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PATTERN PERSISTENCE IN EUROPEAN TRADE UNION DENSITY.

A LONGITUDINAL ANALYSIS 1950-1997

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(abstract)

Using annual data on aggregate union membership and density in fourteen European countries, the authors examine the short-term and long-term determinants of the post-war pattern of union growth and decline in Western Europe since 1950. In an attempt to explain the observed convergence in trends and persistence in cross-national differences, most research has applied either business cycle models, using longitudinal data, or concentrated on political, structural or institutional factors, using cross-sectoral samples. Using a pooled (time-series – cross-section) regression, in error-corrected form, the authors build and test an explanatory model that incorporates structural, cyclical and institutional determinants of union decline, and allows a distinction between short-term and long-term effects. The results suggest that the convergent trend to union decline during the 1980s and 1990s is entirely endogenous to labour market changes, the impact of which is mediated by a specific and limited set of labour market institutions.

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 during the 1980s in all but few industrial market economies unionisation rates were falling, sharply contrasting 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 rates of worker involvement in strikes (as measured by strike participation rates), decreasing wage shares, and rising unemployment (Boeri *et al.* 2001). However, not all countries shared in the decline and cross-national variation in unionisation has increased since the 1970s (Blaschke, 2000; Visser 1993; Western, 1997). It is hard to think of another socio-economic variable that exhibits an equally large degree of cross-national variation within the group of industrial market economies.

This combination of trend reversal and divergence, shown in Figure 1, suggests that structural, cyclical and institutional factors may be at work. A common trend, lasting many years, suggests similar structural forces and/or cyclical (economic, political or cultural) influences with roughly similar timing and impacts. Persistent and increasing cross-national differences are *prima facie* evidence that union-organising decisions 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.

Our strategy is to search for a common pattern of union organising behaviour among European countries. Many studies deal with the problem by looking for time invariant patterns or running cross-national regressions on multi-annual averages (Ebbinghaus and Visser 1999; Freeman 1990; 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 the years before 1985 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. 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 (Lange and Scrubbs 1999; Oskarsson 2001; Western 1997).

Before developing our main model, and introducing the data, we begin with presenting our conceptual framework.

2. A conceptual framework

Trade unions are membership organisations. In this sense they differ from firms, as do political parties, most churches and voluntary community organisations. To know which workers join unions, and why, is an important source of knowledge about trade unions. Membership is a critical resource of union bargaining power. A high level of membership in a firm means that fewer workers are available to the firm during an industrial conflict. In the language of game theory, higher membership reduces the firm's conflict payoff and raises the union's bargaining power (Booth 1995). If union membership is high throughout the industry or economy, the firm's 'outside option', its choice to sack all workers and hire replacements in the external labour market, is likewise reduced. In politics, a large and representative union is less easily disregarded.

Why do workers join a trade union? The most obvious answer is that workers want something that they cannot (easily) secure on their own: better wages, terms of employment and working conditions, job security, protection, a feeling of self-respect. According to John Commons (1905, 1918), trade unions are instrumental in achieving 'wealth redistribution' (or a growing labour share of income), 'joint aggrandisement' (a growing wage bill), 'protection' and 'government in industry'. These 'goods' constitute the demand for union membership. However, these are no private goods: one does not have to be a union member to get most of the 'goods' listed by Commons. It is enough that other workers join, since most of these 'goods' are 'collective' in the sense that they cannot feasibly be withheld from non-members. This situation gives rise to the so-called *free-rider* paradox. According to the theory of public goods (Olson, 1965), no individual will rationally join in the cost of production, because they can enjoy the goods for free. The key problem is to explain why any worker would join a trade union when dues are costly and when the benefits are not immediately available or apply to all workers regardless of their membership (Crouch, 1982; Booth, 1985; Naylor, 1989).

In order to escape the free-rider paradox, Olson argued that collective action would only occur if there is either *compulsion* (analogous to the 'closed shop' in which union membership is a condition of employment) or if the union offers *selective incentives*, *i.e.* private goods only to members. In addition to material incentives, Booth (1985) interprets the selective incentives as being the 'reputation' utility that derives from complying with a *social custom* of membership. This idea stems from Akerlof (1980), who defines a social custom as 'an act whose utility to the agent performing it in some ways depends on the beliefs or actions of other members of the community'. In the context of union membership, the social custom is thought of as urging workers not to take a free ride. This social customs

approach considers that the joining decision is socially embedded and that, contrary to Olson's theory, workers may be more prepared to join if (they know or believe that) others join. A similar result on collective action is predicted in the 'resource mobilisation', 'critical mass', 'tipping' or 'threshold' models of Klandermans (1984), Marwell and Oliver (1993), Schelling (1978) and Granovetter (1978). On the basis of these approaches and assuming that workers differ with respect to their sensitivity to solidarity, it has been possible to show that 'open shop' trade unions can exist at various levels of union density despite a potential free-rider threat (Naylor, 1989, 1990; Naylor and Cripps, 1993).¹

Beyond some minimum critical level of density, whether or not there are losses in having some free riders will depend on the quality and cost structure in the provision of union benefits and services (Pencavel 1971). The union's provision of benefits and services may be crucial in obtaining its critical level of membership density in the absence of coercion. In the presence of uncertainty and high individual transaction costs, the union can act as an agent providing for its membership a variety of services (collection of information, contract services, access to legal services, evaluation of wage and fringe benefits, monitoring of firms' performance, aggregation of worker preferences, communication of these to the firm, improving the quality of personnel representatives and works councils, offering favourable terms with insurance companies, *etc.*). Since the cost of provision of these services is subject to 'economies of scale and jointness' characteristics (Faith and Reid 1987), workers gain from sharing an agent rather than individually arranging for provision of the services. Of course, the demand by workers for the services of an 'agent-union' depends on what services are available elsewhere; for instance, private firms or the state may provide some of the services listed above. Workers' demand for union services cannot be considered in isolation, since it is likely to be interdependent with employers' personnel policies, the state's welfare policies and any union involvement in these.

3. Variable selection and expected relationships

In line with our conceptual framework, our hypothesis is that, unions will attract workers if they 'do a good job' in protecting the income, employment, security and dignity of workers—its main functions as listed by Commons—and if they do that at low cost. Unions 'do a good job' if they defend

¹ However, as Elster (1989: 40) notes, 'before a union can force or induce workers to join, it must have overcome a free rider problem in the first place'. In the present paper, dealing with unions and union growth in advanced capitalism, we assume that most membership decisions are about joining, or retaining membership in, *existing* union organizations. Still, the 'second order collective action problem', *i.e.* finding volunteers who will guard the norm or custom of membership (Hechter 1987), may be particularly large at low levels of union density and cause the union to collapse.

employment and wage levels, mitigate the consequences of (temporary) unemployment, and provide workers with representation and protection against abuse in the workplace. Thus, on the benefit side, we expect a negative relation between unemployment and union membership growth, a positive relationship with income security and welfare state provision, and a positive relationship with workplace representation. We consider these variables one by one and introduce some institutional variation.

(i) *Unemployment* may increase the ‘stock of grievances’ of workers and therefore raise the (future) demand for union representation (Ashenfelter and Pencavel 1969), but the dominant effect is that unemployment strengthens the hand of management, makes it more difficult for unions to accomplish their goals and therefore lessens the (immediate) rewards of union membership (Bain and Elsheim 1976). The ability of unions to influence *layoff decisions* is an important intervening variable as this presents a private incentive good. When unions are able to bargain over layoff procedures and obtain preferential treatment for their members, workers are likely to join the union in order to obtain (partial) insurance against the unemployment risk. If workers are heterogeneous in terms of risk aversion, more risk-averse workers join the union and, other things being constant, an increase in aggregate unemployment risk raises union density (Booth, 1984). In this context, we must consider two important conditions related to the union’s ability to influence lay-off and rehiring decisions: the presence of unions in the enterprise or *workplace* (see below), and the *organisation* of unemployment insurance (Holmlund and Lundborg 1999).

(ii) *Unemployment insurance* schemes exist, basically, in two forms (Rothstein 1992): (i) a compulsory system administered by government agencies; and (ii) a voluntary but publicly supported scheme administered by the unions or union dominated funds (the so-called *Ghent system*, after the Belgian town where it was first introduced). State unemployment schemes became mandatory for workers at a relatively early stage in the UK (1911), Austria (1920) and Germany (1927). Norway (1938) and the Netherlands (1952) abandoned the Ghent system for statutory regulation. The mutual insurance schemes in France and Switzerland never grew to such importance for trade unions (Flora 1986). Italy, Spain, Portugal and Greece failed to achieve a comprehensive safety net for the unemployed (Ferrera 1996). The Ghent system is still operating in Sweden, Denmark, Finland and Iceland; in Belgium, unemployment insurance was brought under the control of the state but the unions retained a role in the processing of individual cases for their members, thus offering a highly selective benefit (Martens 1985). In countries with the Ghent system, we expect that the negative relation between unionisation and unemployment be reversed: unemployed members, like workers who anticipate unemployment, tend to join and/or retain membership. Moreover,

union officials retain contact with their unemployed members, albeit only through administrative means. Hence, in these 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.

(iii) Inflation and indexation clauses. If workers are risk adverse, they dislike uncertainty. When we proxy income uncertainty with high or accelerating inflation, we expect this variable to reduce workers' welfare. According to many authors this raises the demand for union protection: '...in as much as workers perceive an increase in the rate of change of retail prices as a threat to their standard of living ... they are more likely to become and remain union members in an attempt to maintain this standard' (Bain and Elsheik 1976). The same authors noted that this effect was attenuated, or negative, when inflation rates were very high and accelerating (as was the case in many countries during the 1970s). However, if unions are able to negotiate quasi-automatic cost-of-living adjustment or indexation clauses, workers will appreciate these clauses more when inflation is higher or accelerating. We expect therefore a positive impact of price uncertainty conditional on the existence of indexation clauses.

(iv) Replacement rates. Still on the benefit side, if worker's appreciation of welfare state provisions passes through the unions (i.e. if they believe that public provisions are more generous, or better defended, when unions are stronger), they will tend to join, or continue membership, whenever they obtain higher benefits (Hicks 1988). Membership among pensioners, which in Europe's main unions has risen to between 10 and 50 percent of total membership (Ebbinghaus and Visser 2000), has probably something to do with this attitude. We can proxy welfare state provision by replacement rates, i.e. the ratio between public subsidy and average wage. This variable most directly measures Common's union function of 'protection'. We expect a positive relationship between replacement rates and union density to hold across years and across countries.

(v) Workplace representation. The workplace appears to be the main locus to recruit new members ('members recruit members'), uphold the 'social custom' of membership and offer services to members (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 under legislation or central agreements 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 (Rogers and Streeck,

eds. 1995). Strong workplace representation not only affects the (selective) benefit of membership, it also affects the cost of joining. If workplace organisation 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 created and defended stronger union representation in the workplace

On the cost side, when deciding to join or stay with the union, workers must consider the price of membership, which is some combination of dues payment, their standing with fellow workers and management opposition or discouragement. Dues may be an important consideration for prospective members, or for members discontinuing their membership.² Unfortunately, we have no comparative data, across years and countries, to introduce this variable in our empirical work. Instead, we use three proxies capturing some of the costs of membership from the perspective of workers; two (centralisation and government employment) relate to union recognition and the attenuation of employer opposition, the third (strike participation) to the social and organisational ties with fellow workers.

(vi) *Centralisation*. Unions can be conceptualised as operating in two markets: one for membership, and one for recognition (Willman 1989). Union may have to show organising abilities before gaining recognition, but recognition is often a condition for providing benefits and services to members, and hence a basis for attracting a stable or growing membership (Wood and Godard 1999). 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). Blanchflower and Freeman (1990) argue that higher-level bargaining is likely to weaken employer resistance to union organising, partly because the union premium or mark-up on wages will be lower than under single-employer bargaining. Another reason, mentioned by Sisson (1987), is that under multi-employer bargaining union interference in workplace management tends to be less intense. Moreover, under centralised and multi-employer bargaining arrangements unions have usually an easier task to establish themselves in the small firm sector and gain recognition as the representative of workers in new sites and businesses, at

² In a representative survey of ex-union members in the Netherlands, a quarter mentioned the high cost of membership ('dues are too high') as the principal reason for quitting the union (Klandermans and Visser 1995: 88). The tendency for dues to rise less than wages, and the fact that the lowest dues are found in industries and countries where there is severe competition among unions, are further indicators that price considerations are not trivial (Streeck and Visser 1998; Willman *et al.* 1993).

least if newcomers sign up as members of employers federations. We expect, therefore, that union membership is higher, and union growth stronger, wherever unions have been able to create and defend centralised institutions of collective bargaining with employers.³

(vii) Government employment. As a rule, unions in Europe have gained preferential recognition and staff representation rights in the public service and often public sector unions have an extended role in personnel management (Blanpain 1993; Ebbinghaus and Visser 2000; Sturmthal 1966). Therefore, we have included government employment among our variables on the expectation that it is easier to unionise government employees in the absence of strong managerial opposition and/or the possibility of providing selective benefits to members.

(viii) Strike participation. In the social custom approach to unionisation social attitudes with regard to social solidarity and union membership are highly relevant variables. Changes in social values and expectations of workers towards unions, in conjunction with compositional shifts in the labour market (see below), are obvious candidates in an explanation of the decline of (the social custom of) union membership (Lipset 1986). Historically, the core of the trade union movement was the manual working class in industry and transport. Its strength derived from a number of distinctive conditions of traditional working life: concentration of employment in large factories, a sharp distinction in status and authority between (manual) workers and (non-manual) staff, the insecurity of jobs and income, and in some cases the strength of working class communities. All these conditions generated a sense of collective identity and awareness that improvement was more likely through collective action than through individual effort (Lockwood 1958). With the decline in manufacturing and the rise of small firms, fewer workers find themselves in structural conditions conducive to collective organisation. Survey and public opinion data concerning trade unions or union membership exist only on a scattered basis, hardly comparative and not as a time series stretching back to the 1950s. We have therefore decided to use strike participation as an indirect measure of conforming behaviour among workers responding to strike calls of their unions or fellow workers.⁴ We are aware that this variable, in addition to measuring support for the union as an instrument of collective action, is also an indirect measure of the resources

³ A corollary finding, not studied here, is that the variation in cross-industry and cross-firm unionisation rates is lower under conditions of centralisation (Visser 1990).

⁴ Excluding 'attitudes' from our explanatory variables may not be so detrimental to our analysis, since surveys, at least in the UK and the Netherlands, show few and only small attitudinal differences between members and non-members (Gallie 1996; Klandermans and Visser 1995). Changes in employment relations and conditions, especially for women and newcomers (Gallie *et al.* 1998; Visser and Van Rij 1999), seem far more decisive. In the British case the 'key explanation of non-membership appears to be the inability of unions to make contact with, or provide sufficient support to, potential members' (Waddington and Whitston 1997).

available to unions and of the selective benefits that the union offers to workers by way of strike replacement rates. The data do not allow us to distinguish between official (union organised) and unofficial (wildcat) strikes, or those caused by employer lockouts. Inevitably, strike participation data reflect legal and institutional differences and obstacles to striking and union activities, and differences in statistical treatment of strikes (Korpi and Shalev 1979).

In addition to these institutional and, in part, cyclical variables, we must also consider compositional effects, relating to the structure of the labour market and affecting the cost structure of union organising efforts. Approaching the problem of union organising as an investment problem, establishing the union as an effective bargaining agent for its members (Shister 1967), 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 organise—those in large firms, with stable employment relations and established workplace representation rights, and from social backgrounds and with political views favourable to unionism—are already in the union.⁵ Expanding or creating the unionism outside these customary domains is more costly, both for the unions and for the worker. A related reason is that, other thing being equal, employers in the intensive-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 the consumer or tax-payer (Hirsch and Berger 1983).

Thus, in all countries and in all years we tend to find lower unionisation rates in private services, small firms, among workers with flexible and unstable jobs, and among part-timers (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 (many) women have found stable employment in the public sector.

(ix) Labour market participation. 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 these 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 individuals (women, young workers, service workers, those working under non-standard employment contracts) with lower propensity to unionise. We expect therefore a negative relationship between rising labour participation and union growth. In

⁵ 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’.

order to prevent the mixing up of this variable with (cyclical) changes in unemployment, we shall use the employment rate in our regressions.⁶

4. Methodological approach

If we search for 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

$$DEN_t = \alpha_0 + \alpha_1 UNE_t + u_t \quad (1) \text{ where}$$

u_t is an i.i.d. random disturbance. If equation (1) cannot be directly estimated because of non-stationarity of the independent variable, using first differences can overcome the problem:

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

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,

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

the same equation (1) can be rearranged as in the error correction mechanism representation (See Harvey 1981):

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

or using a more compact notation:

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

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

⁶ Formally, the unemployment rate UNE, employment rate EMPL and participation rate PART are related in the following way: EMPL = PART (1 - UNE). It follows that if a higher participation rate has a negative impact on union density, then one should also expect a negative coefficient for the employment/population ratio in the estimations.

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.⁷ We have 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 dependent variable (today's actual unemployment is replaced by its prediction based on instruments). Under the first alternative, which is our preferred strategy, the general form of the estimated model is

$$\Delta DEN_t = \beta_0 + \gamma_1 \Delta UNE_{t-1} + \gamma_2 DEN_{t-1} + \gamma_3 UNE_{t-2} + u_t \quad (6)$$

where all values of UNE have been lagged one year.⁸

5. The data

The data utilised 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 workers and salaried employees in employment. The labour force data are from the OECD's Labor Force Statistics. A full description of the data and data sources used for the independent variables is presented in the appendix.

Union density rates are presented in Figure 2, both in levels and first differences. 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 (Figure 3).¹⁰ In

⁷ 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.

⁸ The alternative route of instrumental variables has been explored in Boeri *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.

⁹ The countries are Austria, Belgium, Denmark, Finland, France, (West) Germany, Great Britain, Italy, Ireland, Netherlands, Norway, Spain, Sweden, and Switzerland. When national sources provided longer series, we have used their growth rates to extend international source data, in order not to lose degrees of freedom.

¹⁰ The use of first differenced variables eliminates the problem of non-stationarity in all cases but two, Italy and Switzerland (test statistics are available upon request). We may therefore avoid the use of logistic transformation in order to obtain normally distributed residuals (as proposed in Booth 1983).

addition, normality tests do not reject the assumption of normality for the first differenced variable. The potential existence of co-integrating 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.¹¹

All variable means are reported in Table 1 (available samples); pair-wise correlation and available observations are reported in Table 2. Inspecting the correlation coefficients in the first column of Table 2, we notice that union density seems 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, strike participation and the centralisation exhibit opposite signs in correlation with union density. However, when we consider the first differenced variables (Table 3), some correlations change sign (unemployment and employment, as well as centralisation and strike participation). In all cases, these could just be spurious correlations and multivariate analysis is required to establish the value of this evidence.

6. Results

In Table 4 we report our main results. We estimate a fixed effect model, to allow for unobserved country differences. The coefficients are least square projections using the Huber-White standard error estimator to account for potential heteroschedasticity. The estimation period is 1950-1997, with some exceptions due to missing data.¹² In this Table we gradually introduce some institutional regressors, in order to assess their explanatory contribution. Our preferred model is reported in the fourth column, and we will stick to it in our comments. The fifth column replicates the same model but introduce a variable for financial openness, at the cost of excluding two countries (Finland and Spain) for which we do not have information.

We 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 run and less negative in the long run. When going to country-level estimation of the same model, as is done in Table 5, there are some divergent patterns

¹¹ See Engle and Granger 1987. For a similar approach see Carruth and Disney 1988, and Carruth and Schnabel 1990.

¹² Due to missing values, we have reduced the samples for six countries: Finland 1955-96, Belgium 1952-95, Ireland 1957-96, Austria 1952-94, France 1961-94 and Spain 1982-96.

in the short run effect (only Sweden has a positive short run effect), whereas in the long run the only exception is presented by Britain.¹³

When we consider unemployment benefits (as measured by replacement rates), we find a positive impact in the short run, which however is not very strong from a statistical point of view. However it is strongly significant and positive in the long run. All other things equal, raising the replacement rate by 10 percent points yields an increase in union density by 4 percent points.¹⁴

With respect to inflation, 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, as expected, unless indexations clauses are present. With indexation, rising inflation has a positive impact on union growth, as can easily be seen by taking the difference between the two coefficients. In the country-by-country estimate of our model, this indexation effect finds support in the Belgian and Italian case, two countries with pervasive and enduring indexation systems (van Ruysseveldt and Visser 1996), but is contradicted by the Irish one.¹⁵ Our model retains a positive and robust impact of inflation interacted with indexation in the long run (in the order of 1.8 point of density for any additional point of inflation).

Workplace representation 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 1.4 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 di Lavoratori* in 1970, and Great Britain, after the rise to power of Mrs. Thatcher, represent textbook example of this type of changes, and it is not by accident that the coefficients for this variable are very significant in our country-level estimations for both countries. Other countries showing a significant positive impact of (changes in) workplace representation are Finland, Germany and the Netherlands, whereas the case of Ireland is controversial.

Switching to the cost side, the greater difficulty of union organising in case of newcomers (women, youngsters) is witnessed by the negative sign obtained for the employment rate. Given an estimate of nearly 0.4 on the first differences, it suggests that a 10 percent increase in the employment rate (as experienced by the Netherlands in the 1980s or 1990s) entails a reduction in density of 3.7

¹³ We do not have a convincing explanation for the positive long-run effect of sign of unemployment on unionisation in Britain, especially when considering that union density fell during three out of four hikes in unemployment since 1950s (but not during stagflation in the 1970s).

¹⁴ As a result of dividing the coefficient of the lagged replacement rate (0.013) by the coefficient of the lagged density rate (0.034).

¹⁵ The Irish case is also atypical with respect to inflation in other papers, like Roche and Larragy 1990. They attribute the insensitivity of union density to inflation to the fact that as a consequence of large-scale migratory flows between both countries Ireland and the UK represent a unified labour market, where only the *differentials* between inflation rates matter.

percent, other things held constant. This variable keeps its sign and significance in eight out of fourteen countries. The other compositional variable, public employment share, comes also out positive and significant. Its impact is statistically weakened when we go to country estimates and appears to hold only for the country with the strongest statute on civil service, i.e. Germany (see Blanpain 1993).

Centralisation has also a significant, positive and robust impact on unionisation. In the unlikely case that centralised bargaining would collapse overnight, and be replaced by fully decentralised (single-employer) bargaining, union density would decrease by 1.8 percent points on a yearly basis, other things equal. In our country-specific runs of the model we find a significant and strong impact in the case of Finland, Norway, the Netherlands, Great Britain and France, though in the case of Norway centralisation appears to hamper union growth.

Finally, when strike participation (as a proxy of mobilising resources or goodwill for the union) is taken into account, its impact is again positive, but not very strong. This is probably due to the very large cross-national variation of this variable, ranging from 0.36 for Italy to virtually nil for Switzerland.¹⁶

On the whole we believe that our model fits the data rather well. Specification tests (Hausman test) suggest that the random effect estimator is not a better alternative, therefore suggesting that we are really capturing a general model that is valid both across countries and across years. In addition its validity can be appraised by looking at static predictions (without cumulating prediction errors) and dynamic predictions (cumulating prediction errors), respectively reported in Figures 4 and 5.¹⁷

More impressive, we believe, is that the model exhibits dynamic stability, even if it regresses to the long run equilibrium at very low speed (it takes some 30 years to reach the theoretical steady state implied by the cointegrating vector). Moreover, when we restrict the estimation sample to the years before 1985 in order to perform 'out of sample predictions', the estimated coefficients retain their sign and significance (Table 6). Inspecting these predictions in differences (Figure 6) and in levels (Figure 7) we observe that our model performs well in the case of most countries, though the model clearly underpredicts the Belgian, the Swedish and Spanish upsurge in unionisation in the 1990s, and overpredicts unionisation in Austria and Switzerland in these years.

¹⁶ In single country regressions we found only a significant positive effect of strike participation in countries with old 'syndicalist' traditions, i.e. Norway, Italy, France and Spain (see Ebbinghaus and Visser 2000).

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

7. *Relationship with related literature*

Many authors have estimated cross-sectionally union density averages.¹⁸ 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, Lange and Scruggs 1999 and Oskarsson 2001). Each estimates models of union density using pooled cross sections of several countries and all focus on labour market institutions.¹⁹ It is therefore pertinent to highlight common results and differences.

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 impact of *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 error correction component. His results, therefore, describe short-term effects.²⁰ 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 'centralisation 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/or in countries with centralised wage bargaining systems.

Both Lange and Scruggs (1999) 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 globalisation. Lange and Scruggs estimate a short-term model in first differences²¹ for 16 countries between 1960 and 1989. While controlling for cyclical components (GDP growth rate, unemployment rate, government partisanship, government 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 liberalisation. The

¹⁸ For two recent attempts and overviews of the literature: Lipset and Katchanovski 2001; and Ebbinghaus and Visser 1999.

¹⁹ Moreover, like us, these authors use the same data sources and methods for measuring the dependent (union density) variable.

²⁰ Though we cannot be sure of this, since the 'steady state' assumption is probably violated.

²¹ 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.

authors deal with the institutional aspects by creating a single measure of 'union compatible institutions', which is the sum of three indicators (as identified in Ebbinghaus and Visser 1999): Ghent, bargaining centralisation and workplace representation. This variable is then interacted with all regressors. The paper's main finding is that increased financial openness is associated with increasing density in highly institutionalised countries, whereas it is detrimental to unions in weakly institutionalised countries.²²

In similar fashion, Oskarsson (2001) proposes an 'institutional index', which is the product of centralisation and workplace representation summed to a dummy for Ghent countries. His claim that '... it is the combination of centralised 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.²³

With respect to these previous findings, our model suggests several improvements. First of all, it lengthens the sample size significantly, by including two additional decades (1950s and 1960s) and some later years. Second, we allow for greater variety of labour market institutions: Ghent unemployment insurance, wage indexation, bargaining centralisation, 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 Lange and Scruggs (1999) and Oskarsson (2001) is that pro-union institutions are measured along a unique dimension, which is also time invariant. Without interaction with regressors, this would be equivalent to estimating a country specific fixed effect and consequently its explanatory contribution would be indistinguishable from introducing a set of country specific dummies.²⁴ Since the single institutional variable varies between

²² 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 fifth column of Table 4. 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.

²³ Additional short-term effects are reported for government employment (positive), services (negative) and financial liberalization (negative).

²⁴ In addition, if the model is estimated in first differences (as in Western 1997 and Lange and Scruggs 1999), the country specific effect affects the change and not the level. Therefore their

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 rest of countries. But this does not help us to understand how labour market institutions influence union organising in every country.

Unlike the other studies, we have deliberately avoided to include 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 centralisation, stronger rights for shop stewards and higher replacement rates, is pro-union, independently from its ideological roots or self-declared goals. Since we are already controlling for each of these interventions, there is no need for an additional 'catch all' variable (moreover, not all 'left-oriented' governments conduct pro-union policies; the direct measurement institutional variation, through policies rather than government composition, is 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.²⁵ In addition, it also indicates the mobilising resources available to union leaders and, indirectly, the relative power that unions can bring to bear.

Last but not least, our model is robust in country-by-country estimations and in the 'out of sample' simulation.²⁶ Our simulation indicates that, at least 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 rates went down and/or indexation clauses were dismantled, replacement rates were lowered, public employment shrank and strike activity declined.

8. Conclusions

The results of our analysis suggest that union decline in the 1980s and 1990s is entirely endogenous to labour market changes but that the impact is mediated by a specific and limited set of labour

institutional explanation concerns differences in trends, leaving unexplained differences in levels. Country differences in level can only be accounted by an error correction component.

²⁵ See Checchi and Corneo (2000) for a full discussion of this aspect.

²⁶ Western (1997) is the only author providing analogous tests, but in country by country estimates he does not provide statistical significance of the coefficients.

market institutions. A higher participation rate, bringing into employment more people with lower qualifications or less stable commitments to the labour market, as is currently advocated by the European Union under its Employment Strategy, is likely to hurt the unions, according to our analysis, both in the short and in the long run.

Our model, although indicating a stable dynamic relationship in the long run, suggests that convergence occurs at rather low speed – only around 3% of the deviation of the long-run relationship is eliminated per 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 have to imply a return to union growth.

The main limitation of our analysis is that we have treated the trade unions as ‘passive’ organisations, on the receiving end of structural, cyclical and institutional changes affecting the decisions of workers and employers. However, unions do react to decline, through mergers, new services or recruitment drives. Another limitation is that we are implicitly assuming homogeneity among the workers, whereas costs and benefit are unequally distributed among the workers. Therefore in the future we intend to differentiate between union strategies and explore the relationship between wage compression and density, in order to ascertain whether there have been differential incentives to union joining according to skill levels and the policies that unions conduct.

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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	Netherlands	Austria	France	Switzerland	Spain
55-96	52-95	52-96	52-96	52-96	52-96	52-96	57-96	52-96	52-96	52-94	61-94	52-96	82-96
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
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
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
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
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
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
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
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

Legend:

- DEN = union net density (active dependent members, excluding unemployed or retired)
 UNE = unemployment rate (unemployed/labour force)
 EMPL = employment rate (employed/population)
 INFL = inflation rate (consumer price index)
 CENTR = degree of centralisation in wage bargaining
 SPART = strike participation (strikers/employees).
 BENEFIT = replacement rate (unemployment subsidy/average wage)
 PA = governmental employment share in dependent employment

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

	DEN	UNE	EMPL	INFL	CENTR	SPART	BENEFIT	PA
DEN	1.0000 <i>657</i>							
UNE	-0.1633* <i>651</i>	1.0000 <i>712</i>						
EMPL	0.2796* <i>656</i>	-0.5992* <i>707</i>	1.0000 <i>712</i>					
INFL	0.1640* <i>628</i>	0.0712 <i>679</i>	- <i>679</i>	1.0000 <i>680</i>				
CENTR	0.5193* <i>655</i>	0.3006* <i>673</i>	0.0690 <i>678</i>	- <i>650</i>	1.0000 <i>680</i>			
SPART	- <i>606</i>	- <i>610</i>	- <i>615</i>	- <i>599</i>	- <i>610</i>	1.0000 <i>615</i>		
BENEFIT	0.1125* <i>616</i>	0.3397* <i>631</i>	0.0455 <i>636</i>	0.0654 <i>620</i>	0.0165 <i>621</i>	0.2030* <i>605</i>	1.0000 <i>637</i>	
PA	0.4714* <i>617</i>	0.1255* <i>628</i>	0.2132* <i>628</i>	0.0524 <i>611</i>	0.0370 <i>622</i>	- <i>592</i>	0.1564* <i>599</i>	1.000 <i>629</i>

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

	ΔDEN	ΔUNE	ΔEMPL	ΔINFL	ΔCENTR	ΔSPART	ΔBENEFIT	ΔPA
ΔDEN	1.0000 <i>642</i>							
ΔUNE	0.1678* <i>636</i>	1.0000 <i>697</i>						
ΔEMPL	-0.2223* <i>641</i>	-0.6978* <i>692</i>	1.0000 <i>697</i>					
ΔINFL	0.0225 <i>613</i>	-0.1563* <i>664</i>	0.1931* <i>664</i>	1.0000 <i>665</i>				
ΔCENTR	0.1441* <i>640</i>	-0.0615 <i>660</i>	0.0213 <i>665</i>	-0.0207 <i>637</i>	1.0000 <i>680</i>			
ΔSPART	0.0714 <i>592</i>	-0.0208 <i>596</i>	0.0060 <i>601</i>	0.0050 <i>585</i>	-0.0037 <i>597</i>	1.0000 <i>601</i>		
ΔBENEFIT	0.1036* <i>602</i>	0.0314 <i>617</i>	-0.0184 <i>622</i>	-0.0015 <i>606</i>	0.0610 <i>608</i>	0.0118 <i>591</i>	1.0000 <i>622</i>	
ΔPA	0.2504* <i>603</i>	0.3482* <i>614</i>	0.3324* <i>614</i>	-0.0446 <i>597</i>	0.0228 <i>609</i>	0.0110 <i>578</i>	0.1069* <i>585</i>	1.0000 <i>615</i>

Legend: see Table 1

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

# obs :	578	578	578	560	545
Depvar:	Δ den	Δ den	Δ den	Δ den	Δ den
intcpt	0.000 (-0.08)	0.000 (-0.10)	0.000 (-0.10)	0.003 (0.73)	0.003 (0.67)
Δ une ₋₁	-0.241 (-4.14)	-0.246 (-4.21)	-0.251 (-4.30)	-0.277 (-4.82)	-0.262 (-4.17)
Ghent* Δ une ₋₁	0.328 (3.94)	0.335 (4.02)	0.337 (4.05)	0.367 (4.52)	0.359 (4.26)
Δ infl	-0.044 (-2.15)	-0.046 (-2.25)	-0.046 (-2.26)	-0.058 (-2.89)	-0.058 (-2.84)
indx* Δ infl	0.073 (2.50)	0.073 (2.48)	0.073 (2.51)	0.076 (2.61)	0.075 (2.56)
Centr	0.020 (4.60)	0.020 (4.57)	0.020 (4.58)	0.018 (4.28)	0.019 (4.30)
Δ empl	-0.334 (-5.14)	-0.334 (-5.13)	-0.337 (-5.20)	-0.376 (-6.03)	-0.378 (-5.94)
Workplace	0.015 (3.80)	0.015 (3.85)	0.015 (3.80)	0.014 (3.51)	0.013 (3.12)
Δ spart ₋₁		0.006 (1.39)	0.006 (1.38)	0.008 (1.98)	0.011 (2.28)
Δ benefit			0.039 (1.78)	0.033 (1.59)	0.034 (1.62)
Δ pa ₋₁				0.102 (1.62)	0.091 (1.41)
Capital controls				-0.002 (-0.37)	
<i>error correction component</i>					
den ₋₁	-0.029 (-3.99)	-0.028 (-3.98)	-0.029 (-4.05)	-0.033 (-4.53)	-0.033 (-4.18)
une ₋₂	-0.149 (-8.00)	-0.148 (-7.98)	-0.147 (-7.94)	-0.136 (-7.67)	-0.132 (-6.44)
Ghent*une ₋₂	0.117 (3.50)	0.116 (3.46)	0.118 (3.54)	0.104 (3.24)	0.102 (3.11)
indx ₋₁ *infl ₋₁	0.034 (2.89)	0.033 (2.86)	0.032 (2.79)	0.046 (3.98)	0.045 (3.81)
benefit ₋₁	0.015 (3.10)	0.015 (3.08)	0.015 (3.19)	0.013 (2.78)	0.014 (2.63)
<i>changes of definitions</i>					
def1	0.064 (6.44)	0.064 (6.43)	0.064 (6.45)	0.063 (6.78)	0.063 (6.71)
def2	-0.071 (-7.21)	-0.071 (-7.22)	-0.070 (-7.18)	-0.070 (-7.58)	-0.070 (-7.53)
def3	0.048 (4.88)	0.048 (4.88)	0.048 (4.87)	0.049 (5.26)	0.049 (5.23)
def4	0.029	0.029	0.029	0.029	0.000

	(2.90)	(2.91)	(2.92)	(3.03)	(0.0)
R ² (within)	0.382	0.384	0.388	0.430	0.420
Hausman	6.94	7.94	2.86	---	25.04

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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). Hausman is a specification test against the random effect estimation. The last column excludes Spain because of lack of data on capital controls.

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 5 - Determinants of union density – country by country estimates
(standard errors in parentheses - ** indicates statistical significance at 99%; * indicates statistical significance at 95%)

countries:	Finland	Belgium	Sweden	Denmark	Norway	Italy	Britain	Ireland	Wst.Germ.	Nethlnd	Austria	France	Swtzlnd	Spain
# obs :	35	44	45	45	45	45	40	45	45	36	45	15		
Depvar:	dden	dden	dden	dden	dden	dden	dden	dden	dden	dden	dden	dden	dden	dden

intcpt				0.102**	0.040**	-0.032*	0.066**		-0.019*	0.060**		0.073**		
				(0.034)	(0.012)	(0.014)	(0.023)		(0.009)	(0.019)		(0.021)		
Δ une ₋₁	-0.264	-0.201	0.364*		-0.108	-0.596**		-0.217	-0.227	-0.338**		-0.224	-0.257	
	(0.239)	(0.128)	(0.177)		(0.152)	(0.225)		(0.124)	(0.122)	(0.072)		(0.228)	(0.321)	
Δ infl	-0.062	-0.362		-0.125*				-0.141*	-0.080*	-0.064**		-0.034	-0.064	
	(0.094)	(0.294)		(0.061)				(0.060)	(0.033)	(0.021)		(0.047)	(0.158)	
indx* Δ infl		0.316			0.097		-0.083							
		(0.308)			(0.060)		(0.044)							
Centr	0.055*			-0.044**		0.044**	0.021	0.031	0.041**		0.076*	0.188	-0.075	
	(0.023)			(0.012)		(0.009)	(0.016)	(0.030)	(0.016)		(0.031)	(0.175)	(0.049)	
Δ empl	-0.564	-0.530	-0.443*	-0.556**	-0.695**		-0.575*	-0.653*		-0.240*			-0.618**	
	(0.30)	(0.454)	(0.191)	(0.160)	(0.162)		(0.256)	(0.331)		(0.106)			(0.116)	
Workplace	0.072				0.034**	0.068**	-0.075*	0.032**	0.023					
	(0.045)				(0.010)	(0.022)	(0.029)	(0.010)	(0.015)					
Δ benefit		0.170	0.141**		0.042	0.109		0.736**		0.040			-0.094	
		(0.107)	(0.053)		(0.047)	(0.149)		(0.205)		(0.033)			(0.219)	
Δ pa ₋₁	0.786			0.326	0.167		0.194	0.272*	0.247		0.213	0.231		
	(1.115)			(0.20)	(0.211)		(0.138)	(0.120)	(0.183)		(0.281)	(0.217)		
error correction component														
den ₋₁	-0.146*	0.036**	0.007*	0.020**	-0.154*	-0.052	-0.072**	-0.047	-0.058*	-0.063**	0.030*	-0.251**	-0.033	-0.043
	(0.061)	(0.010)	(0.003)	(0.008)	(0.061)	(0.039)	(0.028)	(0.031)	(0.026)	(0.021)	(0.015)	(0.059)	(0.035)	(0.053)
une ₋₂	0.188*	-0.145**	-0.144	-0.141*	-0.005	-0.391**	0.211	-0.126**	-0.141**	-0.128**	-0.121	-0.327**	0.033	-0.230**
	(0.083)	(0.047)	(0.077)	(0.062)	(0.073)	(0.087)	(0.121)	(0.048)	(0.033)	(0.043)	(0.092)	(0.097)	(0.145)	(0.075)
indx*infl ₋₁	0.048		0.068**					0.068						
	(0.066)		(0.025)					(0.050)						

changes of definitions

def1						0.058**															
						(0.014)															
def2																					
def3																					
def4																					
-----R ²															0.723						
0.418	0.821	0.457	0.448	0.662	0.721	0.551	0.801	0.613	0.36	0.513	0.661	0.812	DW	1.99	1.27	1.86					
1.74	1.71	1.21	2.18	1.27	1.13	1.58	1.59	2.04	1.24	1.85											

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.

**Table 6 – Robustness test: sample reduction and out of sample prediction (fixed effects)
(t-statistics in parentheses)**

	1952-96	1952-84
sample	1952-96	1952-84
# obs :	560	411
Depvar:	dden	dden

intcpt	0.003	0.002
	(0.73)	(0.48)
Δ une ₋₁	-0.277	-0.263
	(-4.82)	(-3.48)
Ghent* Δ une ₋₁	0.367	0.470
	(4.52)	(4.08)
Δ infl	-0.058	-0.066
	(-2.89)	(-2.94)
indx* Δ infl	0.076	0.083
	(2.61)	(2.60)
Centr	0.018	0.021
	(4.28)	(3.62)
Δ empl	-0.376	-0.324
	(-6.03)	(-3.50)
Δ spart ₋₁	0.008	0.012
	(1.98)	(2.21)
Work	0.014	0.017
	(3.51)	(3.26)
Δ benefit	0.033	0.030
	(1.59)	(1.18)
Δ pa ₋₁	0.102	0.037
	(1.62)	(0.48)
 error correction component		
den ₋₁	-0.033	-0.041
	(-4.53)	(-3.87)
une ₋₂	-0.136	-0.133
	(-7.67)	(-5.17)
Ghent*une ₋₂	0.104	0.097
	(3.24)	(1.99)
indx ₋₁ *infl ₋₁	0.046	0.045
	(3.98)	(3.25)
benefit ₋₁	0.013	0.016
	(2.78)	(2.30)
 changes of definitions		
def1	0.063	0.064
	(6.78)	(6.51)
def2	-0.070	-0.069
	(-7.58)	(-7.17)
def3	0.049	0.000
	(5.26)	(0.0)
def4	0.029	0.000
	(3.03)	(0.0)

R ² (within)	0.43	0.40
=====		

Notes: see Tables 1-5.

FIGURE 1

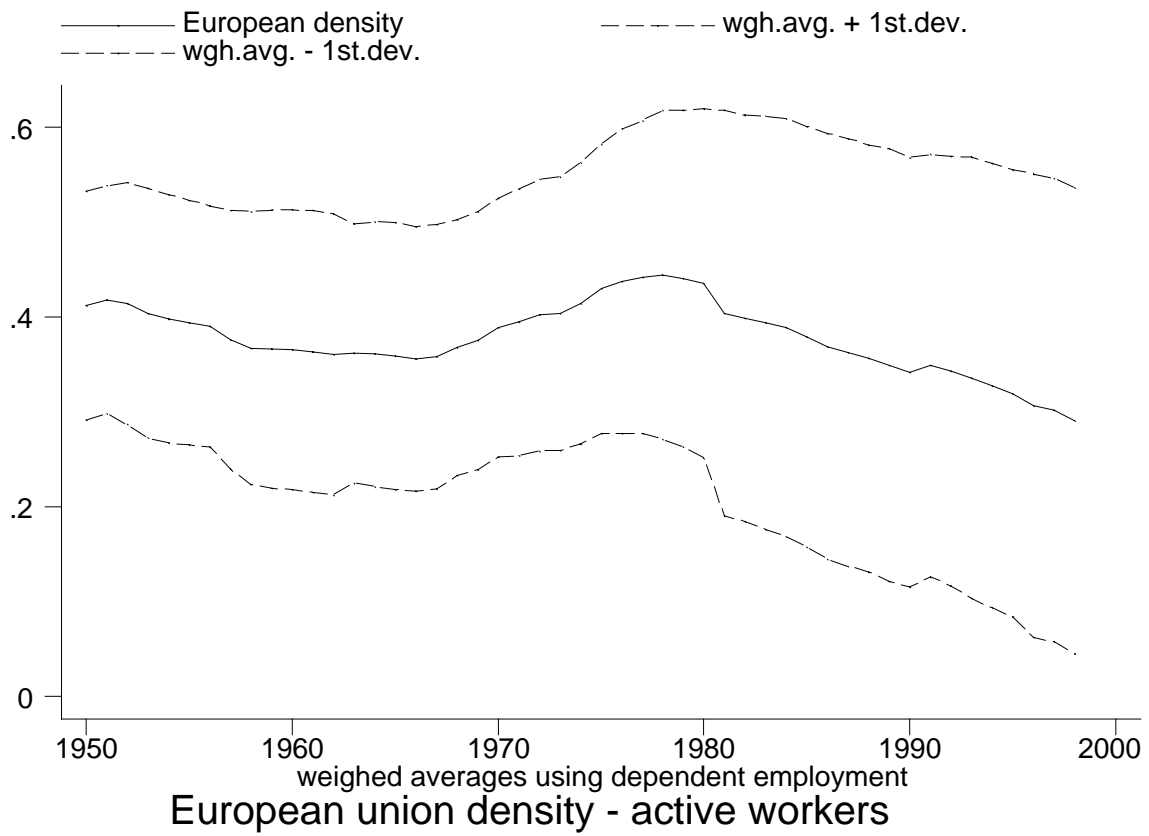


FIGURE 2

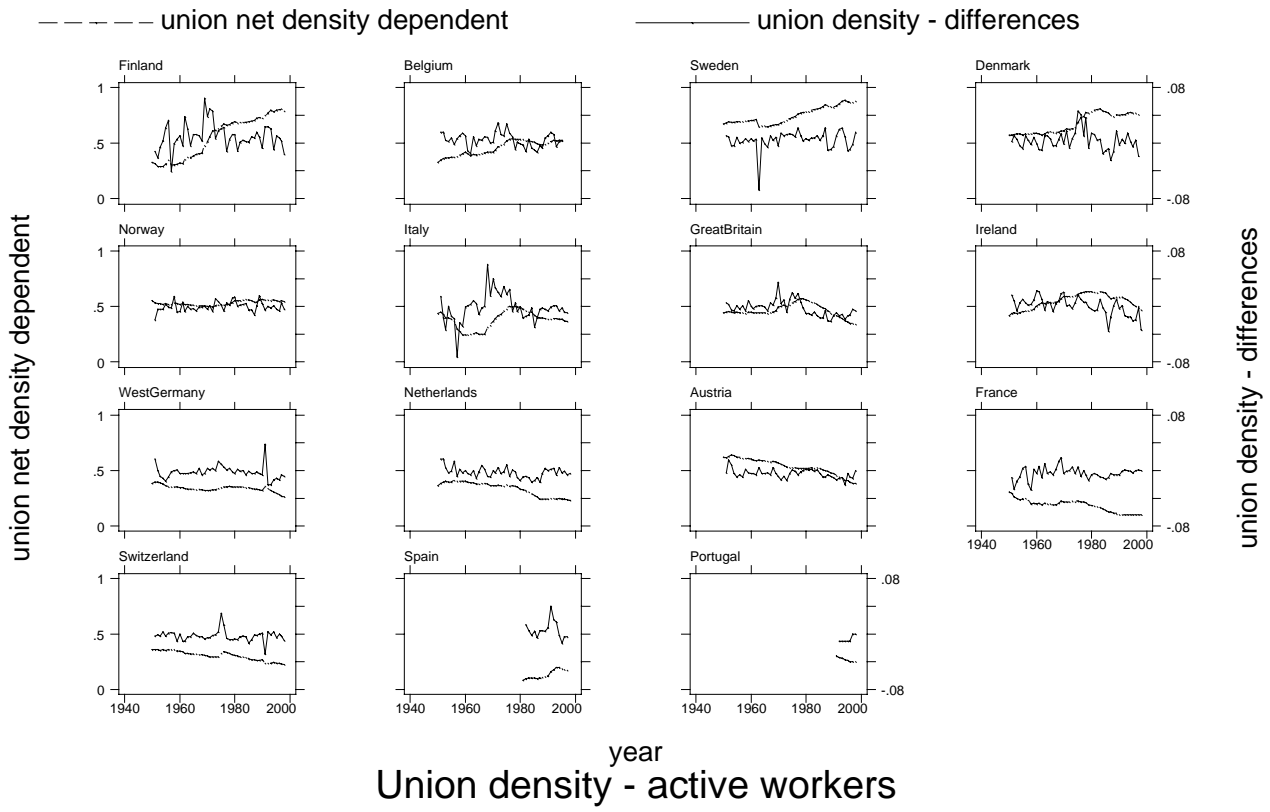


FIGURE 3

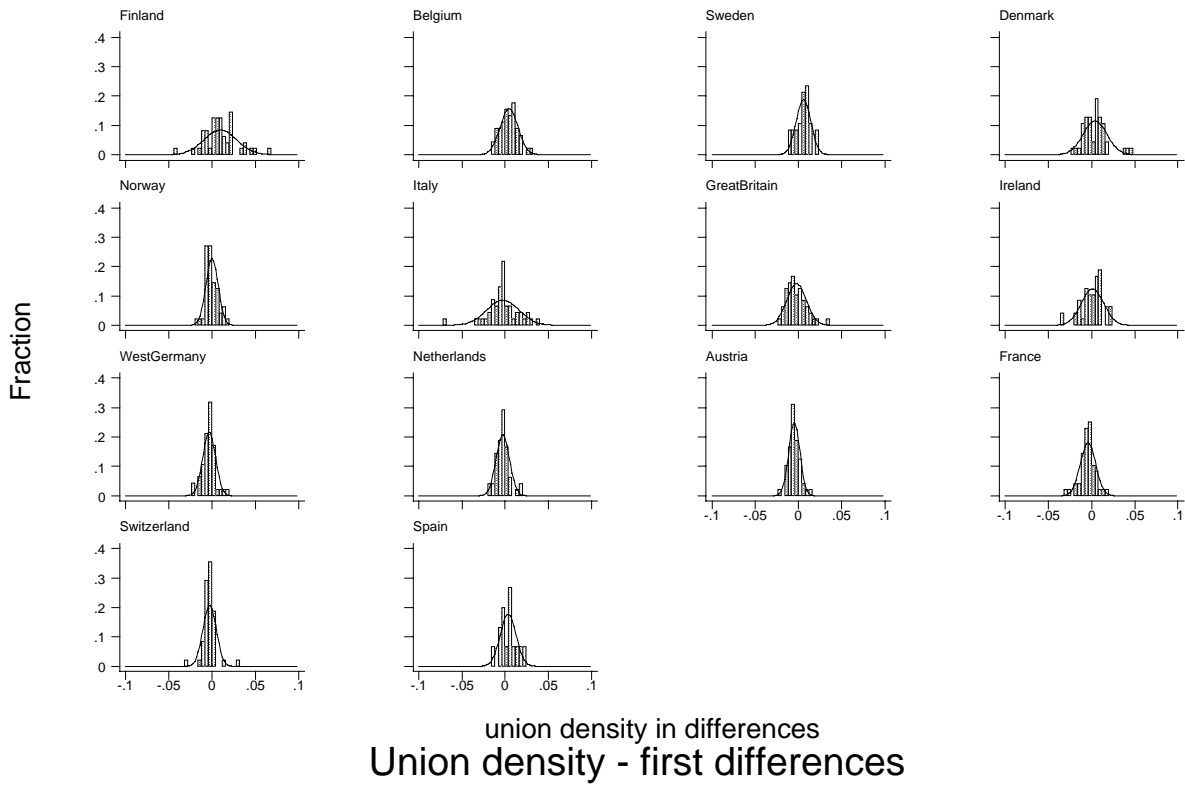


FIGURE 4

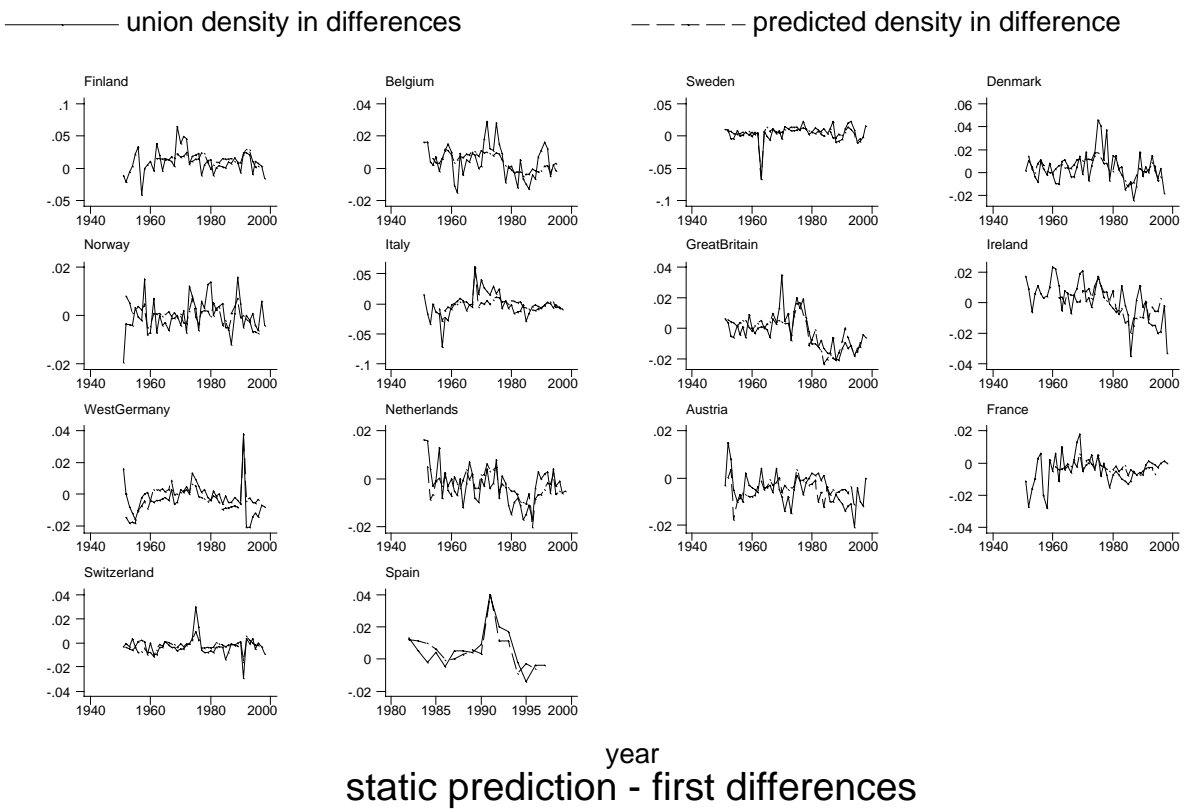
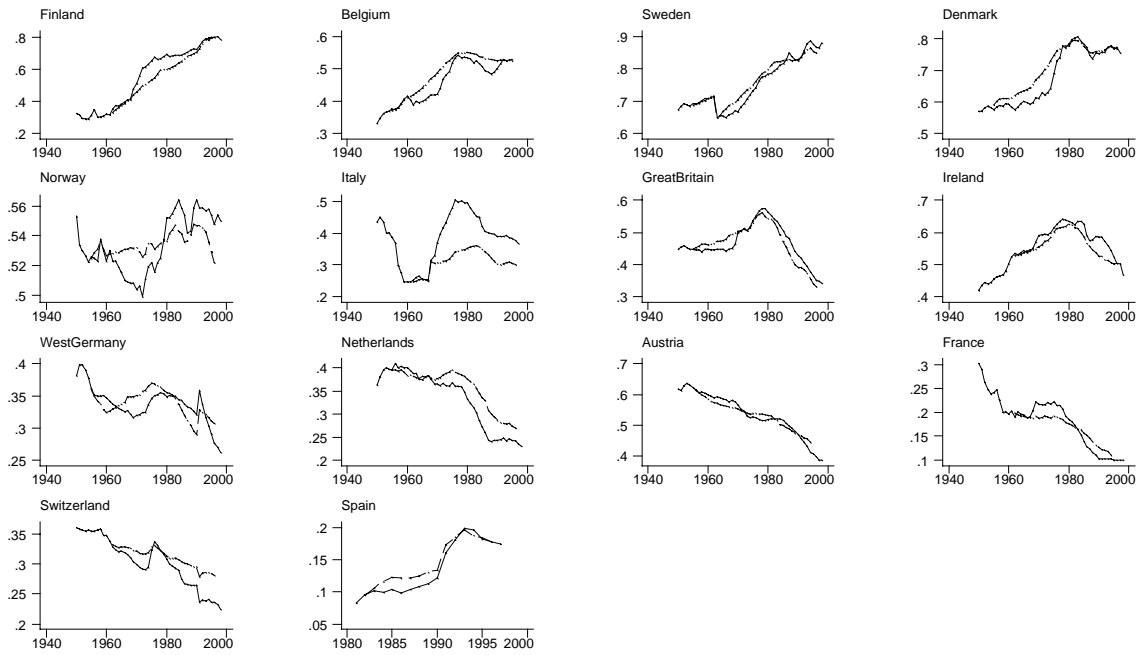


FIGURE 5

———— union net density dependent

- - - - - predicted union density



year
dynamic prediction - levels

FIGURE 6

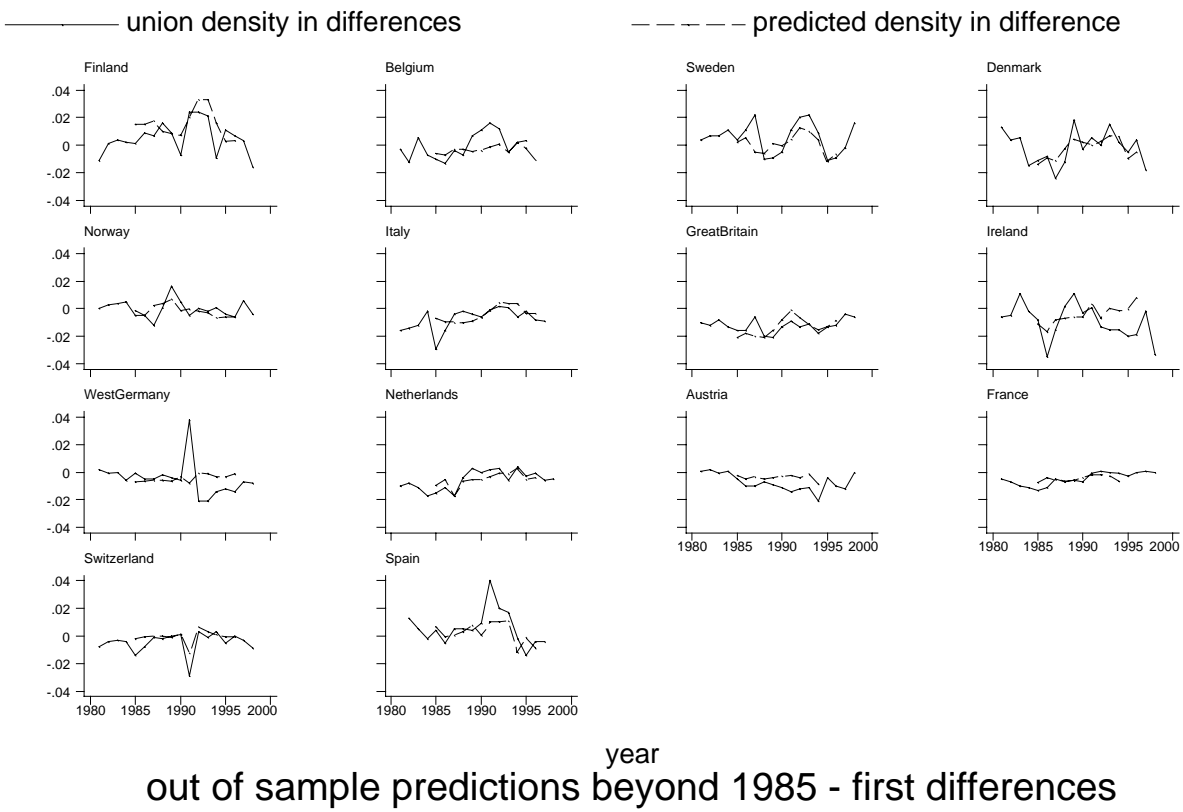
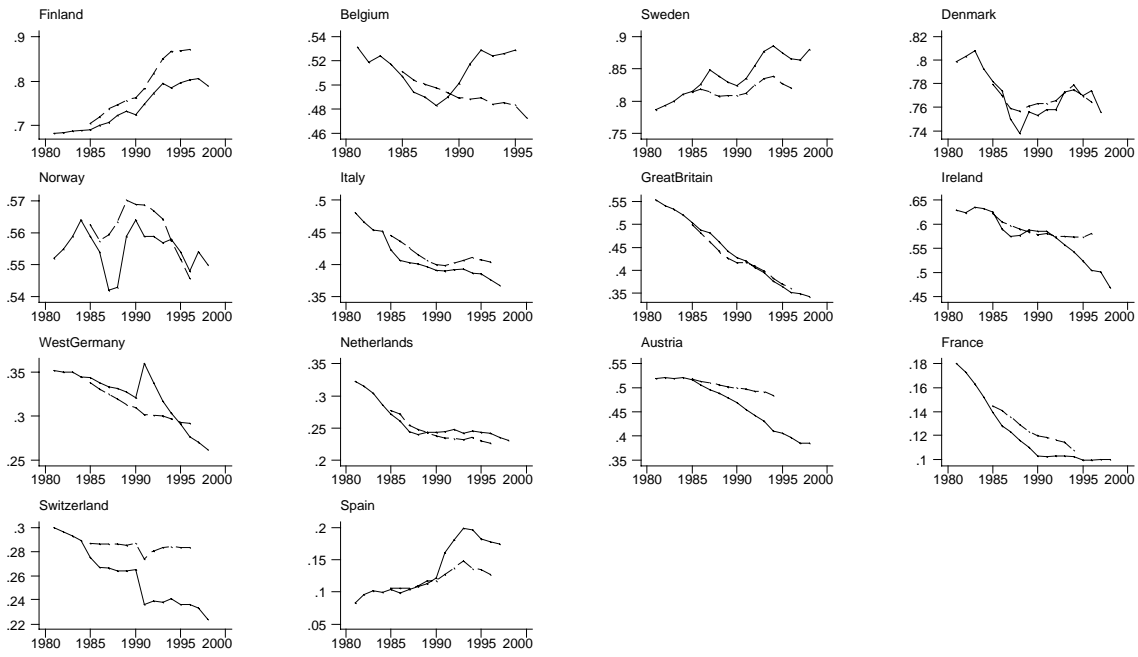


FIGURE 7

— union net density dependent

- - - - - predicted union density



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 in stead 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 using Ebbinghaus and Visser (2000).

The variable BENEFIT measures the replacement rate (i.e. the ratio between unemployment subsidy and average wage). 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-base 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 **WORKPLACE** is an index varying between 0 and 1 and indicates the extent of workplace presence of unions. Oskarsson (2001) provides basic information, that we 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, on a quinquennial base. See for data, methods and sources Visser (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).

Figure A.1 – variable DEN

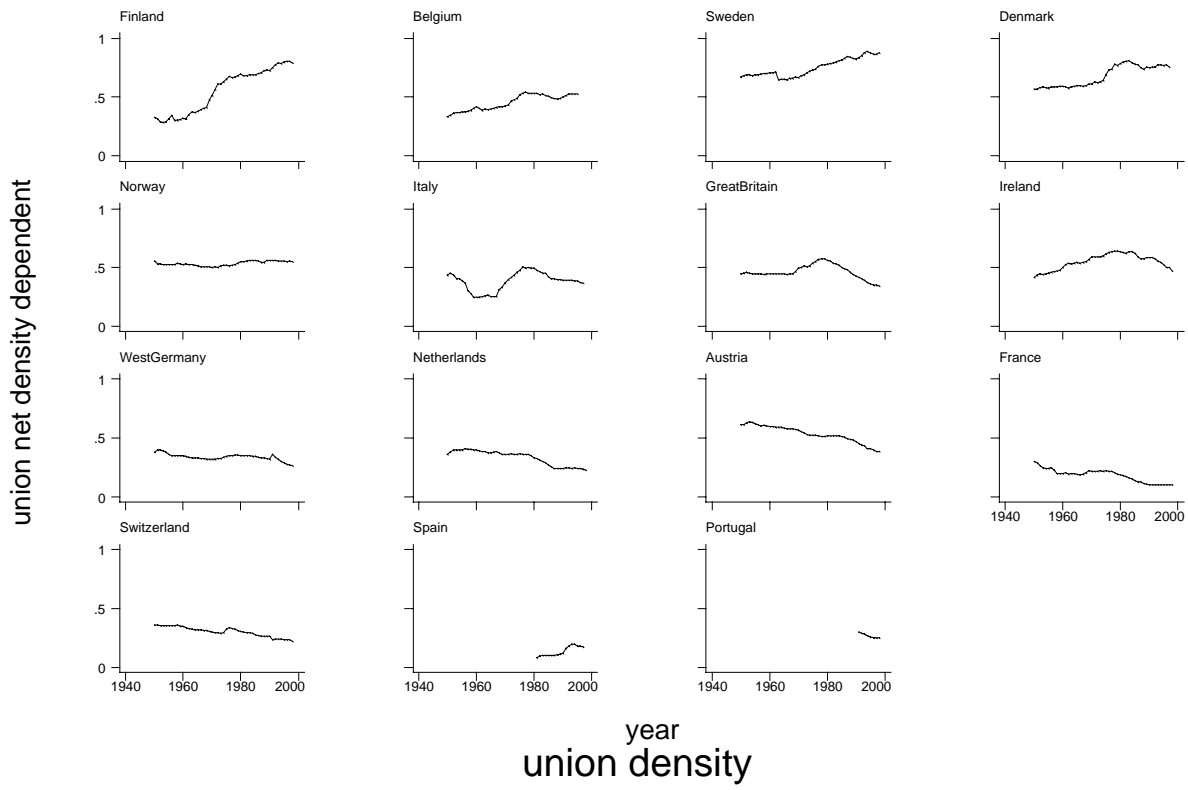


Figure A.2 – variable UNE

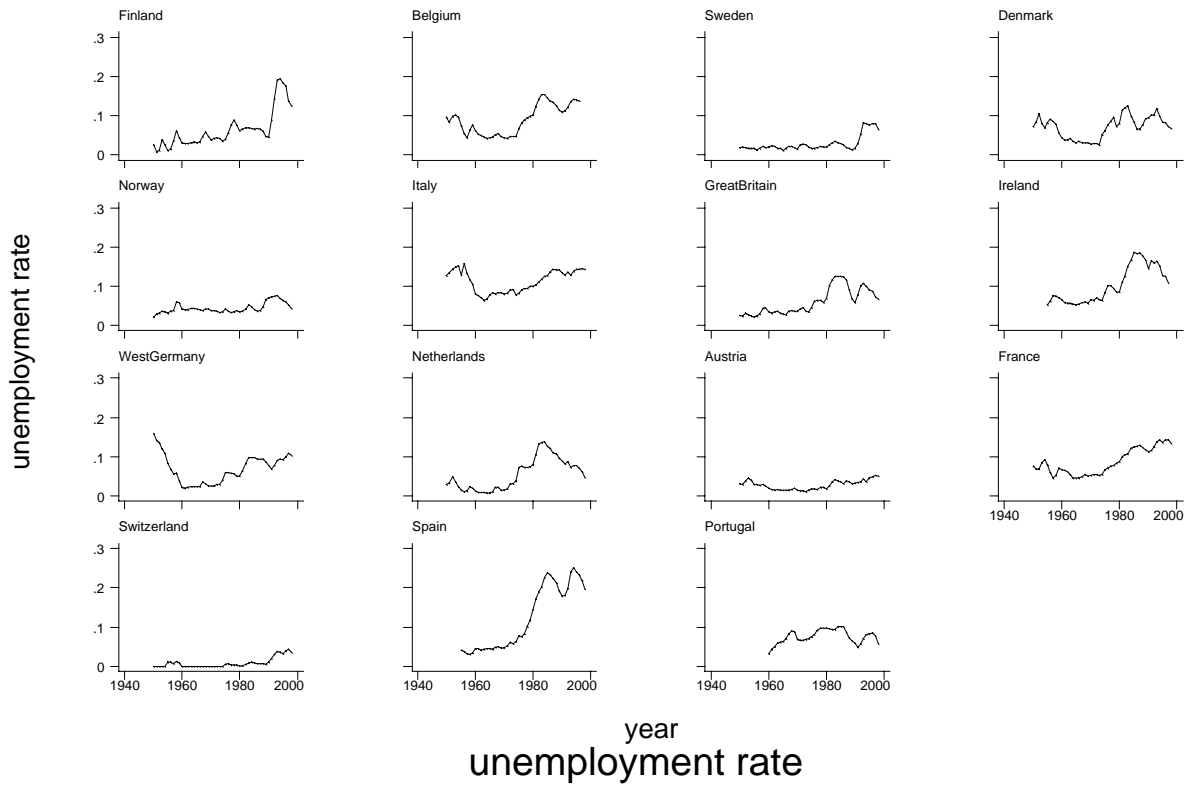


Figure A.3 – variable INFL

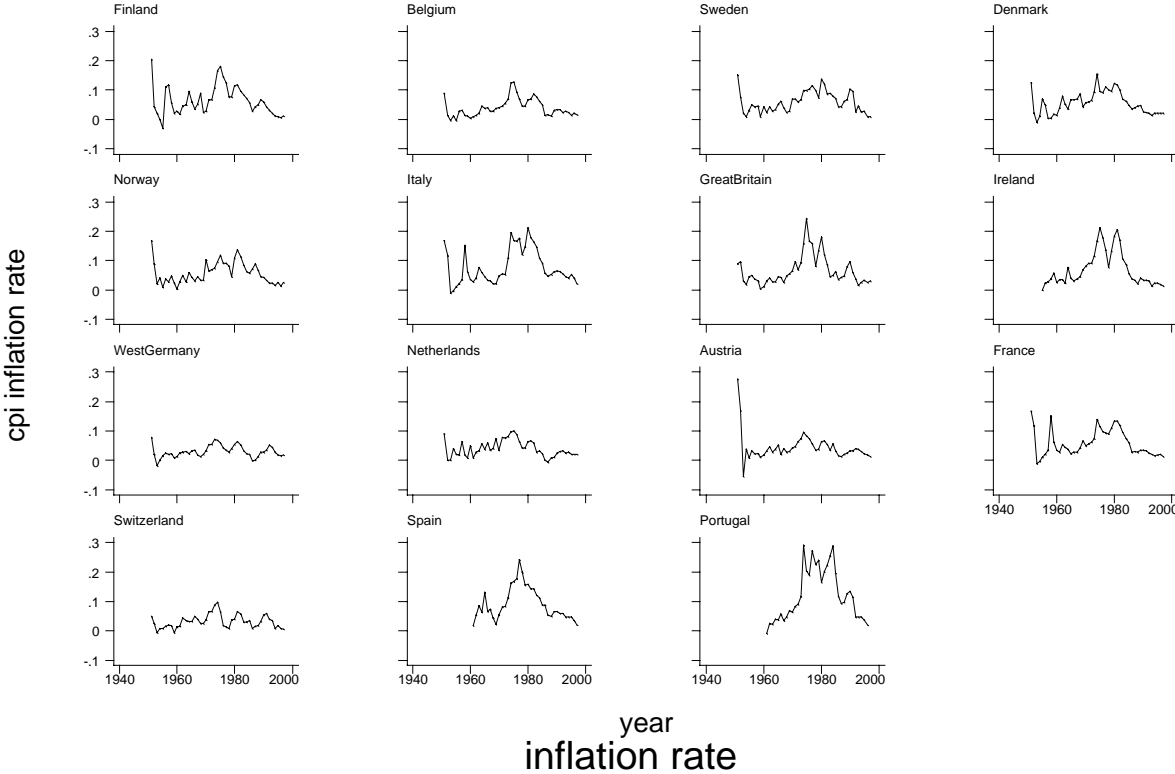


Figure A.4 – variable INDX

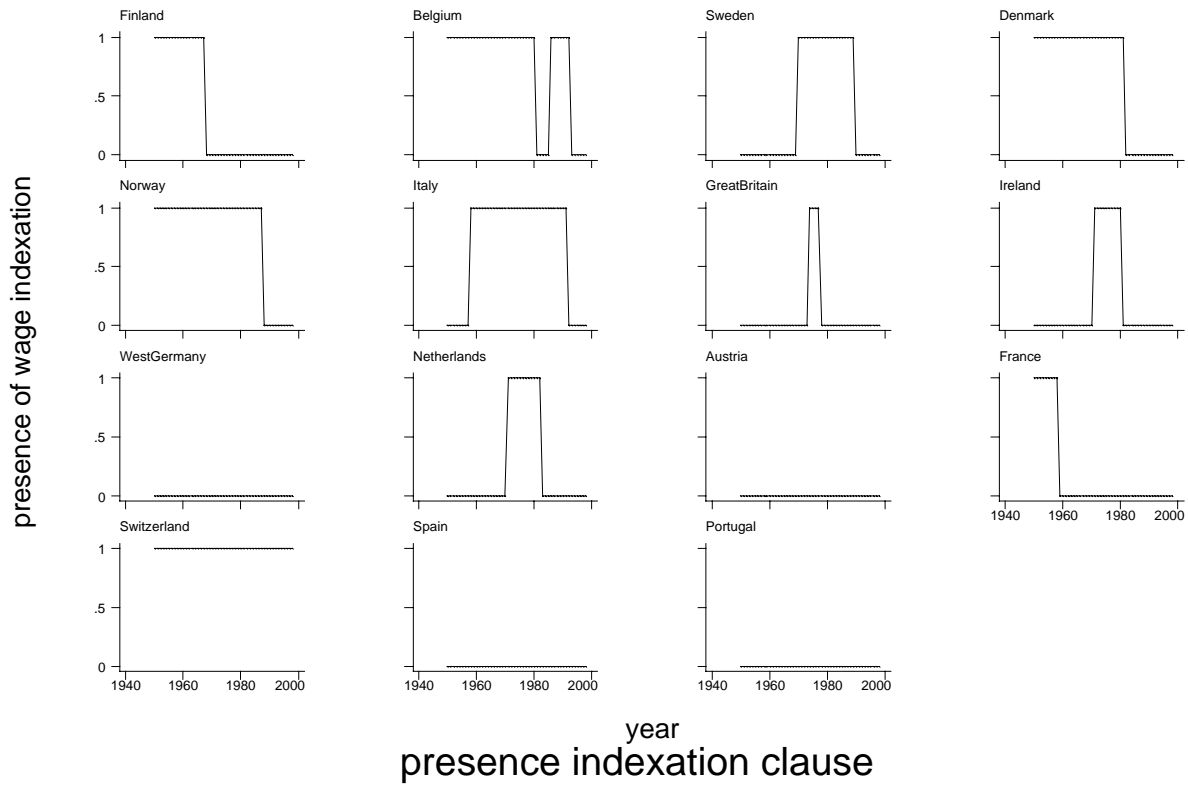


Figure A.5 – variable BENEFIT

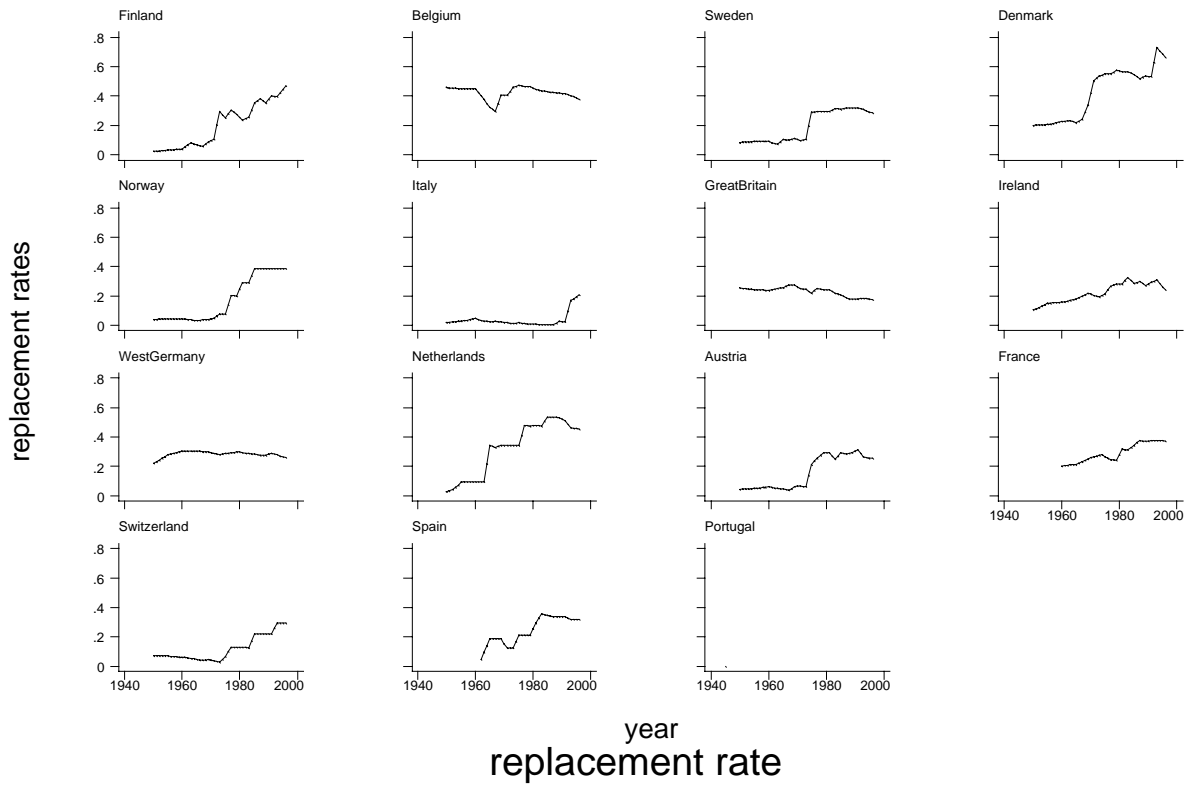


Figure A.6 – variable WORKPLACE

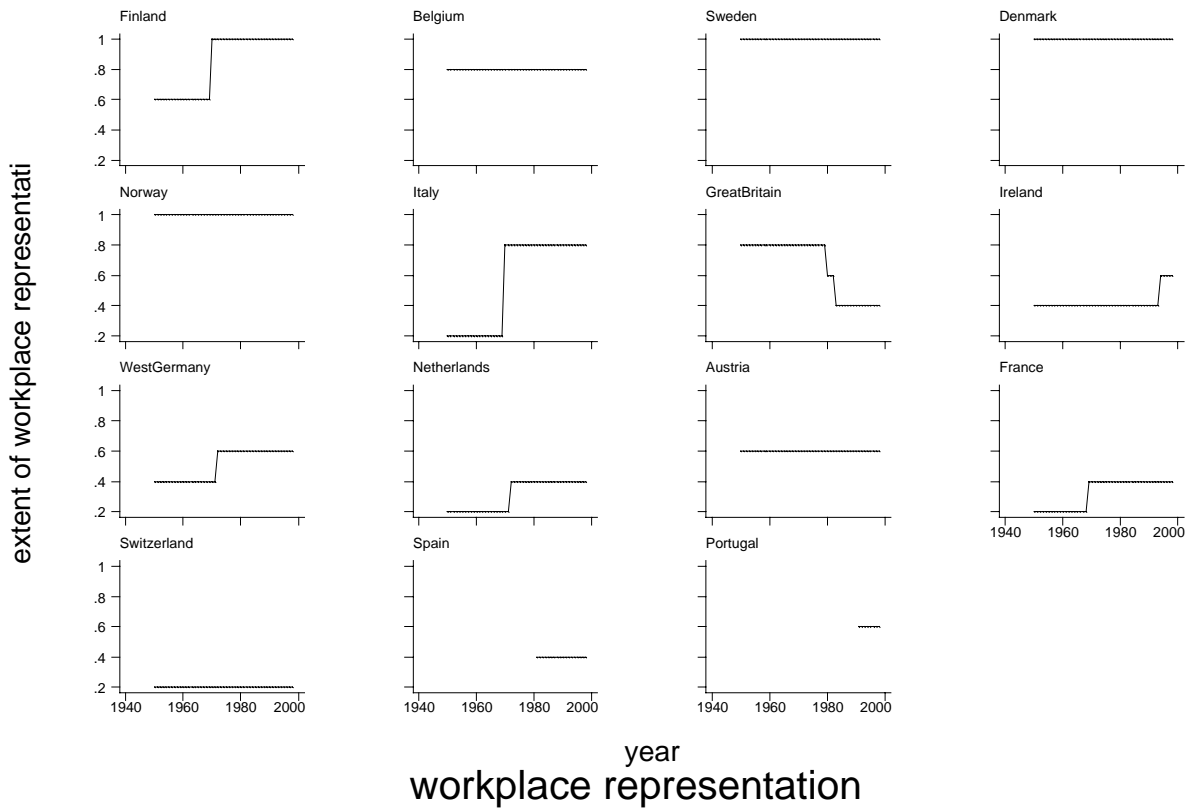


Figure A.7 – variable SPART

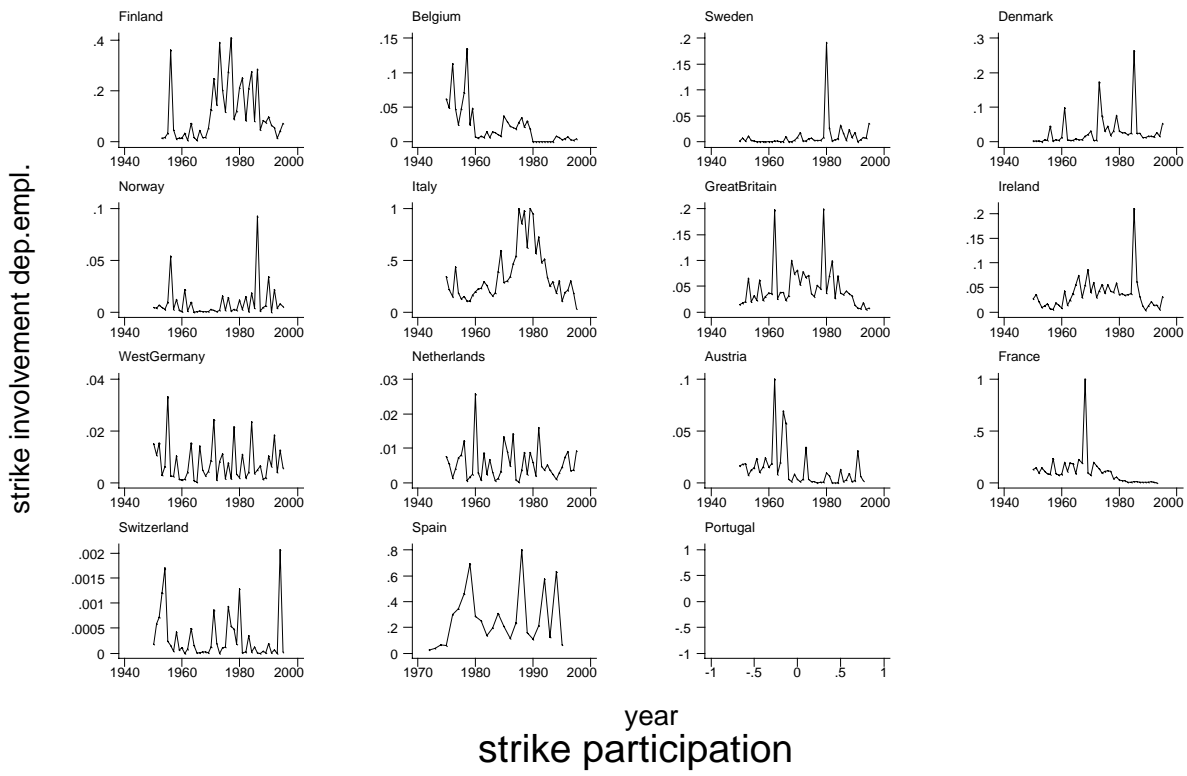


Figure A.8 – variable CENTR

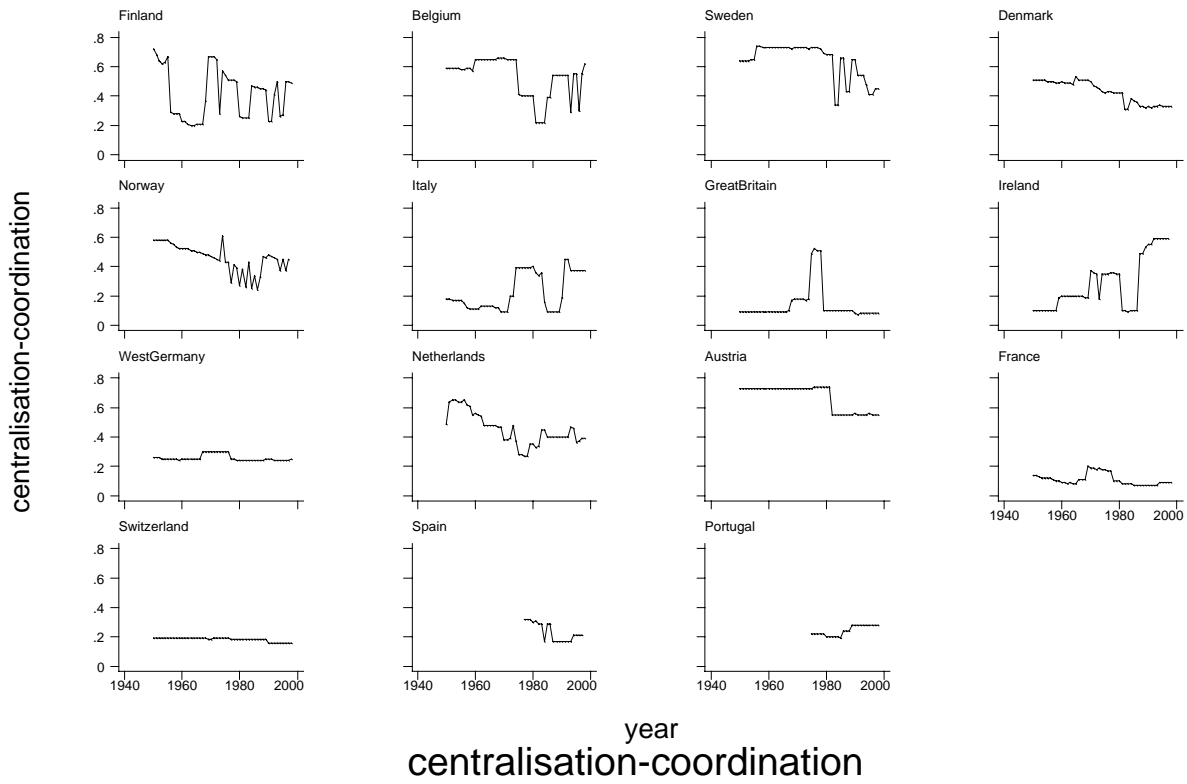


Figure A.9 – variable EMPL

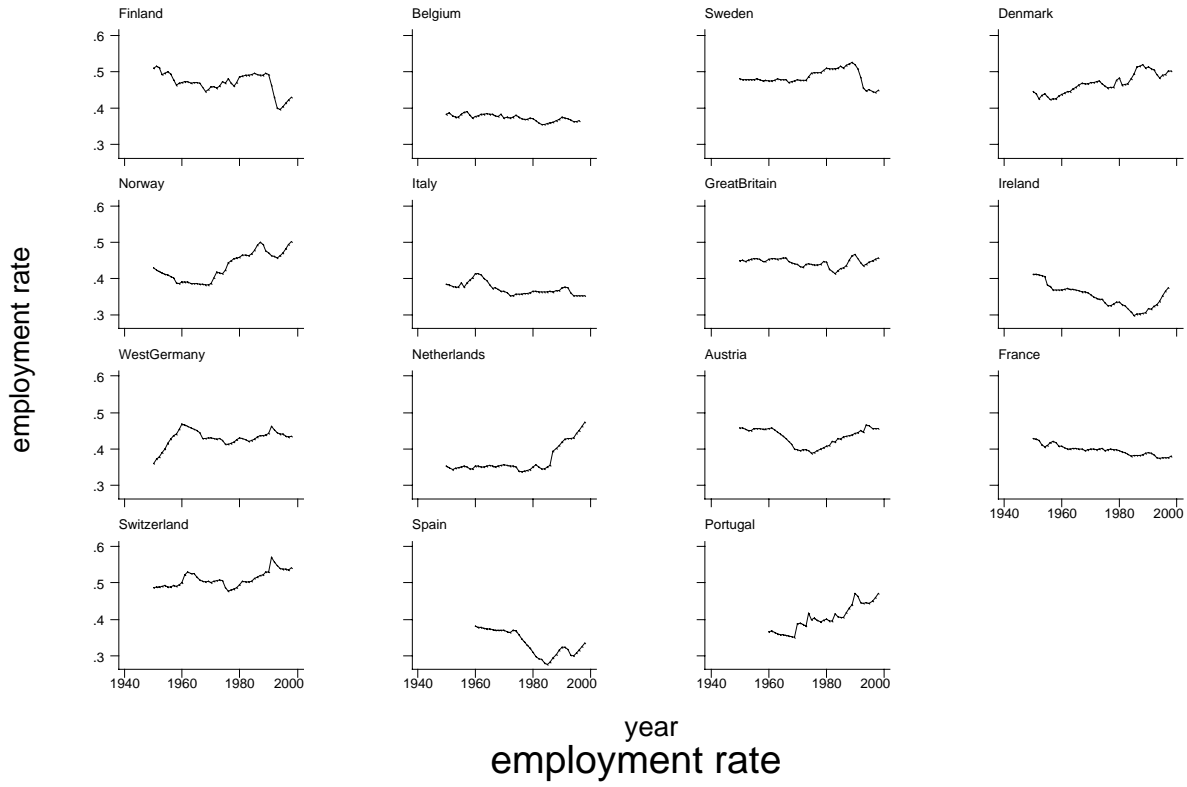


Figure A.10 – variable PA

