TRADE UNION MEMBERSHIP:

THEORIES AND EVIDENCE FOR ITALY[†]

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Abstract

We review economic theories of trade union membership that put forward the role played by social custom and strategic effects. We then analyse aggregate Italian data for the period 1951-1994. Cointegration analysis and the estimation of a short-run adjustment model provide some empirical support to both social custom and strategic effects as determinants of the long cycle that characterises Italian unionism in the post-war period. The results obtained for other European countries (Germany, Great Britain and Finland) are then compared with what we have obtained.

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1. Introduction

The behaviour of the labour market in developed economies is largely affected by trade unions in their role as representatives of the workforce in collective negotiations with employers or the government. The ability of trade unions to influence the conditions of pay and work in the labour market depends to a great extent on the degree of unionisation of the workforce, i.e. on the fraction of the workforce that has formally joined the trade union. On the one hand, trade unions derive the legitimisation to represent the interests of the workforce from a high degree of union density. Vanishing membership rates may lead a trade union to be excluded from the bargaining table. On the other hand, a large degree of unionisation enhances the bargaining power of the trade union, and thereby enables it to raise the pay, to better the working conditions and, more generally, to shift the labour market equilibrium away from the competitive outcome. The study of union membership is therefore an important step toward a better understanding of how labour markets work.

From an economic point of view, the fundamental puzzle to be explained by a theory of union membership is how the trade union manages to solve the free-riding problem which is inherent to the individual decision to join the union. The decision is individually costly, while its benefits are public. In situations of this kind individual rationality is not sufficient for collective rationality [Olson (1965)], and collective action, in form of union formation, would fail to occur by standard economic reasoning. This counterfactual statement has led economists to formulate theories of trade union membership that incorporate elements from other social sciences. Most models of union membership are eclectic in using neoclassical tools and game-theoretical concepts together with notions that are directly borrowed from sociology and psychology. Indeed, this literature offers a nice example of how distinct methodological approaches can successfully be combined in order to explain real-world phenomena.

The current paper is subdivided into two parts. In its first part we deal with the problem that a blend of different approaches may make it difficult to appreciate the consistency of the various arguments. Hence, in the first part of the paper we offer an overview of the main ingredients put forward by various models of union membership and try to organise them in a systematic view.

In the second part we present some evidence on the evolution of trade union membership in Italy, and propose a test of the theory. Our empirical investigation is based on aggregate socio-economic data for Italy during the period 1951-1994. We use Johansen's cointegration procedure in order to investigate the possible existence of long-run relationship between union membership, social custom variables and strategic variables. We also estimate a short-run VAR model, finding some evidence of the above mentioned effects. Finally, we compare our findings with previous attempts to test theoretical models of union membership.

2. Theoretical Insights

2.1 Social custom theory

Although the main role of unions is to bargain the wage with the employer, becoming a union member is not necessary in order to enjoy the right to be covered by the wage contract negotiated by the union. If one disregards the closed shop - an institution that has almost disappeared - union members who work in a given firm or sector are covered by the same collective contract as non-members. So, if workers get the same wage, independently of their union status, and some of them choose to pay a membership fee, what does the membership card buy?

The basic answer delivered by the literature is that membership buys the worker a good social treatment in the community he lives in or, in other words, a good reputation [Booth (1985), Booth and Chatterji (1993), Naylor and Cripps (1993), Corneo (1997), Goerke (1997)].

As there exists no formal obligation for the union to provide its members with social rewards, union membership gives rise to an implicit contract. The working of an implicit contract based on social rewards may be understood by making reference to the theory of social norms, as developed e.g. by the US-sociologist Coleman (1990). In economic terms, social norms are claimed to arise in order to solve problems caused by externalities and public goods. Interpersonal exchange of deference, sympathy, courtesy, and concrete help is a device that serves to award those individuals who hold a norm. To join the union may be considered as the focal action at which is directed a social norm. The norm is aimed at deterring the workers from free-riding on the bargaining effort provided by the trade union, and it is enforced by social sanctions and rewards mainly carried out by workmates. From the viewpoint of workmates, the decision to join the union is a positive externality or a contribution to a public good, as all workers benefit from a larger, and hence more powerful, trade union. By rewarding union members and sanctioning non-members in their social life, the workforce as a whole provides an incentive to join the union, and thereby it solves the free-rider problem.

According to this view, the degree of unionisation depends on the enforceability of a unionist social norm in the workers' community. In turn, community enforcement requires the willingness of workers to condition their personal attitudes toward workmates on their union membership status. Since rewarding or punishing someone implies a deviation from normal behaviour, both rewarding and punishing involve some costs for the subject who undertakes them. This creates a new problem: Why should workers choose to punish non-members and reward members?

This issue can be approached in various ways. A first route considers the role of second-order sanctions and sanctions of higher order, e.g. the fact that not only are deviators from the desired behaviour punished, but a worker who fails to punish is in turn punished. The sustainability of such sanctions can be evaluated using game-theoretical tools. Consider, for the sake of concreteness, the following game. In its first stage the workers of a given firm

simultaneously choose whether to join the trade union. Then, they engage in infinitely repeated interactions. In each stage, workers are randomly matched into pairs to play a version of the prisoner's dilemma game [Kandori (1992)]. Under complete information, a modified Folk Theorem applies to the subgame identified by the repeated random matching game. Therefore, it may be possible to sustain a perfect equilibrium in the matching game in which players only cooperate in the stage game if both are union members. If the discounted expected differential payoff between members and non-members in the matching game is sufficiently large, the overall game may well exhibit perfect equilibria in which the workers join the union in the first stage of the game.

Things, however, change if workers cannot observe each other's behaviour, e.g. they do not know whether a union member has failed to play "cooperate" with another member in the previous stage. In these cases it may be difficult to enforce the unionist norm. In general, such a norm is more likely to be enforced as a sequential equilibrium whenever workers have a large amount of information about individual behaviour in the past, and they use this information so that only defectors are punished. Clearly, such an information processing is facilitated by the presence of a stable social network linking the workers.

A second route draws from social psychology in order to identify behavioural rules that may explain the sanctioning of non-members in the social sphere. According to equity theory [Adams (1963)], in social exchange between two agents the ratio of the perceived value of the "inputs" to the perceived value of the "outcomes" would tend to be equal. In the current setting the "input" of a worker is the value of the deference shown to his workmate, and the "outcome" is the sum of the deference received by the other and the wage net of the membership fee. Behaviour according to equity theory would therefore lead to offset the higher net wage of a non-member by showing him less deference [Holländer (1990)]. More generally, workers may be endowed with a total amount of deference that they can show, and societal values may deliver criteria according to which deference should be allocated to others. Solidarity being a societal value, union members may automatically be awarded more deference by the workforce [Corneo (1997)].[1]

A third route contemplates the psychological mechanisms that may reduce the costs of sanctioning non-members in the social sphere. A prominent mechanism is based on cognitive dissonance reactions [Aronson (1979)]. These reactions usually stem from peoples' view of themselves as "nice people". Information that conflicts with this image tends to be ignored or accommodated by changes in other beliefs. Experiments show that individuals who are told to engage in cruel behaviour toward others systematically change their attitudes against the object of their cruelty. In order to preserve their self-image as a nice person, individuals lower their opinion about the object of their cruelty. A similar mechanism may operate when non-members are sanctioned. Cognitive dissonance theory suggests that individuals who badly treat non-members may want to believe that they still behaved as nice persons are supposed to.

Collective images of non-members as "scabs" and nasty individuals facilitate such beliefs and reduce the psychic cost of being cruel to them.

2.2 Strategic effects

The ability of trade unions to increase the surplus share that goes to the employees depends to a great extent on the degree of unionisation of the workforce. On the one hand, trade unions derive the legitimisation to represent the interests of the workforce at the bargaining table from a large union density. On the other hand, a large degree of unionisation enhances the bargaining power of the trade union. It follows that both the management and the union officials may wish to affect the union density, so as to increase their share in the distribution of surplus. The real issue is how these actors manage to interfere with the free membership decisions of workers.

A first area of intervention consists of providing private goods to the employees contingent on their union status. The trade union can offer exclusive services to their members, e.g. in the form of advice on retirement plans and legal support in disputes with employers [Booth and Chatterji (1995)]. To the extent that the union is able to offer services of better quality or at a lower price than a market provider is, this may generate additional incentives to join the union.[2] Symmetrically, the management may offer workers promotion opportunities inside the firm, which are only available to non-members [Corneo (1995)]. Alternatively, it may support a "domesticated" union, which in turn provides its members with various fringe benefits. In some cases, management campaign tactics may even include the firing of union activists [Freeman (1986)].

A second set of strategies that are available to the management and the union deals with the conditions for the enforcement of a social norm of union membership. As argued above, such a norm can be sustained if workers are linked to each other by a stable social network that carries the sanctions to the deviators from the unionist norm as well as the rewards to those who hold the norm. Both the management and the union can affect the efficacy of the social network as a norm-enforcing device. The management can especially organise the work process so as to discourage social contacts among workers, e.g. through disintegration of the various stages of the work process, outsourcing, delocation of production activities, homework, and higher personnel turnover across the firm's plants and offices. The union can encourage social contacts among workers in various ways, e.g. through the organisation of joint recreational activities for the employees and by negotiating working-time conditions that increase the amount of leisure that workers can enjoy together.

The third type of weapon used by union officials as well as the management is propaganda, in forms of in-plant and public meetings, leaflets, posters, and so on [Naylor and Raaum (1993)]. The efficacy of propaganda might be explained using arguments from cognitive dissonance theory. Union members may wish to believe that their union status will really secure them

higher social esteem and a better treatment by workmates. Unionist propaganda may facilitate such beliefs, thereby fostering union membership.

Finally, unions and management can lobby the government so as to obtain industrial relations legislation that makes their campaign tactics more easy to carry out [Freeman and Pelletier (1990)]. Laws regulating union recognition, liabilities for industrial action, and coverage of union wages are likely to have a major impact on the ability of unions and management to influence the degree of unionisation. Rules about the degree of centralisation in wage bargaining and the ownership form of firms also affect the incentives to undertake organisation campaigns [Corneo (1995)].

2.3 Implications

The theoretical insights discussed above allow one to identify some exogenous sources of variation that may help predicting changes in the degree of unionisation. The *social custom* theory stresses the role of factors that affect the extent to which a unionist norm is enforceable. A prominent factor is *ideology*, i.e. the prevailing view about what defines just behaviour. Trade unionism as an ideology favours membership because it enhances the social esteem of union members and lowers the psychic cost of punishing non-members. While ideology is to some extent influenced by union behaviour, it undeniably has a strong component that may safely be seen as outside the control of union officials as well as the management. A second factor affecting the enforceability of the unionist norm is the *density and durability of workmates' interactions* in the social sphere. As argued above, the social network linking workers with each other carries the information and the sanctions that can sustain the norm. Again, the social network is partially endogenous to the strategies of the management and the union officials. By way of an example, the management can organise the work process so as to isolate the workers from each other. However, work organisation is largely determined by long-run trends concerning structural and technological development, which can be treated as exogenous.

The *strategic* dimension of the union membership issue stresses that the management and the union officials can affect union membership through costly investments in organisation campaigns. In turn the investment decisions depend on the *marginal benefits* and *costs* of the available strategies. The benefit from investing depends on the *surplus* that is to be divided between the firm and its employees. The larger the surplus, the higher the return to influencing union membership, because this alters the parties' bargaining power. If only the union officials invest in membership campaigns, an increase in the available surplus is expected to induce a higher investment by them and thus a higher union density. The reverse is expected if only the management invests. The cost of investing in organisation campaigns is affected by industrial relations legislation and by the ability of employers and different unions to coordinate. Anti-union legislation lowers the marginal cost of management opposition, and thereby decreases

union density. A more centralised bargaining structure weakens the incentive for the individual firm to engage in management opposition against unionisation. Hence a more unified union movement can more easily promote membership. Again, these factors may not always be considered exogenous.

3. Evidence for Italy

3.1 Preliminary description

In Italian labour markets closed-shop arrangements are virtually non-existent, and the individual decision to join a union is a completely voluntary one. The unions do not run the unemployment insurance, as for example in Denmark, nor they offer a number of private incentive goods to their members, as in Britain [OECD (1991)]. In Italy collective bargains are typically struck both at sectoral and firm level, and they cover *de facto* all employees, independently of their union status. Union coverage in the overall economy is very high.[3]

Italian industrial relations are characterised by the presence of three large union confederations that represent the bulk of trade union membership in the country. While each confederation has a marked identity, a great deal of cooperation among the confederations usually occurs. This is especially the case when the trade unions negotiate over social policy issues with the government [Romagnoli (1980), Accornero (1992)].

In the post-war period, the evolution of the Italian union density of employed workers displays a long cycle of about 30 years, with two peaks, one immediately after the world war, and one in 1976 (see Figure 1). During the whole period, union members in all sectors have mostly accounted for 30 to 50 per cent of all employees. A similar percentage and a similar evolution are typical for both the manufacturing and the service sector. This pattern is by no means representative of the evolution of unionism in developed economies [Blanchflower and Freeman (1992)]. The long cycle of Italian unions sets them apart both from the experience of the Nordic countries, where union membership almost steadily rose in the same period, and from the declining unionism of countries like the US and France [Golden and Wallerstein (1995)]. The evolution after 1970 is similar to that of the UK, which, however, is characterised by a very different institutional setup [Freeman and Pelletier (1990)].

[insert figure 1 around here]

The data to which we refer in the sequel are those of the two biggest confederations, CGIL and CISL, that constitute about 4/5 of overall Italian union density. Especially at their very beginning, these large confederations differentiated according to ideological divides, referring to socialist ideology the former and to catholic ideals the latter; nowadays these distinctions are more blurred, but different strategies prevent their unification.

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We use aggregate annual data of union membership in CGIL and CISL for the period 1951-1994.[4] We only consider members who were active workers, thus excluding retirees. This occurs for two reasons: retirees do not obtain a direct benefit from wage bargaining nor suffer income losses from strike activity; and they hardly exert some control on union activity.[5] The union density is obtained by dividing the number of members by total dependent employment (thus including in potential membership people employed in small enterprises).[6]

3.2 Variable Selection

Given the absence of a well-established tradition in estimating structural models of union membership, we follow a VAR approach. Because of the small number of degrees of freedom (44 yearly observations), our variable selection procedure has to be rather parsimonious. The theoretical models surveyed above put forward two sources of variation affecting union membership: the social custom and the strategic effect.

Empirical variables in the first category include solidaristic ideology and measures of workers' social interactions, since these factors foster the social esteem of union members and increase the feasibility of sanctions within the workforce. While the grasp of solidaristic ideology in a society is hard to measure, we expect it to be reflected by electoral behaviour. As long as socialist ideas are a close substitute for solidaristic values, our first measure of the social custom effect is offered by the percentage of votes obtained in general elections for the Parliament by the political parties that are traditionally associated with the Left (variable LEFT).[7],[8]

In order to capture the enforceability of unionisation, we consider empirical measures of work division and work organisation. While one has detailed measures of workers' interaction at the plant level, it is not easy to obtain corresponding aggregate measures. We have experimented with the sectoral composition of employment as a proxy for it. Arguably, work organisation in industry induced greater interaction among workers than in the service sector, especially during the Fordist phase in the 60's and the 70's when the assembly-line was the prevailing way to produce in the industry sector. Therefore our second measure for the social custom effect is the size of dependent employment in the manufacturing sector divided by total dependent employment (variable INDUSTRY), as a proxy of greater workers' interaction.[9]

The second group of variables refers to the benefits and costs for both union officials and the management to manipulate union membership. Theoretical models suggest to measure the escompted benefit by the available surplus that is to be divided between workers and capitalists, as the available surplus determines the incentive to invest resources in order to alter the relative bargaining power. Hence, our first measure for the strategic effect is given by the difference between labour productivity and the reservation wage. We have measured labour productivity by the average value added per capita (including both dependent and self-employed workers) in the private sector at constant prices. In the absence of a true benefit

system for the unemployed in Italy,[10] we have measured the reservation wage by the average gross wage in non-unionised sectors (agriculture, retailing, personal services) deflated by the consumer price index and multiplied by the employment rate (thus obtaining the variable SURPLUS).

Another factor affecting the incentives to oppose the unionisation process is the degree of centralisation of the bargaining structure: a more centralised bargaining favours unionisation via lower incentives for opposition at the firm level. Unfortunately, we do not have good proxies for temporal variations of centralisation. Our candidate for this effect is provided by an imperfect measure of the degree of financial centralisation of the trade union: the share of the face value cost of the union membership card going to the national level of trade unions (variable CENTR).[11]

A third element that we can measure is the role of the public sector in preventing anti-union campaigns and thereby fostering aggregate union density. We have thus taken the share of workers working in the public administration (variable PUADM) into account.

Finally, pro-labour legislation raises the cost of anti-union activity by the management, and may therefore induce a positive effect on the union density. In Italy the most important legislative act in this area is the "Statuto dei Lavoratori" (Workers' charter of rights), which was introduced in 1970. It dramatically enlarged work council powers and strongly protected union activity. In our empirical analysis this is represented by the variable STAT, a step variable that takes value 1 after 1970. Table 1 reports descriptive statistics; Figure 2 plots the main variables. Data sources are reported in the Appendix.

Table 1 - Variables description

Variable name	Description	Mean	Std Dev	Minimum	Maximum
UNION	Membership (total)	36.07	6.91	27.57	54.00
CGIL	Membership (CGIL only)	22.42	6.42	16.42	41.82
CISL	Membership (CISL only)	13.64	2.51	9.84	18.40
social custom variables					
LEFT	Votes to the Left	27.59	4.93	14.79	36.00
INDUSTRY	Industrial employment share	44.59	4.30	36.88	49.82
strategic effect variables					
SURPLUS	Available surplus	11.62	5.49	3.16	22.39
CENTR	Centralisation of union resources	64.98	7.30	50.00	82.00
PUADM	Public employment share	19.28	3.54	14.59	24.24
additional variables considered in the alternative model					
STRIKE	Strike participation	22.13	15.10	3.74	60.81
WAGE	Gross wage	11.97	5.18	4.32	18.79
MALE	Male component in labour force	70.11	3.93	62.59	74.30

Variable legend:

UNION = ratio of union members (CGIL+CISL only), who are still active workers, and total dependent employment

LEFT = percentage of votes obtained in general elections for the Parliament (Camera dei Deputati) by the parties traditionally classified with the Left (communist and minor leftist groups)

INDUSTRY = ratio of dependent employment (man-hours) in industry to total dependent employment

SURPLUS = (real) *productivity of private sector* (i.e. value added per capita - including self-employed - 1985 prices) minus (real) *alternative wage* (average gross income per worker in residual sectors - agriculture, retailing, personal services - deflated with consumer price index and weighed with the employment rate)

CENTR = share of the (face value) cost of the union membership card going to the national level of trade unions.

PUADM = ratio of dependent employment (jobs) in public services to total dependent employment

STAT = step variable (1 after 1970) corresponding to the introduction of a labour charter easing workers' representation in workplaces with more than 15 employees (*Statuto dei Lavoratori*).

STRIKE = ratio of strikers (number of workers on strike due to labour conflict - yearly averages) to total dependent employment

WAGE = yearly average gross income per employee (private sector), deflated with the 1985 consumer price index

MALE = ratio of male in labour force to total labour force

[insert figure 2 around here]

3.3 Cointegration analysis

After selecting the variables to be analysed, we could either estimate a structural model (possibly including autocorrection errors) or proceed with less theoretical priors, using the VAR methodology in order to let the data speak for us. Given the limited previous evidence of structural estimation, we followed the latter approach. Our basic empirical model is the following vector autoregression:

$$\Delta \mathbf{X}_t = \mu + \Gamma_1 \Delta \mathbf{X}_{t-1} + \Pi \mathbf{X}_{t-1} + B_1 STAT_t + \varepsilon_t \qquad (1)$$

where $\mathbf{X}$ is a vector that includes UNION, LEFT, INDUSTRY, SURPLUS, CENTR, PUADM, *trend*; *trend* is a linear trend, μ is a vector of constants, and $\varepsilon \approx N(0, \Sigma)$. In this specification, we assume that labour legislation (STAT) is weakly exogenous to the vector $\mathbf{X}$ and influence only its short-term dynamics.[12] Notice that the matrix Π incorporates all the relevant information on the long-run relations among the variables included in $\mathbf{X}$. If the rank r of this matrix lies between 0 and n, where n is the number of variables in the vector $\mathbf{X}$, there are r cointegrating vectors and the data can be described by an error correction model.

We have started from a specification with 4 lags in each variable and used sequential simplification to reduce the number of lags to 1.[13] The existence of cointegration relationships involving the variables included in the vector $\mathbf{X}$ is tested using the trace test proposed by Johansen:

$$\eta_r = -T \sum_{i=r+1}^{n} \log(1 - \lambda_i) \qquad (2)$$

where r is the number of cointegration vectors, T the number of observations (43), and λ_i are the (estimated) eigenvalues of the Π matrix, ordered in a descending order.[14] The results of the test are reported in table 2 and show that we cannot reject the hypothesis that there are at least two cointegration vectors in the data.[15]

Table 2 - Cointegration analysis: 1952 to 1994

Eigenvalue λ_i	log-likelihood	rank	Ho:rank=p	η_r	95%
	-32.3941	0	p = 0	161.5**	114.9
0.7206192	-4.97777	1	p ≤ 1	106.7**	87.3
0.6148714	15.5371	2	p ≤ 2	65.66*	63.0
0.4561023	28.6304	3	p ≤ 3	39.47	42.4
0.3700505	38.5659	4	p ≤ 4	19.6	25.3
0.2159132	43.7955	5	p ≤ 5	9.145	12.2
0.1915725	48.3678	6			

If we interpret the cointegrating vectors as long-run relationships among the variables under study, the non-uniqueness of these relationships is disturbing. Moreover, linear combinations of cointegrating vectors themselves form cointegrating combinations. When the rank of the Π matrix is greater than one (say r), it is always possible to decompose it as $\Pi = \alpha\beta'$, where α is a $(6 \times r)$ matrix of loading factors and β' is a $(r \times 6)$ matrix of eigenvectors.

We now use some considerations from the theory in order to impose and test a set of restrictions on α and β. Table 3 below reports both the unrestricted and the restricted matrix of loading factors and eigenvectors. Notice that the data accept the restriction that sets all social custom variables equal to zero in the long-run cointegration equation. The restriction that all strategic effect variables be zero is however rejected by the data (Chi²(8) = 28.605 [p-value 0.0004**]).

Table 3 - Cointegrating vectors

unrestricted

	loading factors		Eigenvectors	
	α_1	α_2	β_1	β_2
UNION	-0.089	0.280	1.000	-0.103
LEFT	-0.042	0.194	0.000	-0.446
INDUSTRY	-0.017	-0.104	-3.425	1.000
SURPLUS	0.004	0.061	-12.59	-2.176
CENTR	0.135	0.304	-1.475	0.020
PUADM	-0.001	0.065	-4.079	1.852
Trend	--	--	5.922	0.791

restricted

	loading factors		eigenvectors	
	α_1	α_2	β_1	β_2
UNION	-0.134 (0.02)	0.565 (0.08)	1.000	0.000
LEFT	0.000	0.000	0.000	1.000
INDUSTRY	-0.021 (0.005)	-0.080 (0.03)	0.000	-2.621 (0.24)
SURPLUS	0.000	0.051 (0.03)	-13.98 (1.86)	5.664 (1.30)
CENTR	0.201 (0.08)	0.000	-1.11 (0.13)	0.000
PUADM	0.000	0.077 (0.02)	0.000	-3.226 (0.98)
Trend	--	--	6.59 (0.77)	-2.557 (0.61)

loglik = 12.391 unrloglik = 15.537
LR-test, rank=2: Chi²(8) = 6.291 [p-value 0.6146]

standard errors in parenthesis

restricted long-run matrix $\Pi = \alpha\beta'$, *rank 2*

	UNION	LEFT	INDUSTRY	SURPLUS	CENTR	PUADM	Trend
UNION	-0.134	-0.215	0.565	0.654	0.148	0.695	-0.333
LEFT	0.000	0.000	0.000	0.000	0.000	0.000	0.000
INDUSTRY	-0.021	0.030	-0.080	0.470	0.023	-0.099	-0.218
SURPLUS	0.000	-0.019	0.051	-0.112	0.000	0.063	0.050
CENTR	0.201	0.000	0.000	-2.821	-0.224	0.000	1.331
PUADM	0.000	-0.029	0.077	-0.168	0.000	0.095	0.075

Our results indicate that the data generating process underlying these variables exhibits two long-run relationships:

$$\text{UNION} = 13.98 \cdot \text{SURPLUS} + 1.11 \cdot \text{CENTR} - 6.59 \cdot \text{TREND} \tag{3}$$

$$\text{LEFT} = 2.618 \cdot \text{INDUSTRY} - 5.65 \cdot \text{SURPLUS} + 3.22 \cdot \text{PUADM} + 2.55 \cdot \text{TREND} \tag{4}$$

Equation (3) indicates that union membership is not affected by social custom factors (the data accept the exclusion of both LEFT and INDUSTRY from the first vector), whereas strategic

factors turn out to be empirically relevant. The positive sign of SURPLUS suggests that the strategic incentives are more relevant for the union officials than for the management. As expected, centralisation weakens the incentive for the management to oppose unionisation. Equation (4) suggests that left voting is more likely when industrial and public employment are high. If the harshness of the social conflict is inversely related to the available surplus, then left voting occurs more often during periods of intense conflict (i.e. low surplus).

3.4 An enlarged empirical model

We suspect that the bad performance of the social custom variables in the above cointegration analysis might be due to an unfortunate selection of potential regressors. We were strictly adherent to the theoretical predictions, and in so doing we might have neglected relevant sources of information. Hence, we now turn to a less theory-oriented variable selection procedure.

The first empirical variable that we introduce is the fraction of workers participating in strikes called for by the trade unions (variable STRIKE). While the adhesion to strikes may be fostered if union density is large, participating in strikes may also be seen as a proxy for social custom factors that push up trade union membership. The decision to join workmates in an industrial conflict or to participate in demonstrations for socio-political goals is prompted by a strong feeling for social justice. This feeling might be one and the same with the feeling that prompts a worker to become a member of the trade union.

The second variable that we introduce is the gender composition of employment (variable MALE). The way in which this variable might be related to the theoretical arguments is through the presence of gender-specific preferences. Men and women may have systematic differences in their preferences for reputation derived by union membership, women being expected to place a lower weight on it.[16]

Finally, we add the real wage (variable WAGE) to our vector. Theoretical models with income effects point out that the union wage and the union membership are jointly determined, which justifies the inclusion of this variable in the empirical analysis.[17]

In order to reduce the dimensionality of the underlying VAR we moved two variables (CENTR and PUADM) to short-run controls. We are then left with a seven variable vector **X** (UNION, LEFT, INDUSTRY, STRIKE, SURPLUS, WAGE, MALE, trend). Our enlarged empirical model is the following vector autoregression:

$$\Delta \mathbf{X}_t = \mu + \Gamma_1 \Delta \mathbf{X}_{t-1} + \Pi \mathbf{X}_{t-1} + B_1 \Delta CENTR_{t-1} + B_2 \Delta PUADM_{t-1} + B_3 STAT_t + \varepsilon_t \qquad (5)$$

In this specification it is assumed that bargaining centralisation (CENTR), public employment (PUADM) and labour legislation (STAT) are weakly exogenous and only affect the short-term dynamics. Here again we cannot reject the hypothesis that there are 2 cointegration vectors in

our data. The following table reports both the unrestricted and the restricted matrix of loading factors and eigenvectors associated with these two cointegrating relationships.

Table 4 - Cointegrating vectors - enlarged model

unrestricted

	loading factors		eigenvectors	
	α_1	α_2	β_1	β_2
UNION	-0.064	-0.025	1.000	1.803
LEFT	-0.022	0.015	0.3768	-3.058
INDUSTRY	-0.014	0.007	2.101	1.000
STRIKE	0.412	-0.052	-1.151	0.4192
SURPLUS	-0.008	-0.005	-9.481	9.949
WAGE	0.012	-0.001	8.489	1.091
MALE	-0.007	0.004	0.6776	-11.11
Trend	--	--	2.171	-6.054

restricted

	loading factors		eigenvectors	
	α_1	α_2	β_1	β_2
UNION	-0.129 (0.02)	0.000	1.000	0.000
LEFT	0.000	0.049 (0.01)	0.000	-3.41 (0.86)
INDUSTRY	0.000	0.017 (0.002)	0.000	0.000
STRIKE	0.000	0.000	-0.393 (0.08)	1.000
SURPLUS	0.015 (0.007)	0.000	-7.725 (1.62)	17.82 (4.18)
WAGE	-0.021 (0.003)	-0.005 (0.001)	0.000	0.000
MALE	0.000	0.009 (0.003)	0.000	-5.095 (1.55)
Trend			3.846 (0.67)	-8.556 (1.97)
loglik = 38.778 unrloglik = 44.584 LR-test, rank=2: Chi²(12) = 11.612 [p-value 0.4773]				

standard errors in parenthesis

restricted long-run matrix $\Pi = \alpha\beta'$, rank 2

	UNION	LEFT	INDUSTRY	STRIKE	SURPLUS	WAGE	MALE	Trend
UNION	-0.129	0.000	0.000	0.051	1.003	0.000	0.000	-0.499
LEFT	0.000	-0.170	0.000	0.049	0.890	0.000	-0.254	-0.427
INDUSTRY	0.000	-0.060	0.000	0.017	0.315	0.000	-0.090	-0.151
STRIKE	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SURPLUS	0.015	0.000	0.000	-0.006	-0.122	0.000	0.000	0.061
WAGE	-0.020	0.016	0.000	0.003	0.070	0.000	0.0253	-0.036
MALE	0.000	-0.031	0.000	0.009	0.165	0.000	-0.047	-0.079

The two long-run relationships of the enlarged model can be expressed as:

$$\text{UNION} = 0.393 \cdot \text{STRIKE} + 7.72 \cdot \text{SURPLUS} - 3.84 \cdot \text{TREND} \qquad (6)$$

$$\text{STRIKE} = 5.095 \cdot \text{MALE} + 3.41 \cdot \text{LEFT} - 17.82 \cdot \text{SURPLUS} + 8.55 \cdot \text{TREND} \qquad (7)$$

Equation (6) indicates that union membership is positively affected by strike participation and by the available surplus. Furthermore, membership exhibits a declining trend. Insofar as strike participation can be taken as a social custom factor, these results suggest that previous theoretical considerations find some support in the Italian experience. When compared to the previously obtained equation (3), one observes that the surplus maintains a significant impact, whereas ideology (represented by left voting) remains non significant. Only when ideology translates into strike participation, it makes unionisation easier.[18]

Equation (7) suggests that strike participation is related to gender composition and political behaviour: males are more inclined to go on strike, and strikers are more frequently found when the left-wing parties gain votes in the election. The negative impact of SURPLUS on strike activity might be explained as before by the harshness of the social conflict: when available resources are abundant, fighting is less likely because conflict composition is easier.[19]

Notice that both the share of employment in the industry and the real wage do not affect the long-run relationships. Strike participation is weakly exogenous to the process (i.e. is not affected in the long run by the other variables, as it is can easily be detected from the restricted long-run matrix). Figure 3 gives the overall picture of our results.

[insert figure 3 around here]

How do theoretical insights perform according to the current empirical model? As far as strategic factors are concerned, Italian union officials appear to behave strategically by engaging more actively in membership campaigns the greater is the available surplus. When included, the size of the public sector (variable PUADM) and bargaining centralisation (variable CENTR) play a positive role. The evidence about social custom factors is less clear-cut. We do not find evidence of direct effects from party ideology (as measured by the variable LEFT) or

work organisation (variable INDUSTRY). Only by the effects from strike participation we can find some evidence that social custom factors influence union density in the long run.

In order to check the robustness of our results we have replicated the same type of analysis considering membership rates for single confederations. The results about the restricted eigenvectors are reported in Table 5.

Table 5 - Cointegrating vectors for single confederations (1952-1994)

	CGIL loading factors		CISL loading factors	
	β_1	β_2	β_1	β_2
UNION	1.000	0.000	1.000	-7.314 (0.85)
INDUSTRY	0.000	0.000	0.000	0.000
MALE	4.41 (0.57)	-12.82 (0.57)	0.000	-4.83 (0.58)
LEFT	0.000	-1.16 (0.85)	0.000	0.000
STRIKE	-0.55 (0.07)	1.000	-0.047 (0.005)	1.000
WAGE	0.000	0.000	-0.824 (0.12)	0.000
SURPLUS	-12.14 (1.70)	24.69 (5.03)	0.525 (0.10)	0.000
Trend	6.81 (0.75)	-13.86 (2.33)	0.066 (0.67)	-1.363 (0.28)
LR-test rank=2	Chi²(12) = 11.123 [p-value 0.2674]		Chi²(12) = 15.2 [p-value 0.1735]	

standard errors in parenthesis

The decomposition by confederation supports the idea that CGIL (the socialist and communist union) membership is more ideologically determined: the variable STRIKE has a higher coefficient than in the CISL (the catholic union) membership equation; moreover, in the latter the variable LEFT can easily be restricted to zero. Strategic behaviour seems to be relevant for CGIL, but works in the opposite direction for CISL.

3.5 Short-run dynamics of the enlarged model

Using the cointegrating vectors obtained in the enlarged version, we estimate the full model, including the short-term dynamics, by using an error correction formulation, as implied by equation (5). The full-information maximum-likelihood estimates and the relevant diagnostics are reported in Table 6 for the most parsimonious model, obtained after a sequential simplification of each equation based upon the standard errors of the estimated coefficients.

Table 6 - Estimation of the VAR

Identity for $REC1 = UNION - 7.725 \cdot SURPL - 0.39399 \cdot STRIKE + 3.846 \cdot Trend$

Identity for $REC2 = STRIKE - 5.095 \cdot MALE + 17.82 \cdot SURPL - 3.41 \cdot LEFT - 8.556 \cdot Trend$

Estimation techniques: FIML - sample period: 1953-1994

Equation 1 for Δ(UNION)		$\sigma = 1.199$	
Variable	Coefficient	Std. Error	p-value
$\Delta(STRIKE)_{-1}$	0.018	0.014	0.220
$\Delta(LEFT)_{-1}$	-0.182	0.088	0.047
$\Delta(MALE)_{-1}$	0.710	0.328	0.037
$\Delta(WAGE)_{-1}$	2.221	0.575	0.000
$REC1_{-1}$	-0.100	0.012	0.000
$\Delta(CENTR)_{-1}$	0.098	0.030	0.003
STAT	2.307	0.466	0.000

Equation 2 for Δ(STRIKE)		$\sigma = 12.102$	
Variable	Coefficient	Std. Error	p-value
$\Delta(LEFT)_{-1}$	-1.442	0.860	0.102
$\Delta(SURPL)_{-1}$	8.513	3.870	0.034
$\Delta(WAGE)_{-1}$	17.402	7.922	0.035
$REC1_{-1}$	0.373	0.225	0.105
$\Delta(CENTR)_{-1}$	0.738	0.318	0.026
STAT	-10.500	4.505	0.025
Constant	-12.241	7.409	0.107

Equation 3 for Δ(LEFT)		$\sigma = 2.203$	
Variable	Coefficient	Std. Error	p-value
$\Delta(UNION)_{-1}$	0.283	0.181	0.127
$\Delta(STRIKE)_{-1}$	-0.043	0.029	0.143
$\Delta(MALE)_{-1}$	-0.935	0.710	0.196
$\Delta(SURPL)_{-1}$	-1.225	0.631	0.060
$REC2_{-1}$	0.078	0.021	0.000
$\Delta(PUADM)_{-1}$	1.246	0.973	0.209
STAT	-1.692	0.891	0.066
Constant	34.093	8.795	0.000

Equation 4 for Δ(INDUSTRY)		$\sigma = 0.363$	
Variable	Coefficient	Std. Error	p-value
$\Delta(STRIKE)_{-1}$	0.009	0.006	0.145
$\Delta(LEFT)_{-1}$	-0.039	0.028	0.170
$\Delta(INDUSTRY)_{-1}$	0.310	0.155	0.054
$\Delta(MALE)_{-1}$	-0.200	0.114	0.089
$\Delta(SURPL)_{-1}$	0.162	0.104	0.127
$\Delta(WAGE)_{-1}$	0.713	0.290	0.019
$REC1_{-1}$	0.017	0.008	0.051
$REC2_{-1}$	0.014	0.005	0.007
$\Delta(CENTR)_{-1}$	0.017	0.008	0.062
STAT	-0.847	0.164	0.000
Constant	5.649	2.097	0.010

Equation 5 for Δ(MALE)		σ =0.379	
Variable	Coefficient	Std. Error	p-value
Δ(LEFT)_-1	-0.030	0.027	0.271
Δ(SURPL)_-1	-0.419	0.105	0.000
Δ(WAGE)_-1	0.419	0.224	0.070
REC2_-1	0.012	0.002	0.000
Δ(CENTR)_-1	-0.016	0.010	0.125
STAT	-0.510	0.126	0.000
Constant	5.224	1.232	0.000

Equation 6 for Δ(SURPL)		σ =0.470	
Variable	Coefficient	Std. Error	p-value
Δ(STRIKE)_-1	0.017	0.007	0.020
Δ(LEFT)_-1	-0.067	0.031	0.039
Δ(INDUSTRY)_-1	0.281	0.170	0.107
Δ(WAGE)_-1	0.372	0.305	0.231
REC1_-1	0.026	0.009	0.009
REC2_-1	-0.010	0.005	0.087
Δ(PUADM)_-1	0.355	0.166	0.040
STAT	-0.224	0.194	0.257
Constant	-4.489	2.406	0.070

Equation 7 for Δ(WAGE)		σ =0.211	
Variable	Coefficient	Std. Error	p-value
Δ(UNION)_-1	0.025	0.020	0.217
Δ(INDUSTRY)_-1	0.170	0.076	0.031
Δ(WAGE)_-1	-0.171	0.147	0.252
REC1_-1	-0.019	0.004	0.000
REC2_-1	-0.008	0.002	0.001
STAT	0.212	0.103	0.047
Constant	-2.929	0.995	0.005

Goodness of fit

loglik = 92.951787 log|Ω| = -4.42628 |Ω| = 0.01195895 T = 42
LR test of over-identifying restrictions: Chi²(42) = 27.9604 [0.9527]

Correlation of residuals

	Δ(UNION)	Δ(STRIKE)	Δ(LEFT)	Δ(INDUSTR)	Δ(MALE)	Δ(SURPL)	Δ(WAGE)
Δ(UNION)	1.000						
Δ(STRIKE)	-0.037	1.000					
Δ(LEFT)	-0.056	0.249	1.000				
Δ(INDUSTRY)	0.049	0.075	-0.104	1.000			
Δ(MALE)	0.452	0.0051	-0.064	-0.013	1.000		
Δ(SURPL)	0.402	-0.044	0.330	0.433	0.170	1.000	
Δ(WAGE)	-0.245	-0.171	0.032	0.142	-0.162	-0.185	1.000

Diagnostics

	Portmanteau 5 lags	AR 1- 2F(2, 26)	Normality Chi²(2)	ARCH 1 F(1, 26)
Δ(UNION)	4.169	5.265 [0.0120] *	4.936 [0.0848]	0.447 [0.5092]
Δ(STRIKE)	2.846	4.020 [0.0301] *	5.688 [0.0582]	1.070 [0.3103]
Δ(LEFT)	4.866	1.717 [0.1992]	17.222 [0.0002] **	0.113 [0.7387]
Δ(INDUSTRY)	1.227	0.578 [0.5676]	0.607 [0.7380]	0.474 [0.4968]
Δ(MALE)	8.042	4.925 [0.0153] *	9.479 [0.0087] **	0.205 [0.6541]
Δ(SURPL)	8.912	4.691 [0.0182] *	12.215 [0.0022] **	0.499 [0.4859]
Δ(WAGE)	10.27	3.017 [0.0663]	1.284 [0.5262]	0.093 [0.7616]
Vector portmanteau 5 lags = 219.59				
Vector AR 1-2 F(98, 97) = 0.974 [0.550]				
Vector normality Chi²(14) = 62.233 [0.0000] **				

Since we paid more attention to modelling the relationships in the socio-political sphere (union membership, strike participation, political voting), our comments will be limited to the first three equations. Our short-run controls preserve their significance and expected sign: union centralisation affects positively union membership and strike activity, whereas the positive effect of the public employment share onto left voting is limited. In the short run union density is positively affected by the bargained real wage. The step variable STAT, capturing the increase in legislative support for the workers, exhibits a positive impact on union density, corresponding to 2.3 percentage points. The cointegration residual is significant and exhibits the correct sign, implying a convergence to the long-run behaviour. The variable STAT also has a negative impact on strike participation, probably because of a reduced perceived need of industrial action when union prerogatives are protected by law. The surplus variable has a short-run positive impact on strike participation. Even if in the long run the social conflict is harsher when the available surplus is low, in the short run people seem more willing to strike the greater are the expected gains. Given the step-wise nature of LEFT, it is hard to interpret the signs of the regressors in its equation. We find that increases in unionisation and in public employment yield a short-run push to left voting.

Our model suffers from some non-normality of residuals, which may be due to the particular dynamics of left, a step-wise variable. The other system diagnostics are reassuring, especially when excluding residual autocorrelation of the first and second order. As it can be seen from Figure 4, the ability of our estimates to replicate actual data is rather good, especially if one realises that our VAR includes variables that underwent structural changes during the sample period (variables industry, male , wage). The empirical model captures the large fluctuations occurred during the turbulent 70's, and in particular it replicates rather well the two turning points of the unionisation cycle that is peculiar to the Italian experience.

[insert figure 4 around here]

3.6 Links with previous literature

How do our results match previous empirical analyses of union membership ?
As far as Italian aggregate data are concerned, we are only aware of work by La Valle (1989 and 1992). He finds evidence of a positive impact of the following variables on the union density: the bargained wage, changes in real output, the unemployment rate, strike participation.[20] Aggregate data were also used by Freeman and Pelletier (1990). They conclude that aggregate British union density in the period 1945-1986 was positively affected by the manufacturing share of employment, the unemployment rate and the inflation rate of consumer prices. Moreover they stress the existence of a positive impact of a "legal index" measuring the attitudes towards the unions of the government in place. Pehkonen and

Tanninen (1994) estimated an equation for the Finnish union density using aggregate data for the period 1962-1992. They find that the following variables have a positive impact on union membership: the wage rate, the unemployment benefit, the unemployment rate and a step-variable measuring the change in the pro-union attitude of the government. They also find a negative impact of the agricultural component in the labour force.

Insofar as we also use aggregate data, the above mentioned literature is the one which is most directly comparable with our analysis. Notice, however, that our approach allows the distinction between the short-run and the long-run impact of each variable. This did not happen in previous contributions.

The results from our analysis that are in accordance with those of the above literature are the following:

* a positive effect on union density of the bargained wage (however, only in the short run);

* a positive effect of strike activity (both in the short and in the long run);

* a positive effect of the unemployment rate (only in the long run);[21]

* a positive impact of the legal support from pro-union governments (in the short run).

On the other hand, we do not find evidence of a positive effect of the share of employment in the industry, which in our estimated model is exogenous to the process in the long run.

Another strand of literature has adopted an approach based on cross-section analysis. Using firm level data, both Corneo and Lucifora (1997) and Booth and Chatterji (1993) find that plant level union density is independent of the bargained wage (respectively using Italian and British datasets). Goerke and Pannenberg (1998), using micro data for Germany and Great Britain, also find that the likelihood of union membership is unaffected by wages. Our results do not contradict this evidence, since union membership at the aggregate level turns out to be independent of the bargained wage in the long run.

Working on individual data obtained from Eurobarometer, a social survey conducted in several European countries including Italy, Blanchflower (1997) finds that men and public sector workers are more likely to join the union. Similar results about gender attitudes towards unionisation are found by Card (1998) and van den Berg and Grift (1998). Our results are not in contradiction with these findings. Our analysis puts forward a short-run positive impact of the male component in the labour force. However, the public sector share in employment is statistically insignificant in our sample.

Finally, both Ingham (1995) and Goerke and Pannenberg (1998) study the impact of social custom variables. The former article uses data for Great Britain and finds that the individual probability of union membership increases if family members belong to a union and if the individual's perception of the workplace density increases. The latter finds for Germany a positive impact of peer pressure within the family on the probability to join the union. This paper also investigates the empirical relationship between union membership and preferences for political parties, finding mixed results. This can be compared with the fact that we were not

able to find a direct impact of the votes to the left on union density. However, we found some evidence of social custom factors as proxied by strike participation.

On the whole, our results are quite in line with those previously obtained in the literature. The current analysis goes however beyond the previous one since our approach can distinguish between short-run relationships and long-run relationships. A further important novelty is the introduction in the empirical analysis of union membership of a variable measuring available surplus. This new variable has a sound theoretical justification and performs well in all regressions we have run.

4. Concluding Remarks

The current work contributes to bridge the gap between recent theoretical developments in models of union membership and their empirical scrutiny. First, we have detailed a framework that presents the main explanatory factors put forward in the theoretical literature, i.e. the social custom and the strategic factors, in a systematic way. Second, we have tackled the issue whether these factors can account for the long cycle displayed by trade union membership in Italy during the post-war period. The first empirical model we analysed finds evidence supporting the strategic effect. The social custom effect, as proxied by ideological voting and a work organisation favourable to workers' social interactions, does not seem to affect union membership. The second empirical model was based on an enlarged set of potential regressors. There, we found evidence of a positive correlation between the degree of participation to strike activities and unionisation. To the extent that one can interpret strike participation as an indicator of solidaristic values within the workforce, our results reveal that the social custom approach sheds some light on the Italian experience. Furthermore, our results suggest that Italian union officials acted strategically, increasing their effort to promote union membership in periods of large available surplus. Labour legislation in favour of union activity and the degree of centralisation of union activity appear to have contributed to reduce the extent of management opposition and have thereby fostered unionisation. On the whole, our results are in line with those previously obtained in the literature, both on time series models and at individual level.

[1] While the behavioural rules discussed here were introduced without reference to individual optimisation, they are not necessarily inconsistent with it. See e.g. Clark and Oswald (1998). Furthermore, experimental economics lends support to the claim that social exchange is an important incentive device to overcome problems of collective action. See Gächter and Fehr (1997).

[2] There may also be countervailing incentives to such a strategy. If the trade union refuses to help workers who are not its members, people may feel that the union does not truly embody solidaristic values. This may lead to a crowding out of the intrinsic incentives to join the union. See Frey (1997) for a general discussion and a formal treatment of this notion of crowding out.

[3] Italian constitutional law requires a "fair compensation" for wage labour. Labour courts have extensively referred to negotiated wages between unions and firms as a proxy for "fair compensation", thus extending *de facto* the applicability of national wage agreement to the whole labour force (*erga omnes*). For a better description of the Italian labour market see Demekas (1994) and Prasad and Utili (1998).

[4] There is a third general confederation of Italian unions, named UIL, inspired to liberal ideologies (socialist and republicans). Total UIL members (including retirees) in 1990 were 1.485.758, while analogous figure for CGIL and CISL were respectively 5.150.376 and 3.508.391. Membership data for this union are available starting from 1970 only, and their reliability is dubious (at least for initial years). In addition they do not provide the disaggregation between active workers members and retirees members. Therefore we have decided to exclude these data from our analysis. Analogous practice has been followed by OECD (1991) and Golden-Wallerstein (1995). There are also minor confederations (CISNAL, SLAI-COBAS and RdB), but official data are not available on a time series dimension. We conjecture that these exclusions may distort the results in specific sectors (for example in parts of the public administration), but on average they should leave the temporal dynamics unaffected. See the appendix in OECD (1991).

[5] Retiree members were 46.80% of total CGIL membership in 1990, whereas the same figure for CISL was 37.52%. Under the previous retirement scheme (pay as you go), they do not obtain direct benefit from wage bargaining at firm level. However, general agreements on wage indexations have offered significant increases in their standards of living (especially the extension of the wage indexation scheme - *scala mobile* - to pension calculations). Finally, retirees have reduced impact on the general confederations, since each retiree member counts for one third (or one fourth, depending on the Confederation) of an active worker member in leadership elections during the congresses.

[6] In order to investigate sectoral specificities, in Checchi and Corneo (1996) we have also analysed the unionisation rate in the manufacturing sector, but the results are very similar in the two cases. Therefore here we report results for the whole economy only.

[7] One would like to measure the percentage of left voting among dependent workers, but unfortunately this information is obviously absent. One may also object that solidaristic values are also proper to the catholic tradition, and they actually inspired a large fraction of Italian trade-unionism (see Romagnoli (1980)). However this tradition was more congenial to the development of catholic associations (like *AC-Associazione Cattolica* or *ACLI-Associazione Cattolica Lavoratori Italiani*), which are non bargaining entities providing services to their members (meetings, sportive events, legal support).

[8] This is consistent with the view that, when voting, individuals maximise their "social" objective function. This, in turn, can be justified by the traditional distinction between private and social values [e.g., Arrow (1963)].

[9] An alternative interpretation of the same variable is that it proxies the ratio of manual to non manual workers. If the formers display greater social interactions than the latters, this is consistent with our interpretation in terms of enforceability of the social custom.

[10] Unemployed workers obtain a benefit equal to 25% of the previous wage, for 6 months or 2 years according to whether they were working in a firm with more or less than 15 employees; see Demekas (1994).

[11] We have to state clearly that this variable is a proxy itself of financial centralisation, and is referred to CGIL confederation only. As long as total resources (and the face value is only a portion of it) are splitted between the central and the local level of the union in the same way as the face value revenues are, then this variable is an acceptable measure for centralisation. For this reason later on we remove this variable from the cointegrating vector analysis and we consider it as a short term control. An alternative measure is obtained considering *membership concentration* (using the ratio of the members in the most numerous federation to total membership in the confederation - CGIL and CISL only), but this variable is altered by several internal reorganisation within the sample period, and therefore we discarded it.

[12] See Johansen and Juselius (1992) for a similar strategy in a different context.

[13] An F test that compares the model with i lags to the model with i+1 lags cannot reject the more parsimonious model at the 5% level of confidence.

[14] See Johansen and Juselius (1990) for details. Even if they are not necessary under the current approach, single variable Dickey-Fuller tests for stationarity are reported in the Appendix.

[15] A third eigenvector is also possible if we raise the confidence interval to 5%. However, the small sample correction indicate the existence of just 1 cointegration vector (2 in case of 5% threshold). For this reason we discuss the two vector case in the text.

[16] Evidence of lower unionisation rates for women are found in individual micro-data sets for US [Card (1998)] and the Netherlands [van den Berg and Grift (1998)].

[17] If we conduct an analysis of causality on union density and the real wage (under the assumption that all variables are I(1) and therefore using first differences and introducing a cointegration residual in the equations), it appears that union membership causes the real wage but is independent of it. See Table A.3 in Appendix 1 in Checchi and Corneo (1996).

[18] Choosing to normalise equation (6) instead of equation (7) with respect to strike participation renders hard to explain why the available surplus should exert a negative impact on strike activity. A significant effect of strike activity on union membership has already been found for Italian data in LaValle (1989) and (1992).

[19] The data accept the further restriction of setting the SURPLUS coefficient equal to zero in equation (4). In this case the long run relationships become

$$\text{UNION} \ = \ 0.392 \cdot \text{STRIKE} \ + \ 6.617 \cdot \text{SURPLUS} - 3.37 \cdot \text{TREND} \qquad (3')$$
$$\text{STRIKE} \ = \ 0.778 \cdot \text{MALE} \ + \ 5.063 \cdot \text{LEFT} - 0.21 \cdot \text{TREND} \qquad (4')$$

loglik = 33.766 unrloglik = 44.584

LR-test, rank=2: Chi²(13) = 21.635 [0.0613]

However the LR-test is close to the significance threshold, and this explains why we have preferred the alternative version presented in the text.

[20] Since sample means are omitted, it is impossible to compute the relevant elasticities (see table 1 in LaValle 1989). His estimation period is 1950-1986. In some regressions he also finds a negative impact of the number of hours of strike for participant worker.

[21] Since our SURPLUS variable is given by the difference between labour productivity and alternative wage (obtained as the product of the wage in non-union sector and the employment rate), an increase in the unemployment rate lowers the alternative wage and raises the available surplus.

References

Accornero, A. (1992), *La parabola del sindacato*, Il Mulino, Bologna.

Adams, J.S. (1963), Toward an understanding of inequity, *Journal of Social Psychology* 67, 422-436.

Aronson, E. (1979), *The Social Animal*, W.H. Freeman, San Francisco.

Arrow, K. (1963), *Social Choice and Individual Values*, John Wiley & Sons, New York.

Blanchflower, D. (1997), The role and influence of trade Unions in the OECD, LSE CEP Working paper

Blanchflower, D. and R. Freeman (1992), Unionism in the United States and other advanced OECD countries, *Industrial Relations* 31, 56-79.

Booth, A. (1985), The free rider problem and a social custom model of trade union membership, *Quarterly Journal of Economics* 100, 253-261.

Booth, A. and M. Chatterji (1993), Reputation, membership and wages in an open shop trade union, *Oxford Economic Papers* 45, 23-41.

Booth, A. and M. Chatterji (1995), Union membership and wage bargaining when membership is not compulsory, *Economic Journal* 105, 345-360.

Carruth A. and R. Disney (1988), Where have two million trade union members gone?, *Economica* 55, 1-19.

Checchi, D. and G. Corneo (1996), Social custom and strategic effects in trade union membership: Italy 1951-1993, Discussion Paper A-526, University of Bonn.

Clark, A. and A. Oswald (1998), Comparison-concave utility and following behaviour in social and economic settings, *Journal of Public Economics* 70, 133-155.

Coleman, J., (1990), *Foundation of Social Theory*, Harvard University Press, Cambridge Mass.

Card, D., (1998), Falling Union Membership and Rising Wage Inequality: What is the Connection ?, NBER Wp.6520, April

Corneo, G. (1995), Social custom, management opposition, and trade union membership, *European Economic Review* 39, 275-292.

Corneo, G. (1997), The theory of the open shop trade union reconsidered, *Labour Economics* 4, 71-84.

Corneo, G. and C. Lucifora (1997), Wage formation under union threat effects: theory and empirical evidence, *Labour Economics* 4, 265-292.

Demekas, D. (1994), Labour market institutions and flexibility in Italy: a critical evaluation and some international comparisons, IMF Working Paper n.94/30.

Freeman, R. (1986), The effect of union wage differential on management opposition and union organizing success, *American Economic Review* (P&P) 76, 92-96.

Freeman, R. and J. Pelletier (1990), The impact of industrial relations legislation on British union density, *British Journal of Industrial Relations* 28/2, 141-164.

Frey, B. (1997), On the relationship between intrinsic and extrinsic work motivation, *International Journal of Industrial Organization* 15, 427-439.

Gächter, S. and E. Fehr (1997), Collective action as a social exchange, mimeo, University of Zürich.

Goerke, L. (1997), An open shop, wage bargaining, and taxation - a note, *Oxford Economic Papers* 49, 651-657.

Goerke, L. and M. Pannenberg (1998), Social custom, free-riders, and trade union membership, mimeo, University of Konstanz.

Golden, M. and M. Wallerstein (1995), Unions, employers and collective bargaining: a report on data for the 16 countries from 1950 to 1990, mimeo.

Holländer, H. (1990), A social exchange approach to voluntary cooperation, *American Economic Review* 80, 1157-1167.

Ingham, M. (1995), Union joining: an empirical test of the social custom model, *Applied Economics Letters* 2, 245-247.

Johansen S. and K. Juselius (1990), Maximum Likelihood Estimation and inference on cointegration - with applications to the demand for money, *Oxford Bulletin of Economics and Statistics*, 52, 2, 169-210.

Johansen, S. and K. Juselius (1992), Testing structural hypotheses in a multivariate cointegration analysis of the PPP and the UIP for UK, *Journal of Econometrics*, 53, 211-244.

Kandori, M. (1992), Social norms and community enforcement, *Review of Economic Studies* 59, 63-80.

La Valle, D. (1989), Esiste un ciclo della partecipazione sindacale ? Osservazioni sulla esperienza italiana, *Quaderni di sociologia* 34/12, 33-66

La Valle, D. (1992), Un modello previsivo della sindacalizzazione, *Quaderni di sociologia* 37/1, 79-96

Naylor, R. and M. Cripps (1993), An economic theory of the open shop trade union, *European Economic Review* 37, 1599-1620.

Naylor, R. and O. Raaum (1993), The open shop union, wages and management opposition, *Oxford Economic Papers* 45, 589-604.

OECD (1991), Trends in trade union membership, chapter 4 of *Economic Outlook*, July, pp.97-134 (by J.Visser).

Olson, M. (1965), *The Logic of Collective Action*, Harvard University Press, Cambridge.

Peetz, D. (1997), Why Join ? Why Stay ? Instrumentality, Beliefs, Satisfaction and Individual Decisions on Union Membership, Australian National University, CEPR Discussion Paper n.356, January.

Pehkonen, J., and Tanninen, H. (1994), Institutions, incentives and trade union membership, mimeo.

Prasad, E., and F.Utili (1998), The Italian labor market: stylized facts, institutions, and direction for reform, IMF Working Paper 98/42.

Romagnoli, G. (1980) (ed.), *La sindacalizzazione tra ideologia e pratica*, Edizioni Lavoro.

Silver, B., Arrighi, G. and Dubofsky, M. (1995) (eds), Labour unrest in the world-economy, 1870-1990, special issue of *Review*, 1/1995.

van den Berg, A., and Y.Grift (1998), Dutch trade union membership 1979-1995, paper presented at the 1998 EALE conference (Blackenberg).

APPENDIX - DATA SOURCES and STATIONARITY TESTS

Data sources

Data on union membership come directly from internal sources. The period 1950-77 is covered by Romagnoli (1980), whereas subsequent years are based on Baglioni G. and Squarzon C. (eds) (1992), *Rapporto CESOS sul mercato del lavoro 1991-92*, Ed.Lavoro, Rome. They are almost identical to those reported in Golden and Wallerstein (1995). We thank C.Squarzon (Agenzia Lavoro Regione Veneto) for directly providing the data covering the period 1990-93. Data on financial centralisation are obtainable from DiNicola, P. (1989), *Quarant'anni di tesseramento CGIL 1949-1988*, Ediesse, Rome.

Data on strikes for the period 1969-83 are obtained from ISTAT (1986), *Sommario di statistiche storiche 1926-1985*, Rome; for the subsequent years they come from ISTAT, *Annuario statistico italiano*, various issues. L.Bordogna (University of Brescia) kindly provided data antecedent 1969. Finally, S.Draghi (University of Milan) kindly provided data on electoral outcomes.

More traditional data (like sectoral value added, gross wages, man/hours, GNP deflators) come from national accounts; for the period before 1970 they have been reconstructed by Golinelli R. and Monterastelli A. (1990), *Un metodo per la ricostruzione delle serie storiche compatibili con la nuova contabilità nazionale (1951-1989)*, Nota di lavoro #9001 Prometeia, Bologna. Employment and unemployment series come from ISTAT, *Indagine trimestrale sulle forze di lavoro*, various issues; the decomposition between young and old in the labour force is based on data published by United Nations, and have been provided by G.Brunello (University of Venice). Consumer price index and utilisation rate are regularly published in Banca d'Italia, *Appendice alla Relazione del Governatore*, various issues.

Tab.A1 - *Stationarity augmented Dickey-Fuller tests.*

		p-value	num.lags
UNION	Membership (total)	0.363	3
CGIL	Membership (CGIL only)	0.162	3
CISL	Membership (CISL only)	0.729	4
LEFT	Votes to the Left	0.395	2
STRIKE	Strike participation	0.404	4
WAGE	Wage	0.756	4
SURPLUS	Available surplus	0.999	2
INDUSTRY	Industrial employment share	0.322	3
MALE	Male component in labour force	0.110	4
PUADM	Public employment share	0.987	3
CENTR	Centralisation of financial resources	0.053	3

Note: p-values indicate the probability of rejection of the null hypothesis of stationarity. Each regression contains a constant and a linear deterministic trend. The optimal lag length is chosen by using the Akaike Information Criterion.

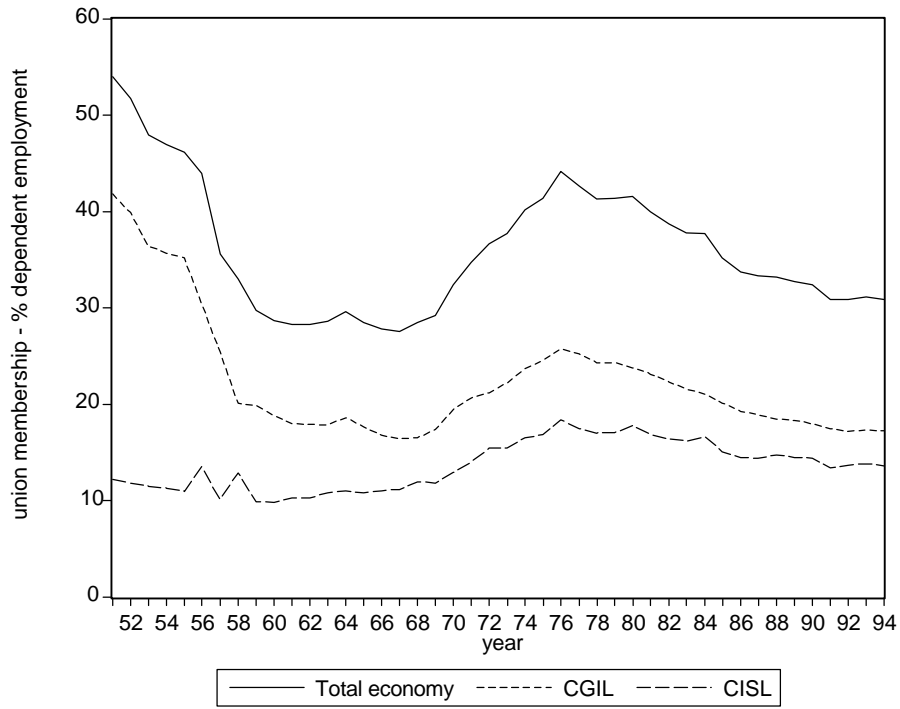## Fig.1 - Union membership rates - Italy
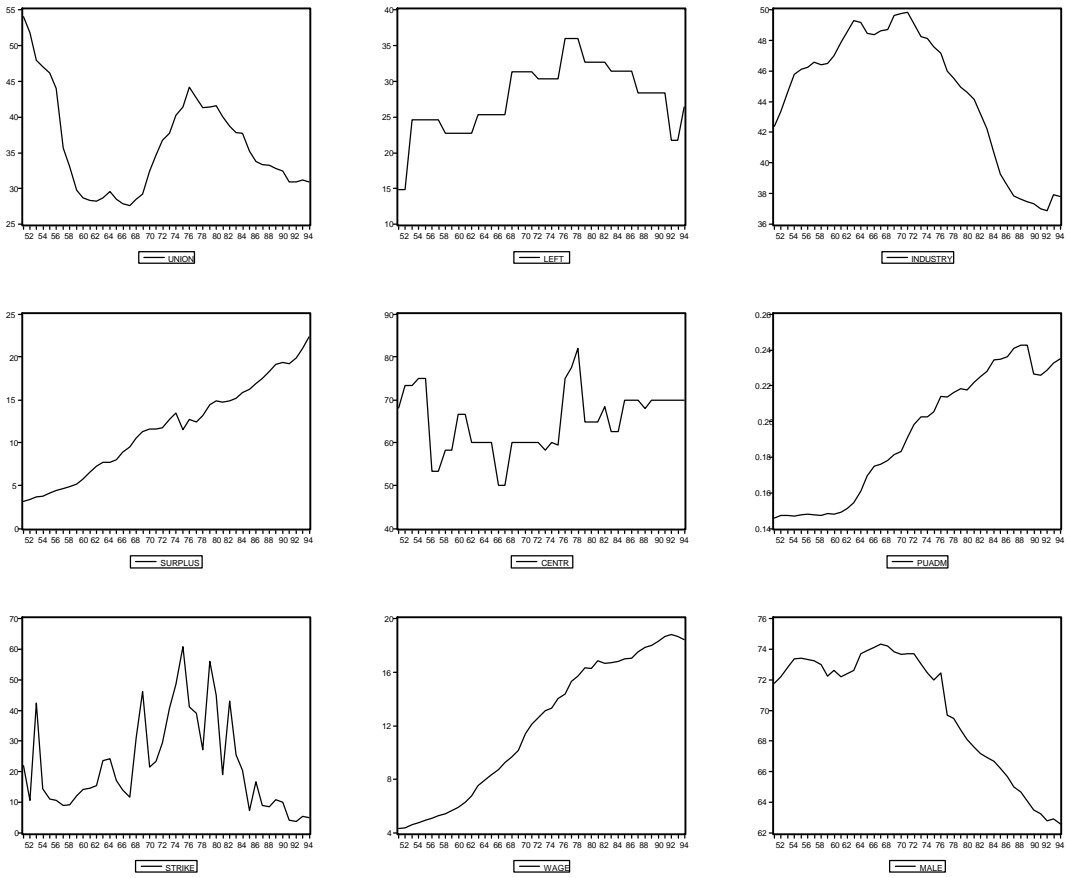

Fig.2 - Main variables

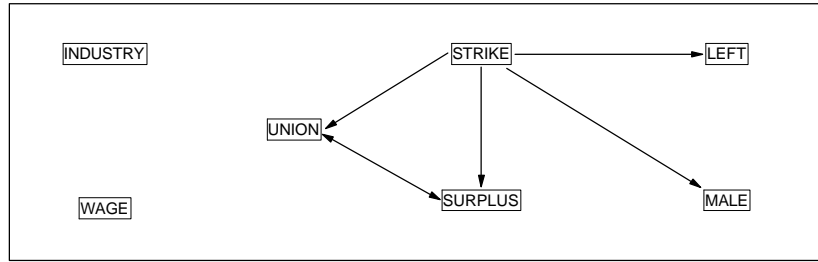Figure 3 - The long run causality structure of the data generating process

Fig.4 - Actual and fitted dynamics - levels (left) and first differences (right)