatic wage indexation clauses
WORK = existence (and extent) of workplace representation rights for union activists
CENTR = degree of centralization in wage bargaining
SPART = strike participation (strikers/employees).
BENEFIT = replacement rate (unemployment subsidy/average wage)
PA = governmental employment share in dependent employment
LEFTV = percentage of votes to left parties in general elections
OPEN = openness to external trade = (import+export)/gdp

Table 2: Augmented Dickey Fuller tests for non stationarity in panel data – 1950-98

pvalues associated with no cointegration

	levels	first differences
DEN	0.99	0.00
UNE	0.98	0.00
EMPL	0.94	0.00
INFL	0.00	0.00
CENTR	0.05	0.00
SPART	0.00	0.00
BENEFIT	0.93	0.00
PA	0.96	0.00

Note: Table 2 reports the p-values associated with the null hypothesis of no cointegration obtained from the Fisher version of the Dickey Fuller test with trend for panel data, under the assumption of no cross sectional correlation (see Stata command XTDFTEST developed by L.Nunziata – Nuffield College Oxford)

Table 3 – Sample correlation of the relevant variables – levels
available sample dimensions in italics

	DEN	UNE	EMPL	INFL	SPART	CENTR	BENEFIT	WORK	PA	LEFTV
DEN	1.0000									
	649									
UNE	-0.1632*	1.0000								
	643	*673*								
EMPL	0.2891*	-0.6071*	1.0000							
	648	*668*	*673*							
INFL	0.1642*	0.0439	-0.1340*	1.0000						
	622	*643*	*643*	*644*						
SPART	-0.0830*	-0.0350	-0.0017	0.1670*	1.0000					
	649	*673*	*673*	*644*	*756*					
CENTR	0.5182*	-0.2955*	0.0683	0.0237	0.0237	1.0000				
	647	*649*	*654*	*628*	*656*	*656*				
BENEFIT	0.1125*	0.3397*	-0.0455	-0.0654	0.0494	-0.0165	1.0000			
	616	*631*	*636*	*620*	*636*	*621*	*636*			
WORK	0.7220*	-0.0456	0.2551*	-0.0045	0.0499	0.4882*	0.2129*	1.0000		
	649	*647*	*652*	*624*	*655*	*652*	*617*	*655*		
PA	0.4747*	0.1181*	0.2334*	0.0380	0.0523	0.0476	0.4447*	0.4574*	1.0000	
	649	*673*	*673*	*644*	*756*	*656*	*636*	*655*	*756*	
LEFTV	0.1964*	-0.2471*	0.3671*	-0.0027	-0.0145	0.3575*	-0.0252	0.5778*	0.2153*	1.0000
	598	*593*	*598*	*581*	*598*	*598*	*588*	*598*	*598*	*598*

Table 4 – Sample correlation of the relevant variables – first differences
available sample dimensions in italics

	ΔDEN	ΔUNE	ΔEMPL	ΔINFL	ΔSPART	CENTR	ΔBENEF	WORK	ΔPA	ΔLEFTV
ΔDEN	1.0000									
	635									
ΔUNE	0.1732*	1.0000								
	629	*659*								
ΔEMPL	-0.2272*	-0.7236*	1.0000							
	634	*654*	*659*							
ΔINFL	0.0190	-0.1721*	0.1601*	1.0000						
	608	*629*	*629*	*630*						
ΔSPART	0.0533	-0.0464	0.0257	0.0350	1.0000					
	592	*596*	*601*	*585*	*601*					
CENTR	0.1420*	-0.0647	0.0269	-0.0286	-0.0134	1.0000				
	633	*636*	*641*	*615*	*597*	*656*				
ΔBENEF	0.1036*	0.0314	-0.0184	-0.0015	0.0134	-0.0610	-1.0000			
	602	*617*	*622*	*606*	*591*	*608*	*622*			
WORK	0.2286*	0.0352	-0.0104	0.0131	-0.0051	0.4882*	0.0453	1.0000		
	635	*634*	*639*	*611*	*593*	*652*	*604*	*655*		
ΔPA	0.2504*	0.3482*	-0.3324*	-0.0446	-0.0066	0.0228	0.1069*	0.1979*	1.0000	
	603	*614*	*614*	*597*	*578*	*609*	*585*	*607*	*615*	
ΔLEFTV	-0.1143*	-0.0669	0.0480	-0.0193	0.0312	0.0013	-0.0094	-0.0262	-0.0200	1.0000
	585	*580*	*585*	*568*	*578*	*585*	*575*	*585*	*559*	*585*

Legend: see Table 1

Table 5 - Determinants of union density (fixed effects)

(t-statistics in parentheses - ** indicates statistical significance at 99%; * indicates statistical significance at 95%)

# obs :	585	585	585	585	570	558
Depvar:	Δden	Δden	Δden	Δden	Δden	Δden
Δune_{-1}	-0.270**	-0.224**		-0.273**	-0.257**	-0.270**
	(-4.50)	(-3.35)		(-4.55)	(-3.93)	(-4.12)
Δinfl	-0.042*	-0.050*		-0.044*	-0.042*	-0.044*
	(-2.03)	(-2.15)		(-2.11)	(-2.00)	(-2.08)
st.dev. une_{-1}			-0.179*			
			(-2.11)			
st.dev. infl			0.017			
			(0.60)			
Δopen				0.011	0.010	
				(0.89)	(0.83)	
kcontr					-0.005	
					(-0.87)	
Ghent*Δune_{-1}	0.342**	0.304**	0.160*	0.339**	0.330**	0.359**
	(4.14)	(3.64)	(2.29)	(4.09)	(3.83)	(4.12)
indx*Δinfl	0.090**	0.077**	0.057**	0.089**	0.089**	0.089**
	(3.11)	(2.61)	(2.74)	(3.08)	(3.01)	(3.04)
Ghent*Δbenef	0.071*	0.041	0.064	0.070*	0.072*	0.074*
	(2.20)	(1.26)	(1.94)	(2.17)	(2.20)	(2.26)
Δspar	0.001	0.001	0.001	0.001	0.001	0.001*
	(1.95)	(1.82)	(1.87)	(1.88)	(1.84)	(2.02)
Δleftv						-0.063*
						(-2.53)
centr	0.016**	0.011*	0.018**	0.016**	0.017**	0.017**
	(3.77)	(2.45)	(4.18)	(3.70)	(3.81)	(3.92)
Δempl	-0.323**	-0.343**	-0.293**	-0.323**	-0.327**	-0.312**
	(-4.99)	(-4.89)	(-4.54)	(-4.98)	(-4.93)	(-4.71)
workplace	0.017**	0.017**	0.013**	0.017**	0.016**	0.017**
	(4.23)	(4.23)	(3.12)	(4.26)	(3.76)	(4.08)
Δpa_{-1}	0.137*	0.110	0.081	0.136*	0.122	0.118
	(2.13)	(1.66)	(1.27)	(2.11)	(1.86)	(1.81)
error correction component						
den_{-1}	-0.023**	-0.026**	-0.024**	-0.023**	-0.022**	-0.024**
	(-3.35)	(-3.58)	(-3.31)	(-3.34)	(-2.95)	(-3.39)
une_{-2}	-0.144**	-0.095**	-0.122**	-0.143**	-0.134**	-0.142**
	(-7.75)	(-4.07)	(-6.36)	(-7.71)	(-6.28)	(-7.44)
Ghent*une_{-2}	0.124**	0.114**	0.124**	0.122**	0.118**	0.132**
	(3.67)	(3.40)	(3.58)	(3.60)	(3.43)	(3.66)
$indx_{-1}$*$infl_{-1}$	0.025*	-0.001	0.024	0.025*	0.023*	0.025*
	(2.15)	(-0.05)	(1.91)	(2.12)	(1.96)	(2.12)
$benefit_{-1}$	0.012*	0.015*	0.013*	0.012*	0.015**	0.012*
	(2.56)	(2.56)	(2.57)	(2.53)	(2.63)	(2.47)
Constant	Yes	Yes	Yes	Yes	Yes	Yes
Definition	Yes	Yes	Yes	Yes	Yes	Yes
Countries	Yes	Yes	Yes	Yes	Yes	Yes
Year	--	Yes	--	--	--	--
R^2(within)	0.38	0.46	0.36	0.38	0.37	0.38
Dw	1.31	1.32	1.33	1.32	1.32	1.35
LM	59.9	59.2	56.4	58.9	57.4	51.8

Notes: GHENT is a dummy taking value = 1 for Finland, Belgium , Sweden and Denmark. INDX indicates the presence of indexation clauses (see Appendix). WORKPLACE indicates the presence of workplace representation (see Appendix). LM report a test for serial correlation, assuming alternative specification for the error autocorrelation structure (either AR(1) or MA(1)). The last two columns exclude Spain because of lack of data on capital controls and on voting. Dummies controlling for change in definitions: DEF1 controls for introduction of UIL membership in Italy in 1968; DEF2 controls for the change in the labour force definition in Sweden in 1963; DEF3 controls for German reunification and new aggregation in 1991; DEF4 controls for CC.OO membership in Spain in 1991.

Table 6 – Structural stability - determinants of union density (fixed effects)
(t-statistics in parentheses - ** indicates statistical significance at 99%; * indicates statistical significance at 95%)

sample:	1950-98	1950-75	1975-98	1950-85
# obs :	585	298	300	432
Depvar:	Δden	Δden	Δden	Δden
Δune_{-1}	-0.270**	-0.363**	-0.236**	-0.258**
	(-4.50)	(-3.14)	(-3.32)	(-3.22)
Δinfl	-0.042*	-0.075**	0.004	-0.048*
	(-2.03)	(-2.94)	(0.11)	(-2.06)
Ghent*Δune_{-1}	0.342**	0.651**	0.225*	0.398**
	(4.14)	(4.07)	(2.50)	(3.45)
indx*Δinfl	0.090**	0.129**	-0.003	0.094**
	(3.11)	(3.61)	(-0.06)	(2.90)
Ghent*Δbenef	0.071*	0.099*	0.016	0.081*
	(2.20)	(2.26)	(0.38)	(1.98)
Δspart	0.001	0.001	0.001*	0.000
	(1.95)	(1.29)	(1.97)	(1.27)
centr	0.016**	0.024*	0.017**	0.020**
	(3.77)	(2.67)	(3.19)	(3.39)
Δempl	-0.323**	-0.328**	-0.451**	-0.243*
	(-4.99)	(-2.70)	(-6.39)	(-2.51)
workplace	0.017**	0.048**	0.006	0.020**
	(4.23)	(6.06)	(0.51)	(3.80)
Δpa_{-1}	0.137*	0.049	0.289**	0.077
	(2.13)	(0.58)	(2.93)	(0.95)
error correction component				
den_{-1}	-0.023**	-0.023	-0.047**	-0.029**
	(-4.35)	(-1.22)	(-3.28)	(-2.86)
une_{-2}	-0.144**	-0.100*	-0.115**	-0.141**
	(-7.75)	(-2.03)	(-3.49)	(-5.10)
Ghent*une_{-2}	0.124**	0.200*	0.083	0.135*
	(3.67)	(2.40)	(1.85)	(2.58)
$indx_{-1}$*$infl_{-1}$	0.025*	-0.001	0.056**	0.018
	(2.15)	(-0.00)	(3.72)	(1.39)
$benefit_{-1}$	0.012*	0.019	0.015	0.018*
	(2.52)	(1.55)	(1.40)	(2.45)
Constant	Yes	Yes	Yes	Yes
Definition	Yes	Yes	Yes	Yes
Countries	Yes	Yes	Yes	Yes
R^2(within)	0.380	0.437	0.467	0.335

Notes: see Tables 1-5.

Table 7 – Long run determinants of union density (least square fixed effects)

(t-statistics in parentheses - ** indicates statistical significance at 99%; * indicates statistical significance at 95%)

# obs :	599	599	599	599	599	599
Depvar:	den	den	den	den	den	den
une_{-1}	0.367**	0.337**	-0.365**	-0.308**	-0.408**	-0.496**
	(3.63)	(3.10)	(-3.30)	(-2.86)	(-3.76)	(-4.95)
infl	0.692**					
	(9.63)					
index	-0.066**					
	(-7.85)					
indx*infl		0.140	0.223**	0.179**	0.187**	0.153**
		(1.80)	(3.23)	(2.66)	(2.75)	(2.45)
benefit	0.114 **	0.180**	0.150**	0.134**	0.191**	0.022
	(4.00)	(5.87)	(5.53)	(5.08)	(6.92)	(0.81)
Ghent*une_{-1}			2.295**	2.292**	2.442**	1.709**
			(12.74)	(13.12)	(13.71)	(10.08)
spart				0.014**		
				(6.11)		
centr					0.136**	
					(5.35)	
pa_{-1}						0.827**
						(11.74)
Constant	Yes	Yes	Yes	Yes	Yes	Yes
Definition	Yes	Yes	Yes	Yes	Yes	Yes
Countries	Yes	Yes	Yes	Yes	Yes	Yes
R^2(within)	0.26	0.11	0.31	0.35	0.34	0.44
DF pvalue	0.00	0.48	0.13	0.00	0.12	0.73

Note: The Table reports the p-values associated with the null hypothesis of no cointegration in the residuals of the estimated model. The p-values are obtained from the Fisher version of the Dickey Fuller test with trended panel data, under the assumption of no cross-sectional correlation (see Stata command XTDFTEST, developed by L. Nunziata, Nuffield College Oxford)

Table 8 – Robustness tests – determinants of union density – country exclusions

(t-statistics in parentheses - ** indicates statistical significance at 99%; * indicates statistical significance at 95%)

Model 1: excluding Finland
Model 2: excluding Belgium
Model 3: excluding Sweden
Model 4: excluding Denmark
Model 5: excluding Norway
Model 6: excluding Italy
Model 7: excluding Great Britain
Model 8: excluding Ireland
Model 9: excluding West Germany
Model 10: excluding Netherlands
Model 11: excluding Austria
Model 12: excluding France
Model 13: excluding Switzerland
Model 14: excluding Spain

Model :	1	2	3	4	5	6	7	8	9	10	11	12	13	14
# obs :	524	522	522	522	522	522	522	527	522	522	524	533	522	552
Depvar:	Δden	Δden	Δden	Δden	Δden	Δden	Δden	Δden	Δden	Δden	Δden	Δden	Δden	Δden
Δune_{-1}	-0.324**	-0.297**	-0.315**	-0.284**	-0.303**	-0.250**	-0.347**	-0.301**	-0.288**	-0.289**	-0.307**	-0.293**	-0.284**	-0.292**
	(-6.04)	(-4.83)	(-5.06)	(-4.77)	(-4.74)	(-4.05)	(-5.16)	(-4.61)	(-4.40)	(-4.31)	(-4.86)	(-4.69)	(-4.51)	(-4.47)
Δinfl	-0.049**	-0.047*	-0.045*	-0.048*	-0.047*	-0.051*	-0.058**	-0.049*	-0.040	-0.044	-0.034	-0.049*	-0.050*	-0.048*
	(-2.61)	(-2.26)	(-2.05)	(-2.35)	(-2.22)	(-2.57)	(-2.62)	(-2.34)	(-1.85)	(-1.96)	(-1.31)	(-2.29)	(-2.37)	(-2.28)
$Ghent*\Delta une_{-1}$	0.540**	0.315**	0.303**	0.218*	0.343**	0.270**	0.382**	0.350**	0.329**	0.326**	0.347**	0.327**	0.346**	0.334**
	(6.17)	(3.52)	(3.49)	(2.40)	(3.93)	(3.32)	(4.28)	(4.00)	(3.75)	(3.64)	(4.03)	(3.81)	(4.01)	(3.84)
indx*Δinfl	0.065*	0.068*	0.065*	0.086**	0.065*	0.054	0.072*	0.085**	0.063*	0.071*	0.057	0.073*	0.079*	0.070*
	(2.40)	(2.27)	(2.11)	(2.90)	(2.07)	(1.80)	(2.29)	(2.79)	(2.08)	(2.28)	(1.69)	(2.42)	(2.57)	(2.36)
Ghent*Δbenef	0.069*	0.056	0.067	0.091*	0.068*	0.072*	0.069*	0.067*	0.071*	0.069*	0.070*	0.069*	0.068*	0.069*
	(2.05)	(1.61)	(1.83)	(2.25)	(2.07)	(2.39)	(2.11)	(2.08)	(2.16)	(2.09)	(2.12)	(2.10)	(2.07)	(2.12)
Δspart	0.000	0.001	0.001*	0.001*	0.000	0.001*	0.001	0.001	0.001*	0.001	0.001*	0.001*	0.000	0.001
	(1.41)	(1.88)	(1.99)	(2.14)	(1.58)	(2.22)	(1.87)	(1.80)	(2.03)	(1.63)	(2.13)	(2.01)	(1.64)	(1.91)
centr	0.012**	0.020**	0.021**	0.018**	0.020**	0.021**	0.016**	0.023**	0.020**	0.018**	0.019**	0.018**	0.019**	0.019**
	(2.77)	(4.15)	(4.54)	(4.16)	(4.41)	(4.91)	(3.36)	(4.58)	(4.46)	(3.84)	(4.14)	(4.08)	(4.23)	(4.28)
Δempl	-0.430**	-0.337**	-0.321**	-0.341**	-0.346**	-0.316**	-0.346**	-0.331**	-0.380**	-0.348**	-0.355**	-0.345**	-0.273**	-0.341**
	(-6.94)	(-5.00)	(-4.69)	(-4.96)	(-4.93)	(-4.98)	(-5.07)	(-4.96)	(-5.55)	(-4.97)	(-5.16)	(-5.12)	(-3.70)	(-5.13)
workplace	0.017**	0.017**	0.017**	0.018**	0.017**	0.009	0.021**	0.016**	0.016**	0.017**	0.017**	0.018**	0.016**	0.017**
	(4.74)	(4.19)	(4.12)	(4.52)	(3.98)	(1.64)	(4.41)	(3.91)	(3.77)	(3.79)	(4.05)	(4.19)	(3.96)	(4.08)
Δpa_{-1}	0.098	0.155*	0.274**	0.124	0.131	0.117	0.129	0.127	0.098	0.126	0.138*	0.140*	0.121	0.127
	(1.68)	(2.33)	(3.26)	(1.88)	(1.95)	(1.93)	(1.89)	(1.94)	(1.42)	(1.88)	(2.04)	(2.13)	(1.82)	(1.96)
den_{-1}	-0.022**	-0.032**	-0.032**	-0.029**	-0.029**	-0.021**	-0.033**	-0.028**	-0.032**	-0.029**	-0.032**	-0.029**	-0.030**	-0.029**
	(-2.86)	(-4.19)	(-4.22)	(-3.98)	(-3.88)	(-3.02)	(-4.23)	(-3.83)	(-4.24)	(-3.48)	(-4.14)	(-3.87)	(-3.95)	(-4.00)
une_{-2}	-0.133**	-0.144**	-0.141**	-0.139**	-0.142**	-0.125**	-0.162**	-0.132**	-0.161**	-0.143**	-0.144**	-0.138**	-0.149**	-0.141**
	(-8.05)	(-7.54)	(-7.40)	(-7.43)	(-7.30)	(-6.78)	(-7.58)	(-6.20)	(-7.64)	(-6.72)	(-7.37)	(-6.96)	(-7.68)	(-7.39)
$Ghent*une_{-2}$	0.094**	0.146**	0.129**	0.128**	0.126**	0.103**	0.137**	0.118**	0.145**	0.122**	0.130**	0.119**	0.127**	0.122**
	(2.71)	(3.35)	(3.55)	(3.40)	(3.49)	(3.02)	(3.67)	(3.22)	(3.91)	(3.32)	(3.57)	(3.31)	(3.50)	(3.44)
$indx_{-1}*infl_{-1}$	0.040**	0.023	0.023	0.019	0.029*	0.040**	0.022	0.036**	0.028*	0.032*	0.029*	0.029*	0.028*	0.029*
	(3.62)	(1.91)	(1.82)	(1.56)	(2.28)	(3.25)	(1.65)	(2.75)	(2.34)	(2.51)	(2.42)	(2.44)	(2.28)	(2.48)
$benefit_{-1}$	0.012**	0.013*	0.011*	0.008	0.012*	0.014**	0.013**	0.014**	0.016**	0.014**	0.015**	0.013*	0.015**	0.013**
	(2.78)	(2.45)	(2.04)	(1.50)	(2.15)	(2.85)	(2.66)	(2.85)	(3.14)	(2.59)	(2.70)	(2.48)	(2.80)	(2.64)
Constant	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Definition	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Countries	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2(within)	0.488	0.401	0.367	0.409	0.402	0.365	0.384	0.399	0.394	0.395	0.403	0.398	0.394	0.385
DW	1.25	1.31	1.31	1.28	1.29	1.38	1.31	1.36	1.34	1.32	1.32	1.31	1.32	1.31

Notes: see Tables 1-5.

Table 9 - Robustness tests – determinants of union density - country by country estimates

(t-statistics in parentheses - ** indicates statistical significance at 99%; * indicates statistical significance at 95%)

Model 1: Finland
Model 2: Belgium
Model 3: Sweden
Model 4: Denmark
Model 5: Norway
Model 6: Italy
Model 7: Great Britain
Model 8: Ireland
Model 9: West Germany
Model 10: Netherlands
Model 11: Austria
Model 12: France
Model 13: Switzerland
Model 14: Spain

Model :	1	2	3	4	5	6	7	8	9	10	11	12	13	14
# obs :	47	44	45	45	45	46	45	41	45	45	45	37	46	15
Depvar:	Δden	Δden	Δden	Δden	Δden	Δden	Δden	Δden	Δden	Δden	Δden	Δden	Δden	Δden
Δune_{-1}			0.423**	0.275		-1.212**	-0.121	-0.327*	-0.254*	-0.311**	0.216	0.222	-0.309	-0.463**
			(4.46)	(1.73)		(-3.21)	(-1.25)	(-2.29)	(-2.22)	(-3.20)	(1.15)	(1.17)	(-1.14)	(-2.98)
Δinfl		-0.295		-0.373	0.194				-0.146**	-0.066*	-0.047		0.040	-0.227**
		(-1.62)		(-1.82)	(1.42)				(-2.79)	(-2.17)	(-1.95)		(0.81)	(-3.16)
indx*Δinfl		0.385		0.377	-0.178	-0.050		-0.077		-0.144*				
		(1.80)		(1.75)	(-1.17)	(-1.09)		(-1.68)		(-2.26)				
Δbenefit		0.145	0.130**	0.041	0.086		-0.275		0.613**	-0.037*	0.043			-0.635**
		(1.90)	(6.33)	(1.06)	(1.92)		(-1.69)		(3.30)	(-2.03)	(1.38)			(-3.74)
Δspart	0.002		0.001	-0.001	0.001*		0.001	0.001		0.001	-0.001		0.001*	
	(1.47)		(1.78)	(-1.30)	(2.48)		(1.20)	(1.08)		(1.14)	(-1.84)		(2.02)	
centr	0.031	0.031**			-0.016		0.042**		0.114*	0.039**	0.022	0.181**	0.226	0.065
	(1.86)	(3.26)			(-1.35)		(3.63)		(2.38)	(2.81)	(1.65)	(5.23)	(1.49)	(1.92)
Δempl		-0.916*	-0.639**	-0.370	-0.739**	0.550	-0.319*	-0.390		-0.292**	-0.401*	-0.416	-0.668**	0.767**
		(-2.22)	(-2.99)	(-1.67)	(-5.09)	(1.38)	(-2.15)	(-1.20)		(-3.34)	(-2.56)	(-1.46)	(-6.11)	(2.73)
workplace						0.045**		-0.093*	0.039**	-0.073**		-0.027		
						(4.98)		(-2.13)	(4.30)	(-2.64)		(-0.97)		
Δpa_{-1}			-0.093**	-0.246		1.158			0.316**	0.325*		-0.288	0.227	1.794*
			(-3.79)	(-0.98)		(1.06)			(6.21)	(2.02)		(-1.44)	(1.26)	(2.56)
den_{-1}	-0.041*		-0.040*	-0.141**	-0.339**	0.042	-0.076**	-0.182		-0.181**	0.079**	-0.250**	0.038	
	(-2.55)		(-2.08)	(-2.82)	(-4.94)	(0.96)	(-3.43)	(-1.75)		(-5.47)	(2.65)	(-2.68)	(0.96)	
une_{-2}				0.132		-0.634**		-0.160	-0.063	-0.091*				-0.450**
				(1.31)		(-5.55)		(-1.85)	(-1.10)	(-2.35)				(-4.67)
$idx_{-1}*infl_{-1}$	-0.260**	0.139**	0.109**	0.182**	0.031	-0.217**	0.071**	0.073*		0.220**			0.088	
	(-5.00)	(4.74)	(4.19)	(2.80)	(1.39)	(-4.39)	(3.55)	(1.97)		(4.05)			(1.39)	
$benefit_{-1}$		0.036		0.065**	0.040**	-0.043	0.254**	0.150	0.165		0.047**	-0.108	0.042	-0.283**
		(1.69)		(3.28)	(4.16)	(-1.45)	(6.67)	(1.21)	(1.44)		(3.76)	(-1.41)	(1.94)	(-4.05)
Constant	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Definition			Yes			Yes			Yes					Yes
R-sq	0.386	0.511	0.833	0.606	0.601	0.762	0.78	0.572	0.816	0.719	0.523	0.596	0.696	0.968
DW	1.66	1.66	1.98	2.19	1.64	1.91	2.26	1.40	1.41	1.77	1.97	2.21	1.27	1.97

NOTES: INDX indicate the presence of indexation clauses (see Appendix). WORKPLACE indicates the presence of workplace representation (see Appendix). DW indicates the Durbin-Watson test for autocorrelation in the errors.
Dummies controlling for change in definitions: DEF1 controls for introduction of UIL membership in Italy in 1968; DEF2 controls for the change in the labour force definition in Sweden in 1963; DEF3 controls for German reunification and new aggregation in 1991; DEF4 controls for introduction of CC.OO membership in Spain in 1991.

FIGURE 1

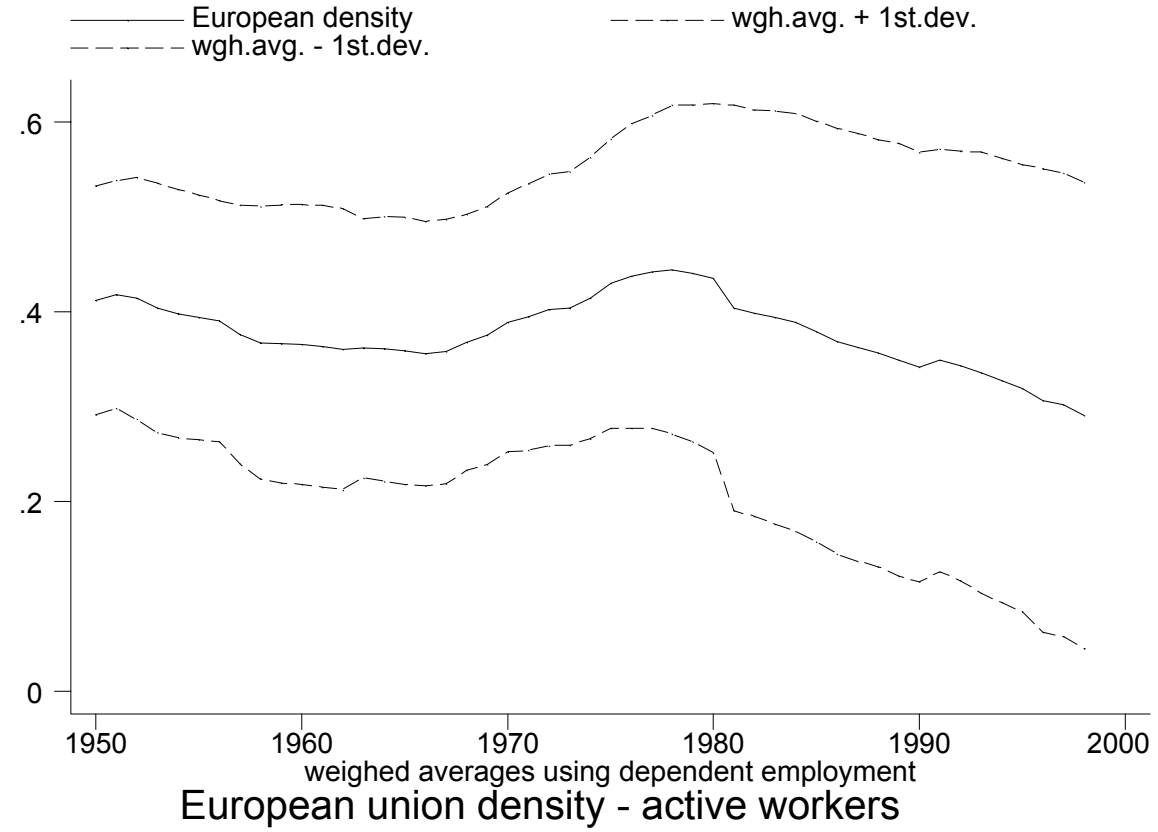


FIGURE 2

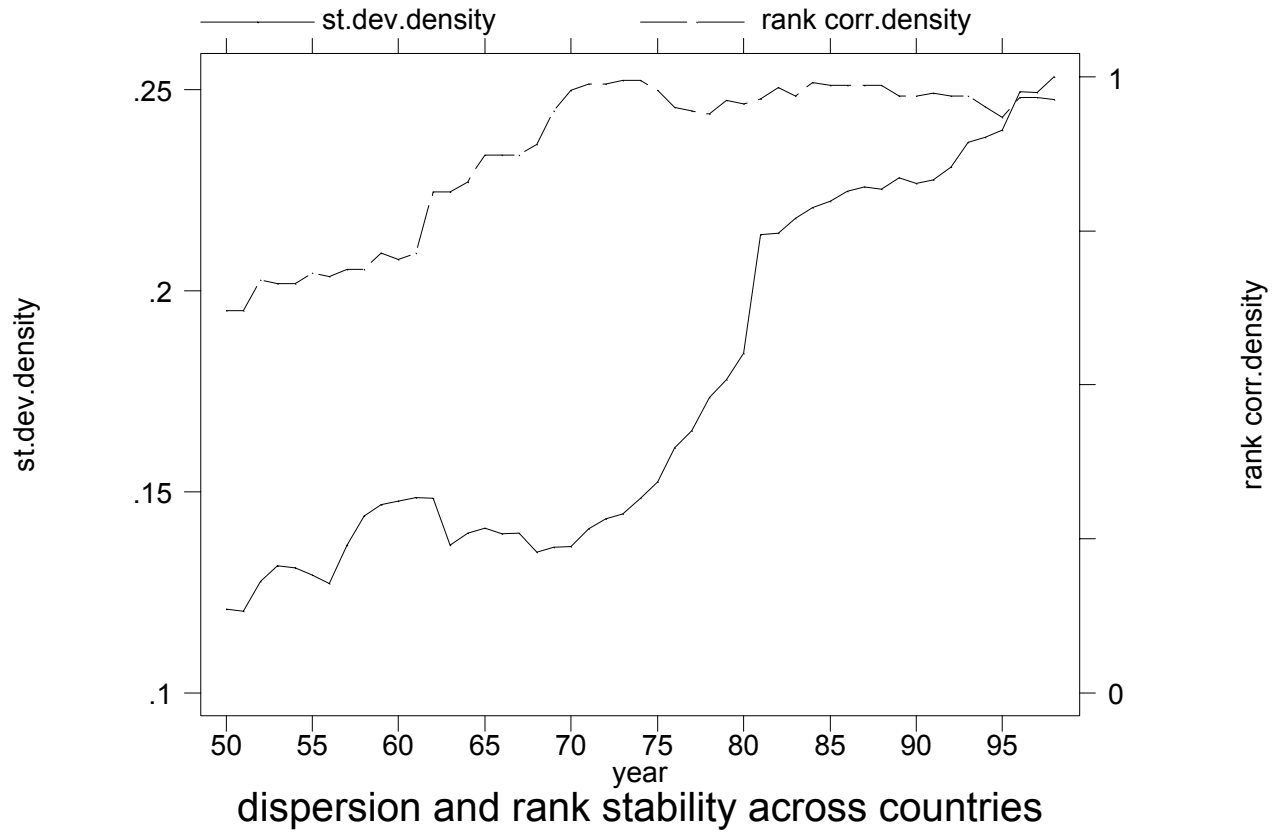
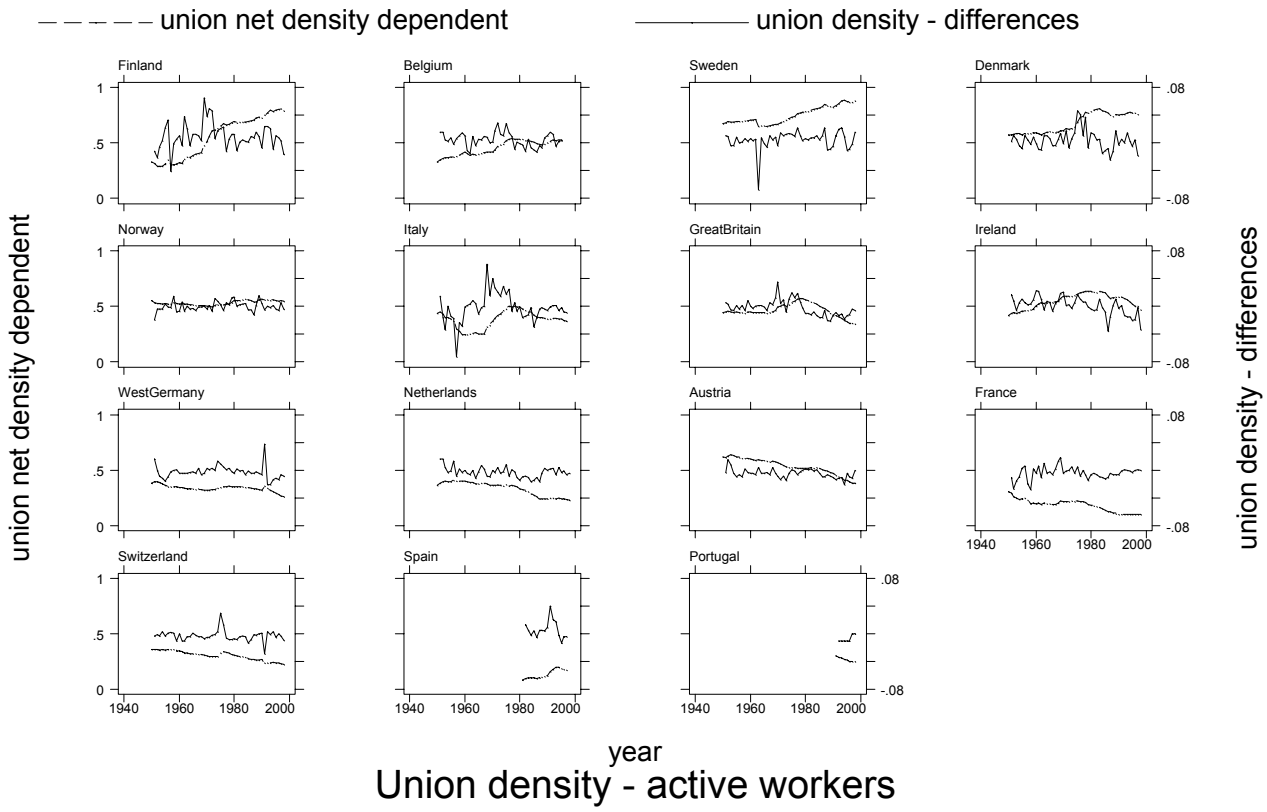
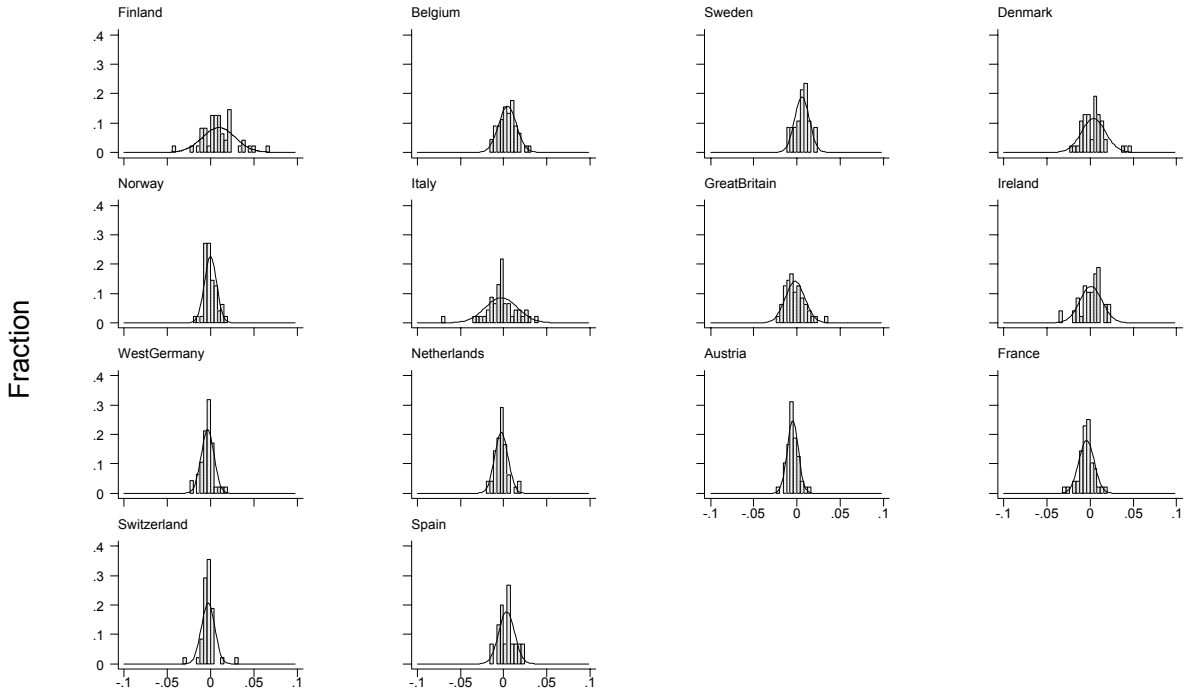


FIGURE 3



Union density - active workers

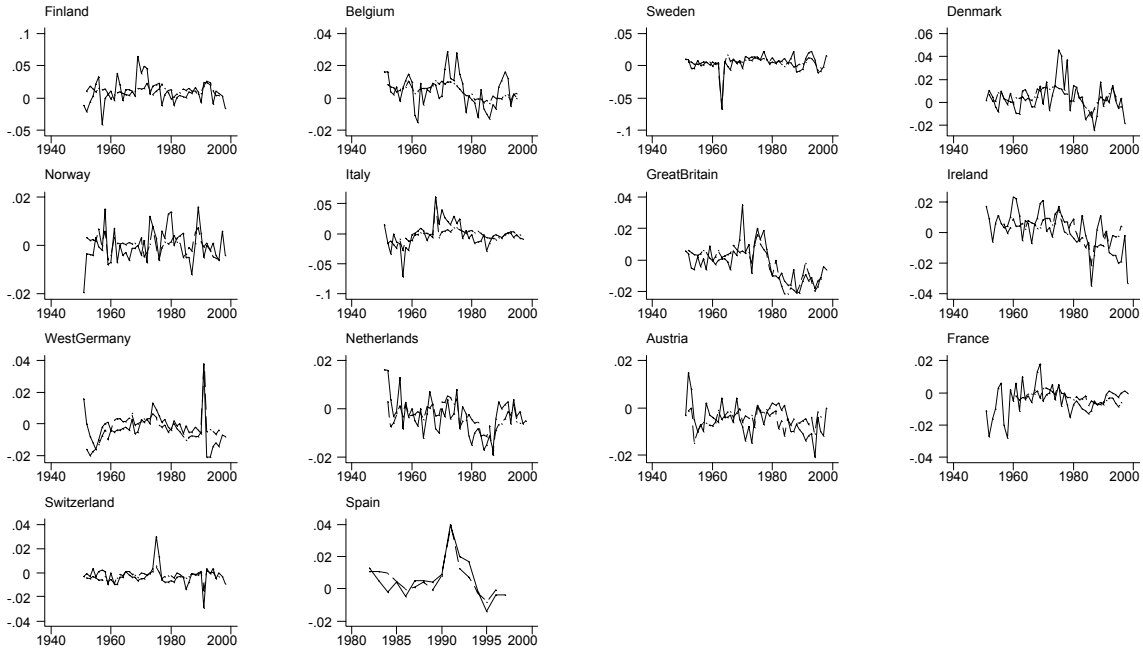
FIGURE 4



Union density - first differences

FIGURE 5

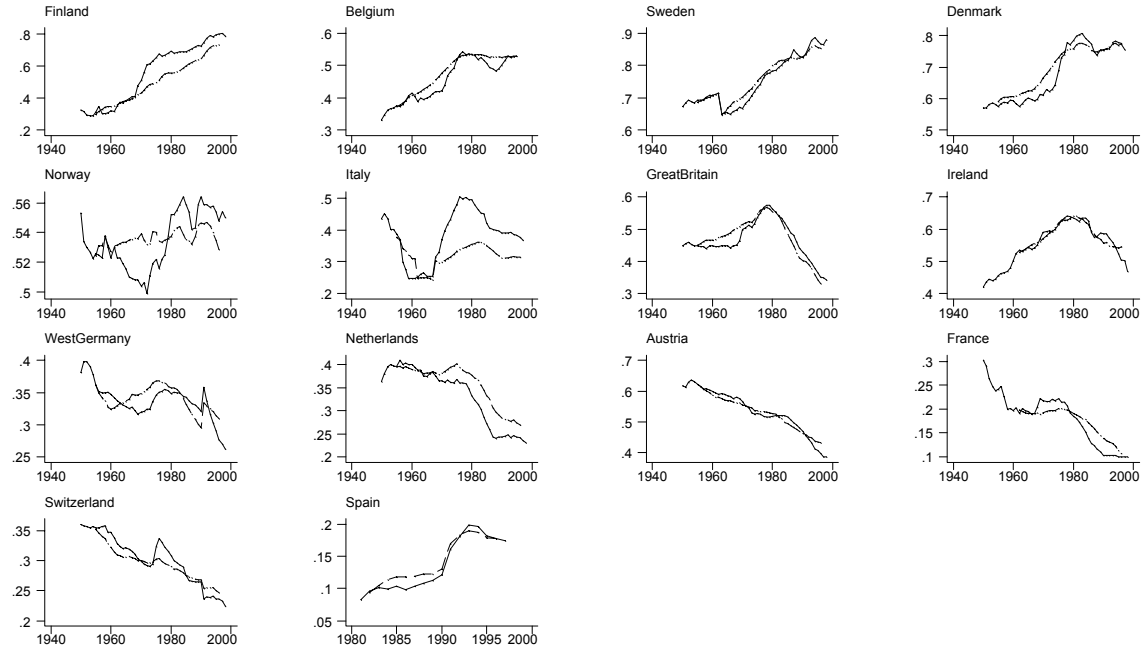
———— union density in differences – – – – – predicted density in difference



static prediction - first differences

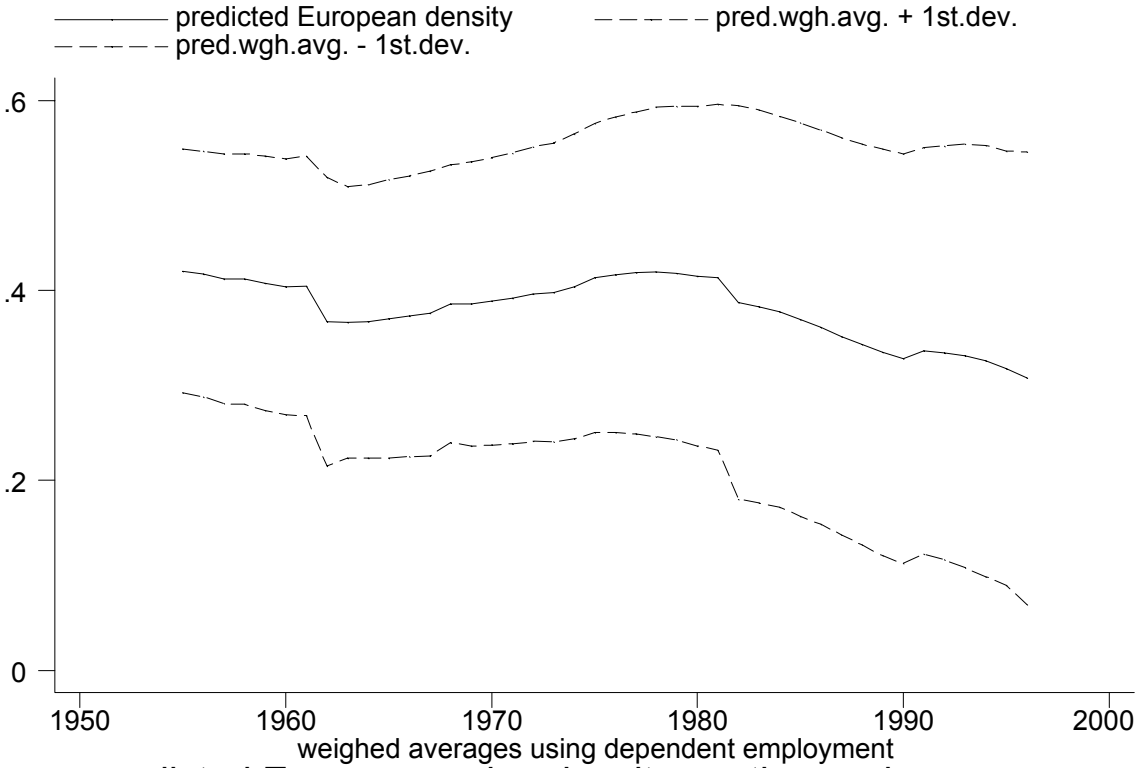
FIGURE 6

———— union net density dependent – – – – – predicted union density



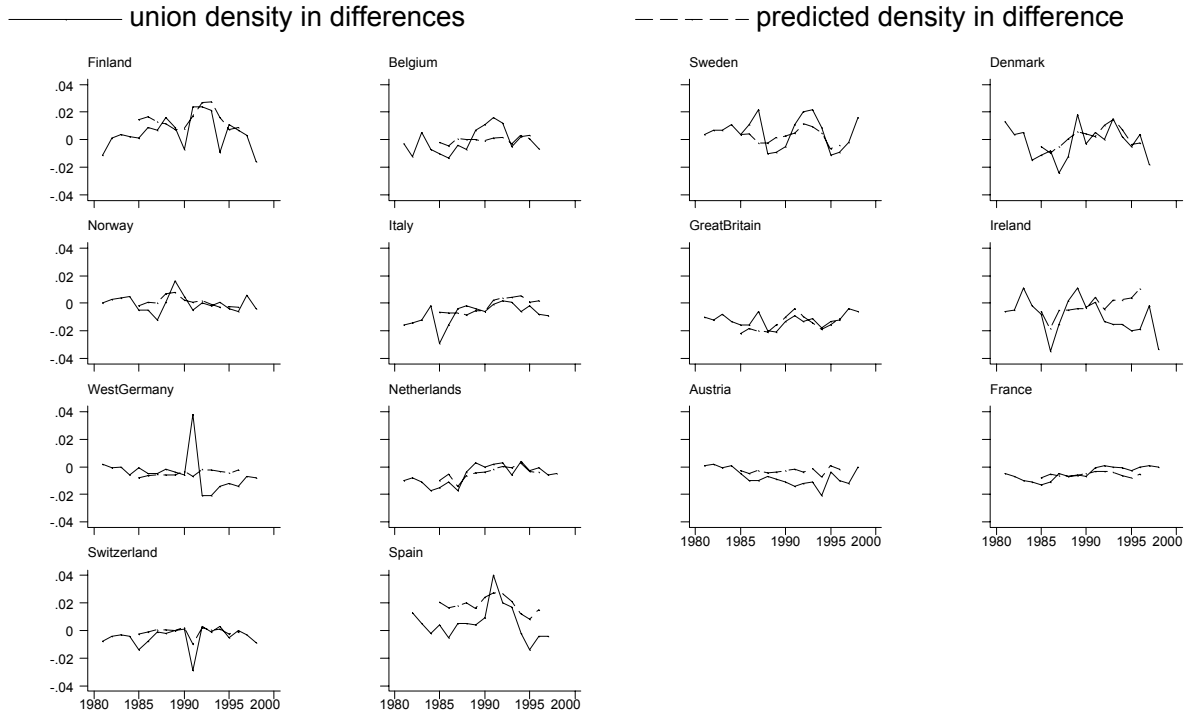
dynamic prediction - levels

FIGURE 7



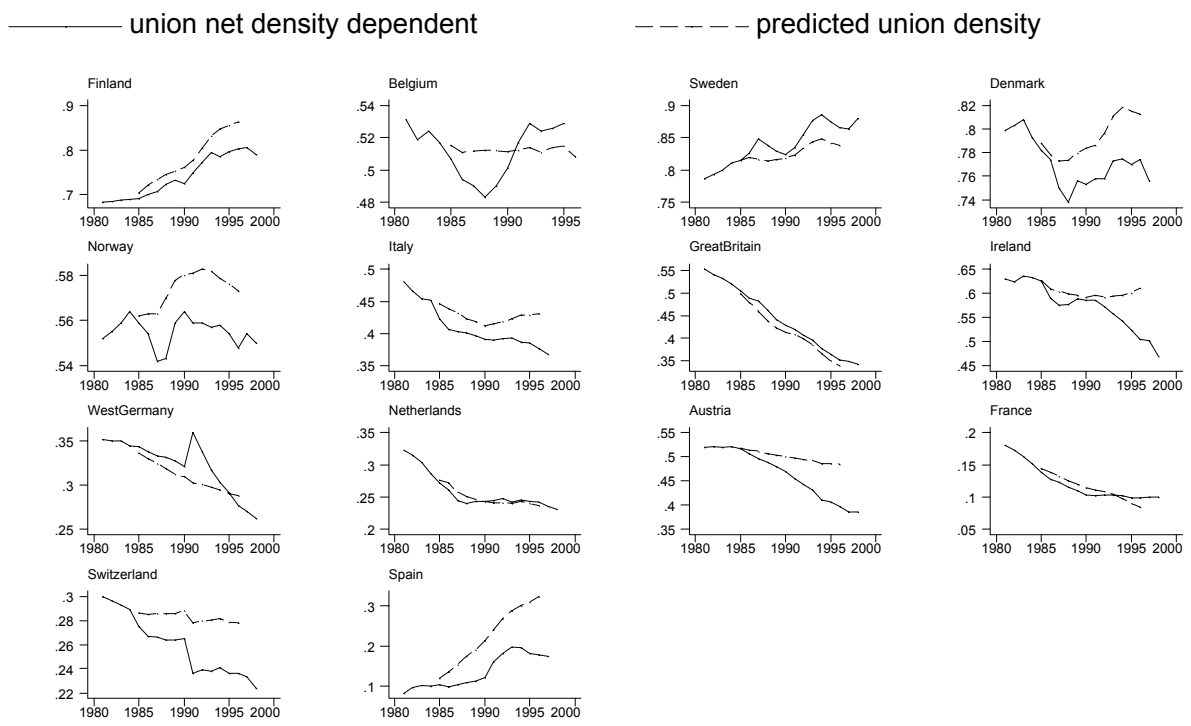
predicted European union density - active workers

FIGURE 8



out of sample predictions beyond 1985 - first differences

FIGURE 9


union net density dependent
predicted union density
Finland
Belgium
Sweden
Denmark
Norway
Italy
GreatBritain
Ireland
WestGermany
Netherlands
Austria
France
Switzerland
Spain
year
out of sample predictions beyond 1985 - levels

Appendix – Data and sources

The variable DEN indicates union net density (gainfully employed members, excluding unemployed or retired). It is derived from Ebbinghaus and Visser (2000), with updates. For Finland (1950-59), Belgium (1950-59), Denmark (1950-74), Norway (1950-55), Netherlands (1950-51), Switzerland (1950-69) net density rates are estimated using the rate of change of gross density rates. For lack of a better alternative, in the case of Great Britain and Ireland, gross instead of net density rates have been used.

The variable UNE indicates unemployment rates (unemployed/labour force); the variable EMPL indicates employment rates (employed/population). Both are computed from labour force statistics extracted from OECD Statistical Compendium 1998/2. For the period 1950-59 data on population, labour force and employment were derived using rates of changes of corresponding variables from Flora *et al.* 1987, who excludes family workers, whereas OECD data includes them.

The variable INFL indicates the rate of change in the consumer price index and has been extracted from OECD Statistical Compendium 1998/2 (1990=100). In the case of Denmark, the CPI index has been extracted from the OECD Main Economic Indicators data-set.

The variable INDX is a step dummy indicating the existence of indexation clauses. We have been unable to find comparable information about the degree of coverage of these clauses. Most of the information is from Braun 1976, updated with information from Ebbinghaus and Visser (2000).

The variable BENEFIT measures the replacement rate (i.e. the ratio between unemployment subsidy and average wages). It includes both unemployment benefits and social assistance benefits, and has been created by taking a weighed average of the earnings of an average production worker wage and two-thirds of it. The source for the period 1960-96 is the OECD data set on Benefit Entitlements and Gross Replacement Rates. For previous years we have extended the series backward by using the rates of change of the number of unemployed covered by public benefits (from Flora *et al.* 1987).

The variable WORK is an index varying between 0 and 1 and indicates the extent of workplace presence of unions. Oskarsson (2001) provides basic information, which we have extended backward relying on the country profiles reported in Ebbinghaus and Visser (2000).

The variable SPART indicates the extent of strike participation, and is given by the ratio of workers involved in strikes (source: ILO Statistics) per 1,000 dependent employees (source: OECD statistics). For initial years we relied on Flora *et al.* 1987.

The variable CENTR combines information about the degree of centralization in wage bargaining and wage coordination across the main workers unions. The way in which this variable is constructed is described in Calmfors et al 2001.

The variable PA indicates the share of governmental employment in total dependent employment. Employment in public services is from the OECD Statistical Compendium for the period 1970-95; the series has been backwarded using the rate of change for central government employment in Flora *et al.* 1987. Where the variable was absent from OECD dataset (Ireland, Switzerland and Spain), we have relied on Scharpf and Schmidt (2000).

The variable LEFT represents Left party votes as a percent of total votes and is obtained from Mackie and Rose 1974 and subsequent extension by Duan Swank. It covers the period 1950-95 (not available for Spain).

Figure A.1 – variable DEN

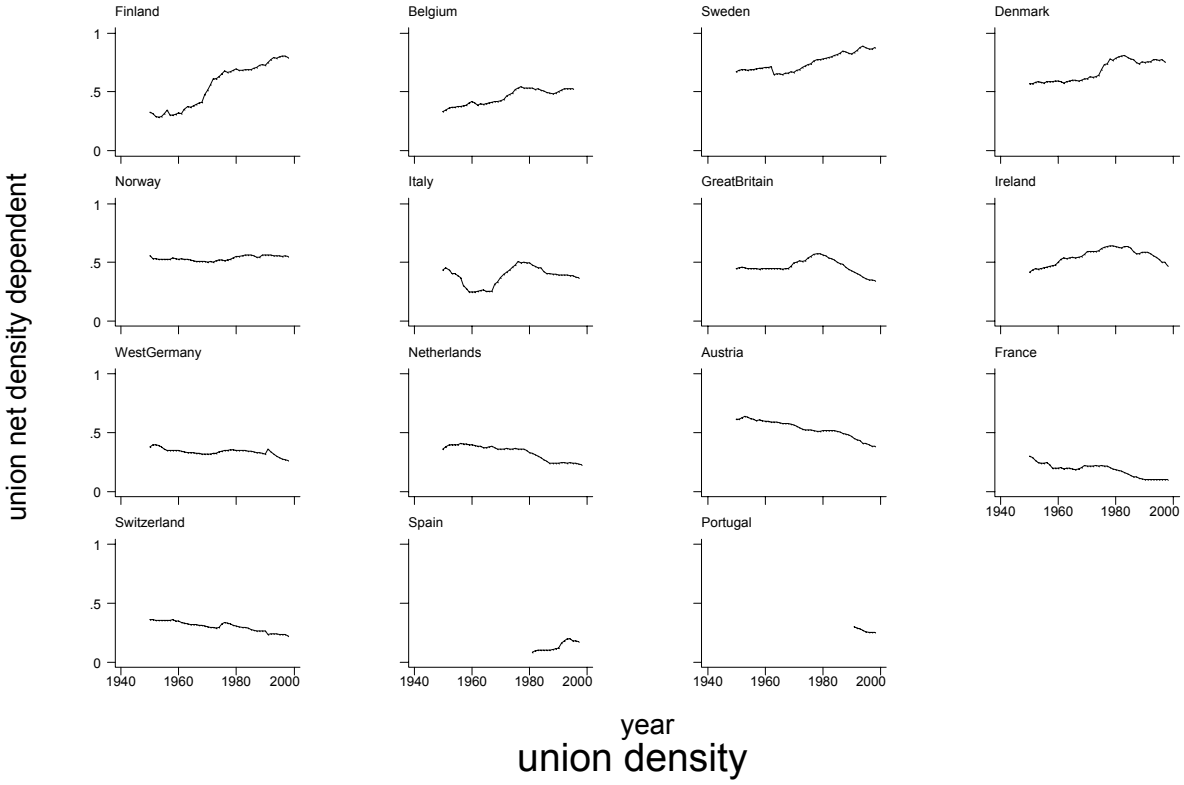


Figure A.2 – variable UNE

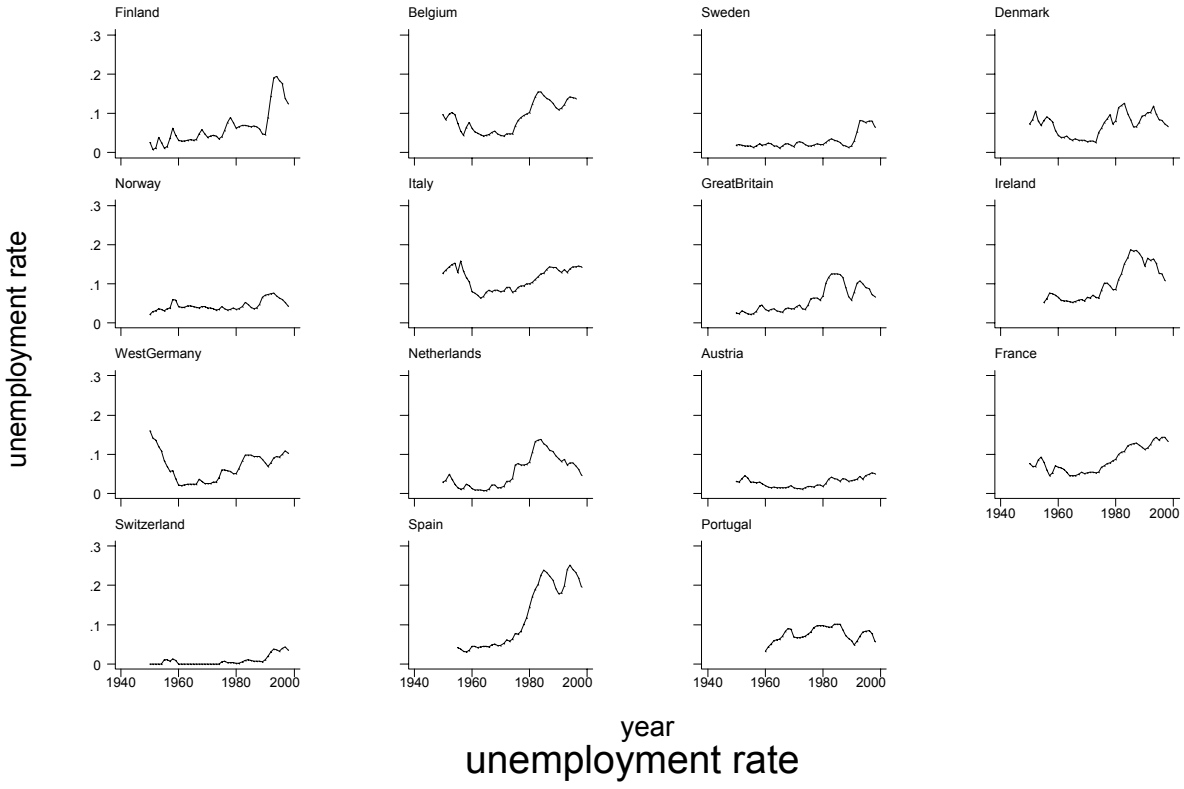


Figure A.3 – variable INFL

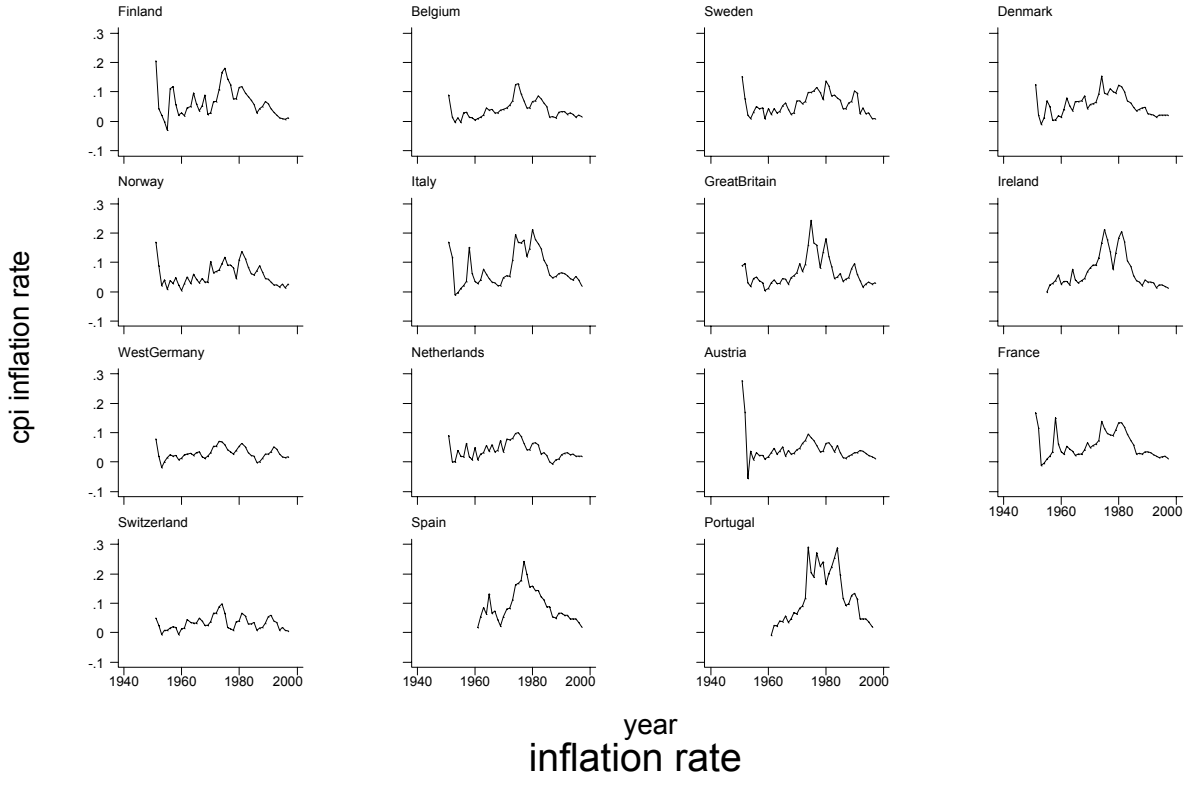


Figure A.4 – variable INDX

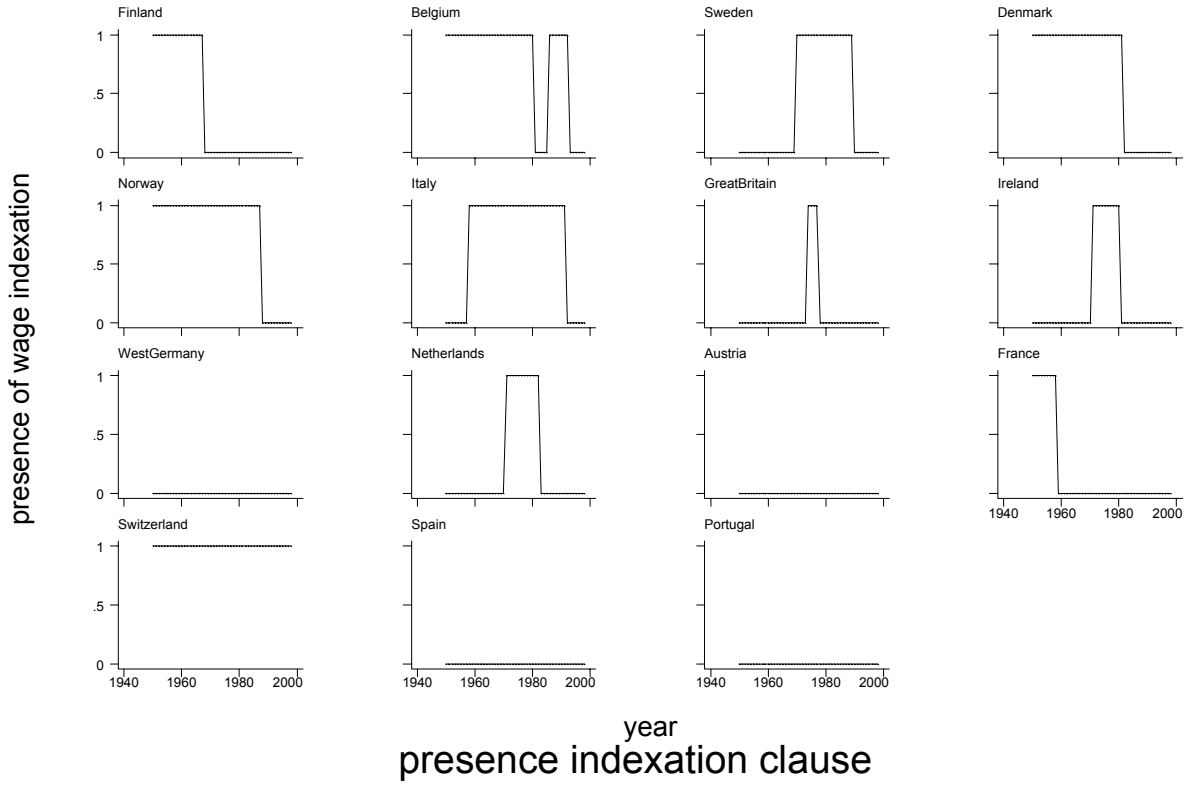


Figure A.5 – variable BENEFIT

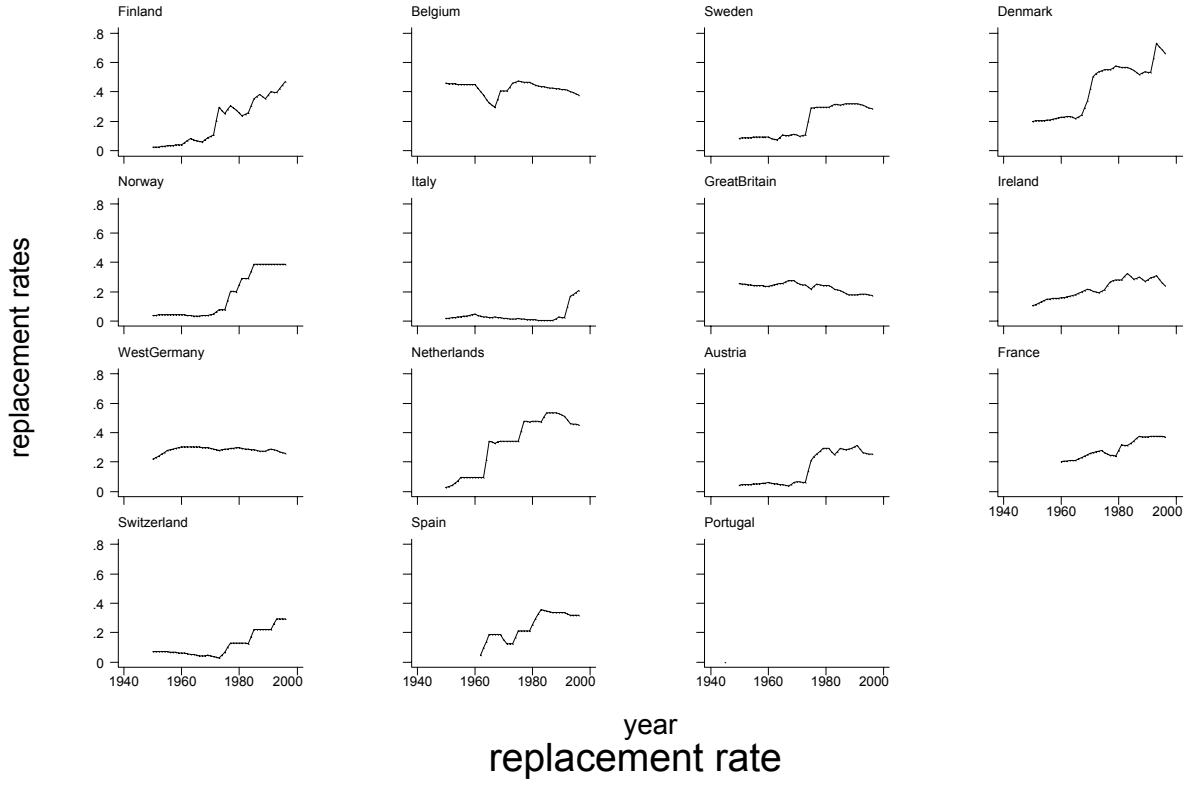


Figure A.6 – variable WORKPLACE

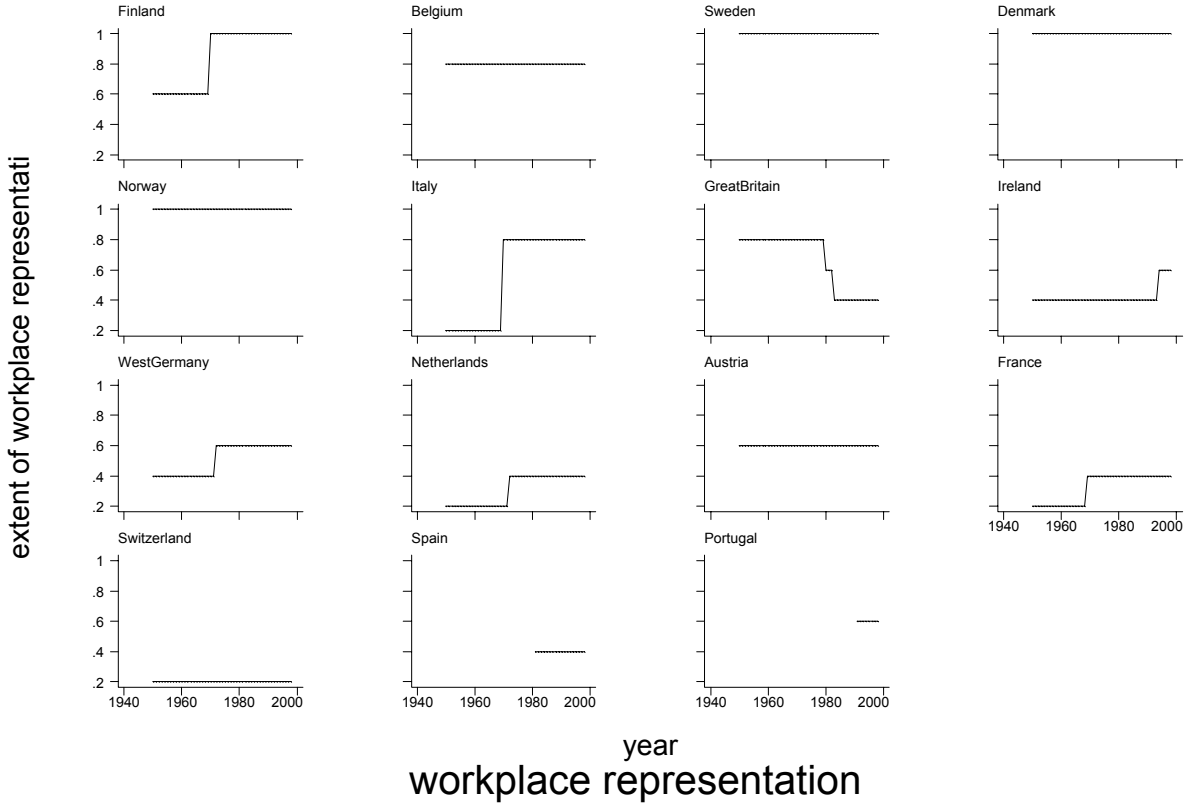


Figure A.7 – variable SPART

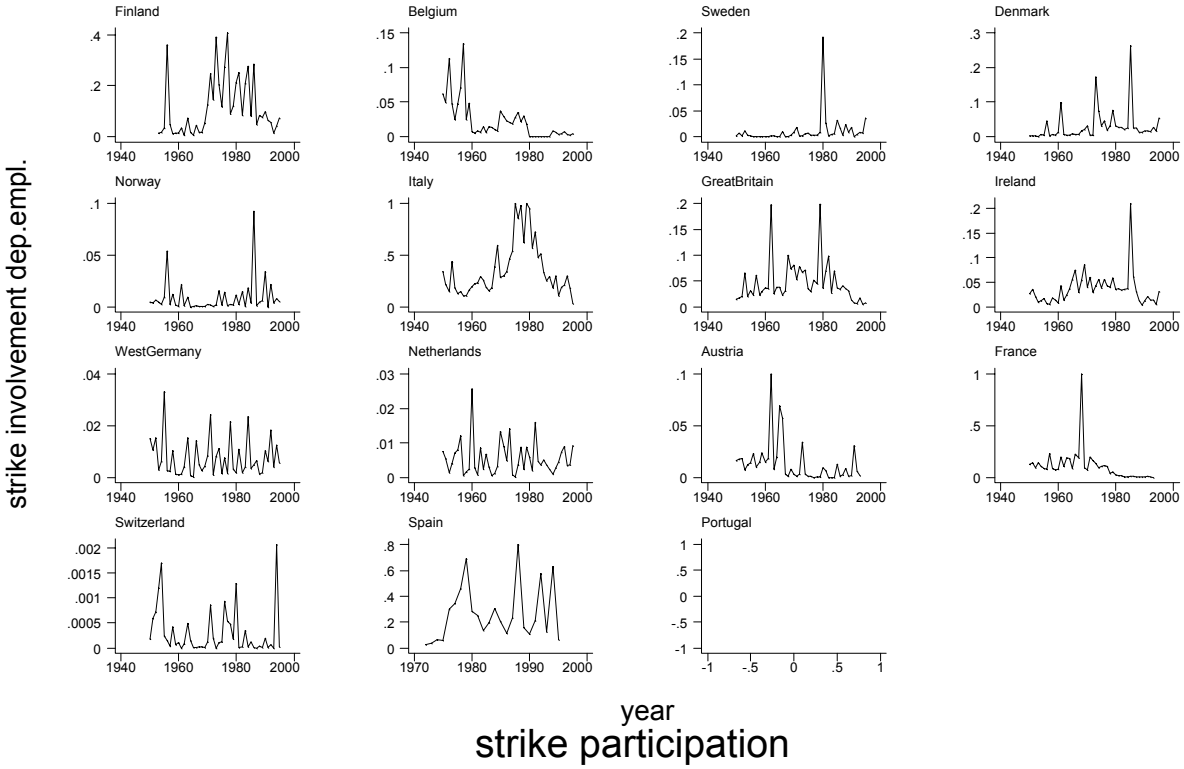


Figure A.8 – variable CENTR

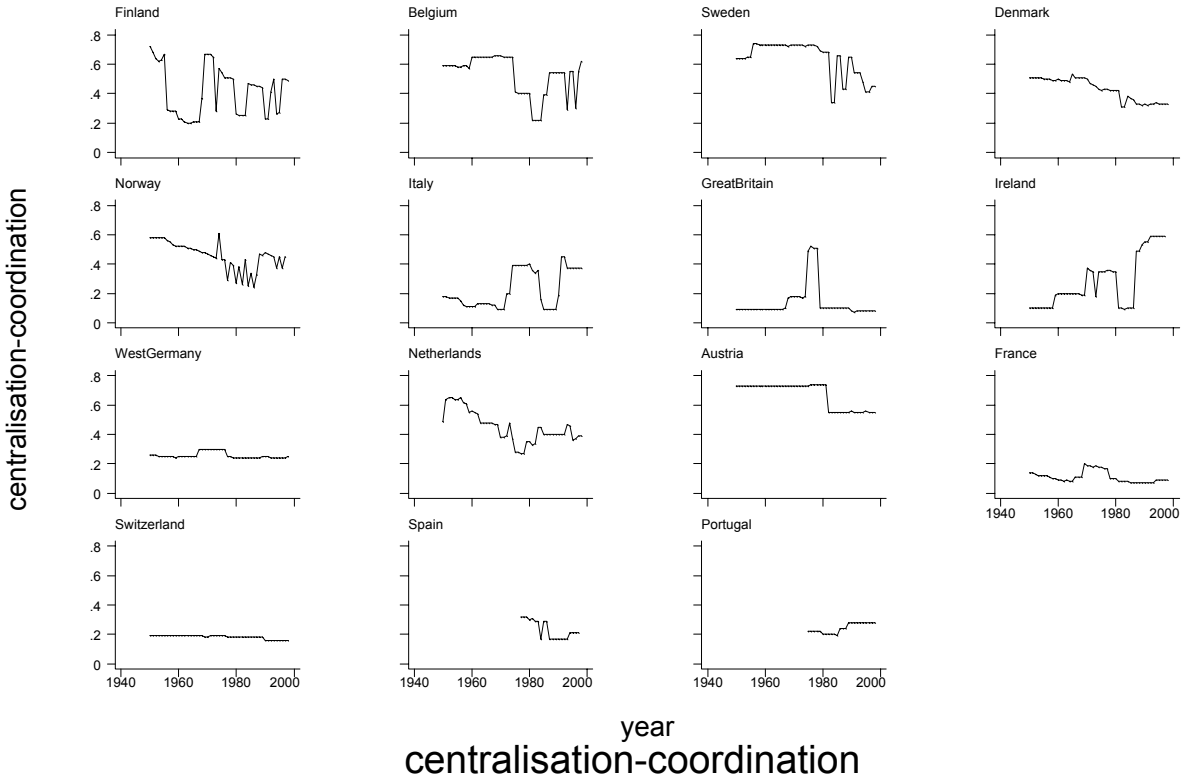


Figure A.9 – variable EMPL

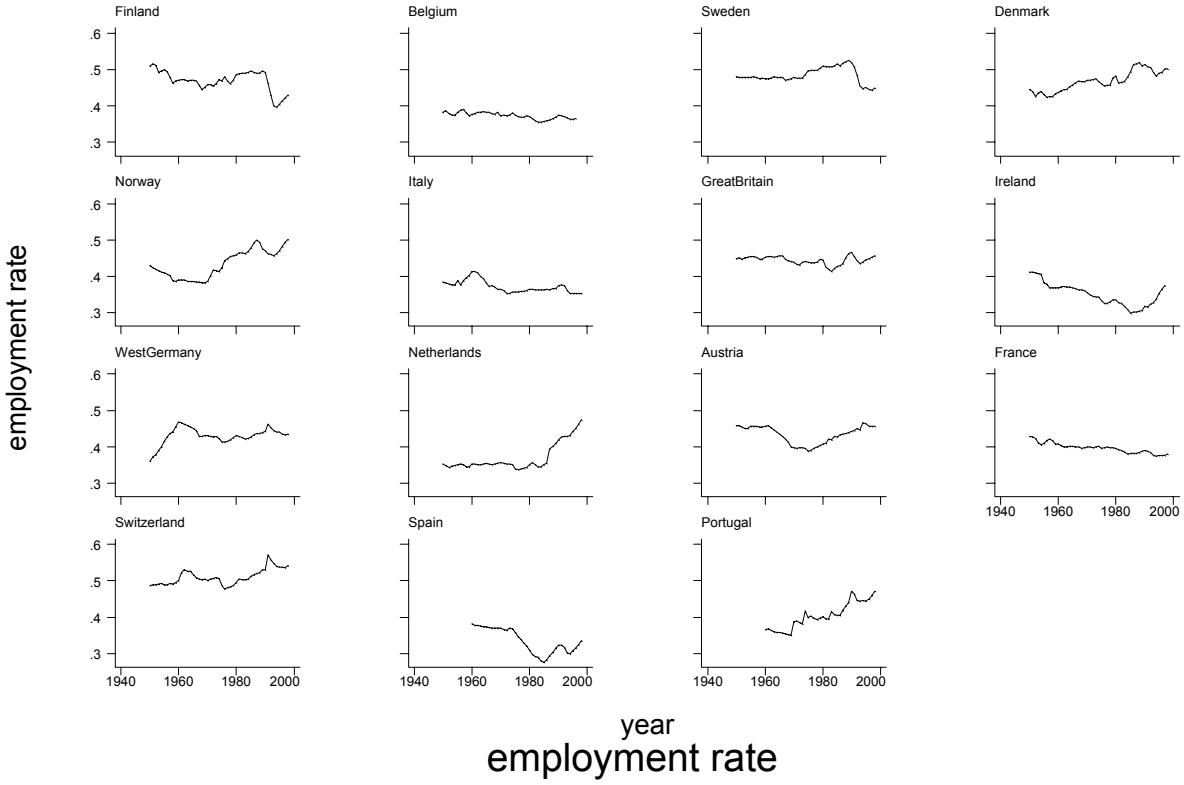


Figure A.10 – variable PA