The Ups and Downs of Trade Union Membership in the Netherlands

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1. Introduction

Ever since its beginning, the Dutch trade union movement has experienced periods of growth and decline. Labour historians have frequently addressed this issue in a thorough yet descriptive manner, notably Windmuller et al. (1987). In contrast, explaining long-term trends in Dutch union membership with the aid of economic modelling has hardly been undertaken. Only two sociologists, Hendriks (1986) and Visser (1987) have made an effort but they hardly relate their findings to the economic history of the Netherlands.

Therefore, this paper aims to combine these two approaches. Dutch union membership will be studied by means of a time series analysis in the context of historical developments and events during the XXth century.

In international literature, two econometric models of union growth have been very influential. The first one comes from Ashenfelter and Pencavel (1969), the second from Bain and Elsheikh (1976). Both studies contend that there was no structural break in the period under consideration.

However, from the point of view of an economic historian, it would be very surprising indeed to find that only one model will suffice, if we speak of a period that lasts more than a few decades. In a 60 to 80-year period so many things change in a society, which may have an impact on unionization. One important category of changes that will often lead to a structural break, concerns changes in institutional arrangements and laws. Most countries have experienced such changes, and in many cases researchers have indeed

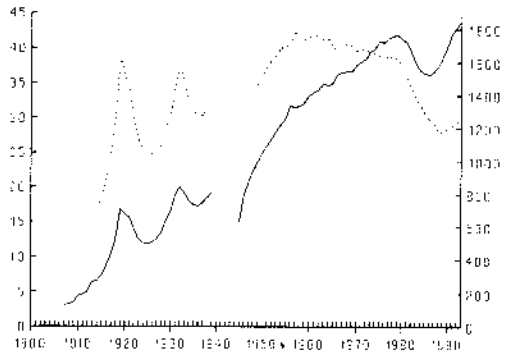
shown that these events have been responsible for a structural break in a model of union growth. Among others, this has been claimed for the U.S.A by Sheflin et al. (1981) and for the U.K. by Pedersen (1978).

In the next section some light is shed upon the history of Dutch union membership. An overview of the relevant theories and variables used in time-series analysis will be given in section 3, followed by a discussion in section 4 on whether the Dutch data are also characterized by a structural break. Thereafter in section 5 models are constructed that are tailored to Dutch circumstances. Section 6 concludes.

2. Fluctuations in Dutch trade-union membership during the XXth century[1]

Although the first trade unions in the Netherlands were founded in the 1860s, the first reliable statistics date back to approximately 1907. Graph 1 provides a good impression of the development in membership since then.

Figure 1 - Union membership in the Netherlands,1907-1993



___ absolute numbers (in thousands; see the right axis)
_ _ _ union density rate (in percentages; see the left axis)

[1] See for a more detailed description chapter 3 of my Ph.D thesis *Trade Union Growth and Decline in the Netherlands* (1995), pp. 29-83.

Despite the lack of data concerning the XIXth century, scholars agree that unions remained very small in that period. At the beginning of this century the development of the union movement in the Netherlands was strongly stimulated by the foundation of the socialist federation NVV in 1906. Owing to a good and centralized organizational structure, social benefit funds and strike funds, the NVV quickly attracted a lot of new members. This great success instigated the Protestant and Catholic unions to establish their own centres, with the same kind of facilities, in 1909. It formed the start of a longlasting tripartite division within the Dutch labour movement, often referred to as 'pillarization'.

The total size of the movement made steady progress between 1906 and 1920, a period of strong economic growth. Dutch neutrality during the first World War contributed to this favourable development. The next stage was characterized by a downswing of the business cycle and growing unemployment, which led to a strong decline in the number of union members. This see-saw pattern in the union membership rates repeated itself once more as the Dutch economy revived after 1924, followed by the depression of the 1930s. Apparently there existed a strong connection between union growth and the business cycle.

However, other determinants also played a role. Of course unions were able to exploit their increased bargaining power in times of economic growth. Entrepreneurs would then more easily give in to wage demands, which in turn attracted new union members. But the union movement also gained influence irrespective of the business cycle, as it gradually became an accepted institution by the employers and the government. Recognition by employers' associations revealed itself in a growing number of collective labour agreements, which prompted the government to make these agreements legally enforceable.

Another sign of state recognition was the allotted task of the unions in unemployment policies: between 1917 and 1940 the government subsidized union unemployment funds with an amount that equalled the deposits made by union members. This

became known as the 'Ghent system'. In the absence of state insurance schemes, it induced more people to join unions because they would rather receive benefit payments from their union than from private or public charity.

In recession periods the size of the labour movement was reduced. Especially at the early 1920s employers were better able to withstand union demands, and so most strikes were lost. Many disappointed workers resigned their union membership. The lack of unity in the Dutch union movement contributed to its weakness. Christian unions were much more complaisant with the employers and more easily gave in when they went on strike.

Still, the crisis of the 1930s showed that rising unemployment did not immediately lead to a drop in union membership. At first, numbers even increased and later the decline was not that large. This phenomenon could be ascribed partly to solidarity, and partly to the fact that unions remained useful for unemployed members, as they provided social benefits and the possibility of joining special unemployment unions.

During World War II all existing unions were abolished. A lot of people tried to grasp the opportunity of establishing labour unity directly after the war. However, the dominant three union federations of Socialists (NVV), Protestants (CNV) and Catholics (NKV) could not come to an agreement and were reinstated. Others then founded the Unity Centre (EVC). Only in the immediate post-war years did this centre attract a lot of disappointed workers, who were dissatisfied with the policies of the established trade unions. As the communist EVC was suspected of publishing flattering membership figures for some time, it was excluded from the statistics after 1951. Because of this unreliability the EVC is excluded from this research.

Despite the remaining tripartite division in the labour movement the federations did work together, jointly with employers' associations and the government, in order to rebuild the badly damaged economy and to prevent a recurrence of the workers' miseries during the 1930s. Partly due to this cooperation and the unions' willingness to refrain from real-wage increases, the reconstruction of the economy passed

off very well. Employment grew rapidly and gradually social security increased to a very high level. Strikes became very rare.

Owing to these favourable socio-economic developments, to which the unions had contributed considerably, their membership rates quickly increased until the end of the 1950s, after which it levelled off a little, despite ongoing economic growth. As the Dutch labour markets tightened, ever more members protested against the voluntary wage restraints agreed upon by their unions. This pressure led to the so-called 'wage explosion': from 1964 wages quickly rose to the average European level and even above, so that Dutch trade and industry gradually started losing its competitiveness. Also affected by a worldwide depression, unemployment began to increase during the 1970s.

The onset of this business deterioration did not coincide with an immediate exodus of union members. This was partly due to a much more active attitude by most labour unions since the early 1970s: they first fought for more worker participation, later for maintenance of purchasing power and ultimately for the preservation of jobs. Thus the total membership figure kept growing until 1979, after which unemployment rose dramatically. In those circumstances the unions had virtually no bargaining power and consequently lost many members. At the end of 1986 the trade union movement was at its nadir with a loss of about 14% membership compared to 1979. Afterwards the renewed growth of the Dutch economy created new employment; at first gradually, but from the 1990s at an increasing pace. As this so-called 'Dutch miracle' was to a large extent owing to the willingness of the labour movement to moderate its wage demands, unions were rewarded by a considerable growth in membership which continues to this day.

3. Time series analysis of union growth and decline

In this section the theoretical assumptions regarding the variables used in time-series models with respect to explaining trade-union membership fluctuations will be discussed, supple-

mented with additional insights regarding Dutch economic history. Not all the relevant causes of union growth can be taken into account, because not all determinants can be quantified in such a manner that they can be incorporated in time-series modelling. For that reason, a few influential factors such as religious beliefs are left aside. However, the great merit of this analysis lies in the fact that it indicates to what extent long-term membership fluctuations can be explained by a number of key variables.

Concerning the specification of the *dependent variable*, the annual rate of change in union membership is chosen. Several other specifications occur in the literature, but this form is most common. The most logical alternative form would be the union 'density rate', defined as the ratio of total union membership and the dependent labour force. Following the argument by Bain and Elsheikh (1976, p. 59) this latter variable has several drawbacks. For one, the density rate shows only small annual variations, which is a disadvantage in time-series analysis. Furthermore, the density rate can be an explanatory variable as well, so that it makes more sense to use the annual rate of change in membership on the left side of the equation. In the appendix an overview of trade-union membership fluctuations in the Netherlands is presented.

Next, all the relevant and available *independent variables* will be mentioned.

Inflation. Price increases are supposed to radiate a so-called "threat effect" on employees, inducing them to join or remain in a union, which is expected to defend real wages from inflation (Bain and Elsheikh, pp. 62-63). In the Dutch case, it is questionable whether this effect still played a role in the post-war era: at first increasing prices were balanced by pay-rises for everyone on account of the guided wage policy, and from the 1960s until 1982 the system of automatic price compensation was in force in all branches of industry. Moreover, since the middle of the 1980s the annual inflation has remained very modest.

Wages. A rise in wages is expected to stimulate union growth, as the workers credit such an income improvement to the trade

unions (Bain and Elsheikh, pp. 63-65). Dutch legislation on the extension of collective labour contracts to a whole sector might have mitigated this 'credit effect' after World War II.

Two objections are sometimes raised against the use of the wage variable. Firstly, some people argue that employers themselves raise wages as a way of avoiding unions, but this has happened only occasionally in the Netherlands. Secondly, there is a possible problem with regard to the direction of the causality between wage growth and union membership: an increase in the size of the union movement could just as easily cause wages to rise, in addition to, or instead of, rising wages causing membership rates to increase. Additional tests have proved that, in any case, changes in Dutch union membership are caused by wage developments, so that wage growth may be used as an explanatory variable.[2]

Unemployment. When unemployment first starts to rise, workers might decide to become or remain a union member in order to be protected against discharge. Furthermore, unemployed members often pay a reduced membership fee. However, as unemployment persists, the advantages of being a member might no longer weigh up against the costs, and then membership rates start to drop. In addition, during a period of high or rising unemployment unions are not able to obtain good results from wage bargaining, which also does not attract new members. (Bain and Elsheikh, pp. 65-67)

From the preceding section it becomes clear that rising unemployment in the Netherlands often did not lead to the resignation of members immediately, but only after some time. This suggests that the unemployment variable probably performs better in the model with a time lag.

Trade union density rate. If union density begins to increase from a low level, at first non-members are induced to join (the enforcement

[2] So-called Granger causality tests have shown that with respect to Dutch pre-war data, wages and membership influence each other mutually, and regarding the post-war data (real) wages do affect union growth, but not the other way round. See A. van den Berg (1992), pp. 12, 24.

effect). However, above a certain level any further extension of the labour movement becomes more difficult (the saturation effect). (Bain and Elsheikh, pp. 67-68) Therefore, it is best to incorporate this variable in two forms: linear and quadratic. In the Netherlands, the union density rate has never been very high; before World War II the average percentage stayed at 33% in the 1930s, which was also the case in most other countries. After the war the density rate rose quickly to about 41% in the 1950s, but subsequently stagnated completely; after 1980, it fell back to the pre-war level (cf. graph 1). The initial rapid increase may be associated with the enforcement effect, while the long-lasting stagnation might be related to the saturation effect, but given the relatively low level of the density rate this assumption can only be made with much caution.

Institutional variables. The percentage of left-wing parties in parliament can serve as a proxy for the extent of pro-labour sentiment in a society (Ashenfelter and Pencavel, 1969, pp. 438-439). Alternatively, it is also possible to examine the impact of a certain law on union membership, by using a dummy variable that takes the value 1 during the years that this law is in force.

The political climate has played a very important role in the determination of union growth and decline in several countries. However, Dutch union goals and activities were not much hindered by laws or by certain political parties. Owing to 'pillarization', all major parties maintained close relations with their allied union federations. The Labour Party (SDAP, later PVDA) made the most efforts to emancipate and benefit the working class, which might have had a stimulating effect on union membership rates.

As far as legislation is concerned, the 1937 Act on the extension of labour agreements created the possibility of 'free riding' among workers. The implementation of this law meant that the majority of the dependent labour force could profit from the unions' bargaining efforts without the need to be a member. Incorporating the effect of this law into the modelling was considered but the idea has been abandoned. This law was first really administered during the German occupation, and from 1945 by the new Dutch government. As will

become clear later on in this paper, it is necessary to estimate a pre- and post-war model separately; because the 1937 law was in force during the whole post-war era, its effect on union membership rates can therefore not be measured directly.

Strikes. (Successful) strikes often induce workers to join a union[3], not least in order to receive strike pay (Schnabel, 1989, p. 138); this membership accretion is called "war profits", and it is the difficult task of the union to hold on to these members subsequently. In the Netherlands, the number of strikes and workers involved was much higher before than after the second World War. Directly after the liberation all emphasis was put voluntarily on rebuilding the economy, which gave no place for counterproductive labour disputes. Only the radical federation EVC did not go along with this co-operative attitude and organized many strikes in the first post-war years. Thereafter the EVC lost its power, and Dutch labour relations became characterized by a large degree of industrial peace.

Social benefits payments. The increasing government expenditures on social welfare can be regarded as a substitute for the social security insurance that unions used to offer before the war, thereby reducing the attractiveness of union membership (Neumann and Rissman, 1984, pp. 176-177, 182-186). The extension of the Dutch welfare state resulted in a huge growth in social benefits payments by the government. As a percentage of the net national income, this rose from 10% in 1948 to almost 36% in 1993.

4. The Dutch data and their peculiarities

Given the expectations that follow from the theoretical and historical literature, as many relevant explanatory variables as possible have been collected, for as long a period as possible. Unfortunately,

[3] The question of causality might be postulated with regard to the relation between strikes and membership growth. It could also be argued that a growing union movement might lead to more strikes. This has been tested, and it was found that it is justified to treat strikes as an explanatory variable, just like the wage variable.

the data are far from perfect for three reasons. Firstly, no statistical information exists at all about a few variables, a weakness which cannot be redressed. Secondly, some important variables suffer from changes in definition, which precludes creating consistent time-series. We have tried to solve this problem as effectively as possible. Thirdly, some variables are only recorded after a certain year, or stopped being recorded after a certain year. This problem can only partly be resolved by approximating the missing values. Although reliable membership figures are available from 1907 onwards, some of the important explanatory variables begin only at a later date. Furthermore, hardly any statistics are available concerning the war years (1940-1945).

Due to missing observations during the second World War, the time-series is not continuous, which in turn implies that it is difficult to fully exploit the time-series potential of the data. If observations are missing over a fairly large coherent subperiod this may affect the efficiency of the modelling estimates, which makes it very hard to determine a correct specification when using an auto-regressive model. Therefore, it was decided to choose the relatively simple and well-known Ordinary Least Squares (OLS) method.[4]

OLS may be applied when all the OLS-assumptions hold true. One of these assumptions concerns a constant variance of the residuals (homoscedasticity). Further research has proved that this is not the case with respect to the data used in this paper, when a model is estimated that covers the whole period (1914-1993). It is possible to solve this issue, but an important question raised is whether it is wise to try estimating one model which comprises the entire period. This difficulty can be tackled using technical as well as historical arguments. If we judge on the basis of the heteroscedasticity problem in the outcome of the modelling, there is much to be said for the construction of two separate models, one

[4] OLS starts from the assumption that the observations in all periods are independent drawings from an identical distribution. This means that the specific time-series structure of the data cannot be exploited when using OLS, but it also means that breaks in the time-series will not affect the efficiency of the model estimates, presuming that all OLS-assumptions are met.

with respect to the pre-war period and one with respect to the post-war period.[5]

Due to the presence of heteroscedasticity a formal test on the occurrence of a structural break cannot be performed on the Dutch data. Instead, the coefficients of the two submodels can be compared with each other, to check whether these are stable or not. If the latter case holds, this will further support the argument in favour of separate modelling.[6]

Another indication of separate modelling is shown in table B of the appendix, in which the simple statistics are given, with respect to the two separate periods. When comparing these two periods, the relative differences between the means of the variables within each sub-period are very distinct.

If we judge on the basis of Dutch social-economic history, this strongly supports the choice for separate modelling. The working and living conditions of Dutch workers before World War II differed from the post-wat period; and in the discussion of the relevant variables in section 3 it was already noted that some variables probably had more impact on union membership developments before the war, while others were assumed to be more influential after the war. This was not the result of one specific event such as a new law or institution.

[5] With respect to the model covering the whole period, it is found that the residuals have a much larger variance before World War II than thereafter, but also that *within* the two sub-periods the error variance is constant.

[6] According to Godfrey (1990, p. 141) "Chow's tests will not be robust to violations of the [OLS] assumptions. Autocorrelation, heteroscedasticity and non-normality will all affect the validity of the tests to some degree". More details on technical matters can be found in chapter 4 of my thesis (1995), pp. 85-118. There it is explained that the coefficients of the relevant variables in the two submodels do indeed differ a lot from each other. It is remarkable that in two other studies on Dutch membership fluctuations, by Visser (1987) and Hendriks (1986), the whole period is also analyzed by means of just one model, without any mentioning of a heteroscedasticity problem. Working with, by and large, the same data, they presumably would have found the same broad error structure as in this research; but they probably did not check this. Using OLS, both studies yield low DW statistics. Hendriks does comment on this finding, but he does not draw the conclusion that it means that the significance of the estimates cannot really be determined. Although both authors do mention the possibility of a structural break in the Dutch data, their emphasis lies on the interpretation of an (uncorrected) model which covers the whole period.

Much more relevantly, the causes must be sought in the combined effect of the economic depression of the 1930s and of the destruction during the war. When the Netherlands were liberated, the ideas already existing for rebuilding Dutch society (not just economically, but also institutionally) could be put into practice.

When comparing pre- and post-war Holland with respect to our research object, it can be stated that after the second World War, *security* for the workforce increased tremendously if gradually. Price increases were compensated by wage increases, collective labour agreements were usually extended to a whole branch of industry, protection against discharge was greatly increased by law, and a variety of social benefits prevented the unemployed, disabled and retired workers from being thrown into poverty.

All this, and more, has changed the position of the workers. Most probably, these changes would have had their impact on the decision-making process on whether or not to join, to leave, or to stay in a union. It is conceivable that the arguments for becoming a member before the war, were different from those after the war. In any case, aftert the war the union movement experienced a much more stable growth pattern than in the pre-war era.

The remainder of this paper will be dedicated to the construction of two separate models, specified according to the theoretical expectations with regard to the determinants of pre- and post-war unionization respectively.[7]

5. Empirical results

The new modelling needs to be based on the theoretical assumptions that derive from the international literature, taking the

[7] One final point that should be addressed here concerns the *number* of breaks in the model. Since no formal test could be applied, the choice was largely based on sound reasoning and a little on pragmatic grounds. With respect to the latter, it can be argued that an additional break in the pre-war period would endanger the reliability of the estimation results, due to the relatively small number of observations. The post-war period suffers less from this problem, but there never has been a specific event which justifies another break.

specific developments of the Dutch trade union movement into consideration as well. In the following subsections the estimation results of the pre-war model and post-war model will be shown and interpreted.

5.1 The pre-war model. Section 3 dealt at length with the question of which variables were expected to be of influence on union growth and decline in the Netherlands, and whether these determinants would be of importance during the whole century, or just in one of the two sub-periods. In short, it is assumed that the rate of inflation, wage changes, the level of unemployment, the number of strikes and the proportional share of left-wing parties in Parliament might have played a role before the second World War.

The remaining possible variables are supposed to have been more influential in the post-war era, and will not be included in the pre-war model. These regard the union density rate, because a saturation effect is not likely to have occurred in pre-war Netherlands, since the density rate was rather low at that time; and the social benefit payments by the government, because the growing substitution effect could only develop after the war, when the state gradually provided more and more social benefit payments. Both suppositions are confirmed by additional analyses (cf. van den Berg, 1995, p. 99).

Beforehand, it was assumed that inflation (ΔP_t) will exert a stimulating (threat) effect on union growth, just as pay rises (ΔW_t) will lead to a stimulating (credit) effect.[8]

The unemployment variable will be taken up in the model with and without a lag, to test whether unemployment will in the first instance (U_t) induce workers to join or to stay in the union in order to be better protected against discharge; if unemployment persists

[8] Visser (1987) and Hendriks (1986) both found ΔP and ΔW could not be combined in one and the same model due to multicollinearity. In general it is said that if the correlation coefficient between two variables is greater than 0.9, multicollinearity may be severe. In this research, between ΔP_t and ΔW_t a correlation coefficient of 0.63 is found in the pre-war period (and between ΔP_{t-1} and ΔW_t a coefficient of 0.84); this suggests only minor problems with regard to the inclusion of both ΔP_t and ΔW_t.

(U_{t-1}) it is assumed that it will discourage people and prompt them to leave the union.

The strike variable will also be incorporated with and without a lag: there are indications that strikes might have incited workers to join a union at first (S_t), but that they changed their mind later on (S_{t-1}) if the immediate cause of the labour dispute was solved or, before World War II, because there was more danger of employer retaliation.

Finally, the variable $Left_t$ is included to estimate if, and to what degree, the influence of left-wing parties in the Second Chamber had a positive impact on unionization.

In table 1 the results of the pre-war modelling are shown. Each estimation has used 28 observations, which means that the research period covers the years 1912 up to and including 1939.

Table 1. Determinants of union growth before the war (t-values in brackets)

		(1)	(2)
	adj. R^2	0.738	0.760
	D.W.	1.894	1.810
	root MSE	5.636	5.392
	# obs.	28	28
Constant		30.700**	26.834***
		(2.302)	(6.169)
ΔP_t	% change in consumer prices	0.356	0.382*
		(1.602)	(1.923)
ΔW_t	% change in gross nominal wages	0.629***	0.603***
		(3.296)	(5.157)
U_t	level of total unemployment (in 1,000's)	0.049**	0.047**
		(2.308)	(2.417)
U_{t-1}	level of unemployment, lagged with 1 year	-0.079***	-0.080***
		(3.592)	(4.017)
S_t	number of strikes	-0.002	
		(0.072)	
S_{t-1}	number of strikes, lagged by 1 year	-0.067***	-0.067***
		(4.967)	(5.484)
$Left_t$	% share of Left in Parliament	-0.131	
		(0.362)	

*significant at 10% level
**significant at 5% level
***significant at 1% level

The first column gives the estimates of a model which includes all variables that are supposed to be of importance. As can be seen, not all coefficients are significant. Inflation nearly reaches the 10% significance level, while the parameters of S_t and $Left_t$ are very insignificant. Dropping one or more of these three in subsequent estimations shows that the other four parameters (of ΔW_t, U_t, U_{t-1} and S_{t-1}) are always very significant with the expected signs; phrased differently: these four are robust estimates. If S_t and $Left_t$ are removed from the model, the price coefficient becomes significant as well (see equation no. 2).

All model specifications come up with a DW value that lies in the so-called inconclusive area: this means the DW statistic does not give a decisive answer about the presence of auto-correlation. With respect to the second equation, additional analysis of the auto-correlation function reveals that there is no auto-correlation.

The results can be interpreted as follows.

A rise in consumer prices as well as wage increases lead to membership gains. The latter has a particularly strong impact: a pay rise of 1% results in an extra growth in union membership of 0.6% .

The outcome regarding the unemployment variables is very interesting: U_t has a significantly positive effect, while U_{t-1} has a significantly negative effect. This confirms the theoretical notions. The corresponding coefficients of +0.047% and -0.080%, respectively, imply that eventually the negative impact dominates: in the end persistent unemployment reduces the size of the union movement.

A remarkable result is found with respect to the strike variables. The assumption that strikes induce people to join a union does not hold true in the case of pre-war Netherlands: the parameter of S_t remains insignificant in all different model specifications. On the contrary, S_{t-1} has a very significantly negative effect on unionization, and it is not possible to get round the robustness of this finding. It means that workers leave the union as a result of increased strike activities in the past. This outcome must be placed against the background of Dutch society in the first decades of this century. On the one hand, workers enjoyed much less security in

those days: strikers could easily be dismissed. On the other hand, partly due to the strong influence of religious beliefs, many people were unfavourably disposed towards strikes, as this contravened their principles of co-operation.

Lastly, the supposedly stimulating effect of left-wing parties on union membership rates is rejected in all estimations. This might be explained by the fact that owing to the 'pillarization', all political parties, from left to right, maintained relations with their allied union organizations. In addition, the variable $Left_t$ consists before World War II almost exclusively of the percentage number of seats of the SDAP, which never became a government party.

To round off this subsection, graph 2 shows the actual and estimated values of the dependent variable based on the second pre-war model. It can be seen that the estimated values follow the actual ones quite reasonably, except for the period 1925-1927. This wrong prediction is probably due to the strong wage growth in the years 1925 and 1926, after a period of rapidly declining wages. It would seem that the model gives too much weight to this recovery.

Figure 2. Actual and estimated values of the rate of change in Dutch union membership before the second World War

___ actual values _ _ estimated values (based upon table 1, equation 2)

5.2 The post-war model. With respect to the theoretical assumptions that underlie the post-war model, the following considerations have been made.

In section 3 it has already been argued that the influence of inflation and wage increases on unionization probably became much smaller after World War II. During the major part of this period, price rises were automatically compensated by pay rises, while (union-negotiated) wage increases applied to all workers, union members and nonmembers alike, owing to the Act on the extension of collective labour agreements. As has been established in additional analyses, both assumptions hold true: the coefficients of the price variable and the nominal wage variable become very insignificant and yield much smaller values than before the war (cf. van den Berg, 1995, p. 99).

It might still be possible, however, that people credit unions for an improvement in real wages (ΔRW_t), and think that joining a union increases its power and with that the chance that more wage growth can be realized. At the same time, this credit effect might have been mitigated by free-riding behaviour.

Concerning the impact of unemployment, there is no cause to assume another relationship with unionization than before the war. The same goes for the variables $Left_t$ and strikes.

The union density rate (D_{t-1}) will be included in linear and quadratic form, to test to what extent the Dutch trade union movement has experienced an enforcement and/or a saturation effect.

Finally, the variable SOC_t will enter the modelling to reveal if the growth in government expenditures on social benefits has really exerted a substitution effect on trade-union membership.

As becomes clear from table 2 below, the first equation obtaining all the theoretically relevant variables does not come up with only significant coefficients. Further variations in the model specifications, which are not shown here, indicate that the lagged unemployment variable as well as the lagged strike variable never yield significant parameters. Therefore, these two are left out in the

second equation. Although the first equation shows the expected signs with respect to the union density variables, their combined effect is not significant. Therefore the second equation only includes the density rate in linear form.

Interpreting the results of this second model, the following remarks can be made. Four out of the six variables appear to be quite robust. Contrary to the pre-war model, U_t is only significantly negative without a lag. This would imply that union members in an early stage decide to quit the union in times of unemployment. The fact that before the war members who lost their job received a (higher) unemployment benefit through their union, might explain why people renounced their membership at a later moment than they did after the war. The rather small coefficient value of -0.014 implies that a rise in unemployment by 10,000 persons decreases the union growth by 0.14%; so, only if unemployment increases dramatically will this have a serious effect on union membership. This was the case in the 1980s.

The outcome of the first model with respect to the union density rate tentatively suggests that there has been an enforcement effect as well as a saturation effect, but the rather low t-value make this interpretation unreliable. Including only D_{t-1}, yields a robust significant estimate with a negative sign, supporting the saturationist assumption: further growth of the union movement is hampered by its own size. This is quite remarkable, given the relatively low union density rate that the Netherlands have always had. This finding could be ascribed to the rather small recruitment efforts of Dutch unions as a result of the high degree of institutional security: they were accepted as negotiating and consultation partners at the macro and micro level anyway, irrespective of their size. Still, this result must be interpreted with caution because the union density rate shows a high degree of variation at the sectoral level.

Table 2. Determinants of union growth after the war (t-values in brackets)

		(1)	(2)
	adj. R^2	0.808	0.846
	D.W.	2.100	2.123
	root MSE	1.081	1.070
	# obs.	46	47
Constant		1.247	22.264***
		(0.078)	(5.858)
ΔRW_t	% change in real wages	0.125**	0.098*
		(2.283)	(1.970)
U_t	level of total	-0.016***	-0.014***
	unemployment (in 1,000's)	(5.552)	(3.188)
U_{t-1}	level of unemployment,	0.001	
	lagged by 1 year	(0.111)	
S_t	number of strikes	0.008	0.008
		(1.166)	(1.568)
S_{t-1}	number of strikes,	-0.007	
	lagged by 1 year	(1.286)	
$Left_t$	% share of Left in Parliament	0.223***	0.211***
		(2.969)	(2.989)
D_{t-1}	union density,	0.710	-0.634***
	lagged by 1 year	(0.748)	(9.177)
$(D_{t-1})^2$	union density, lagged	-0.020	
	by 1 year, squared	(1.463)	
SOC_t	social benefit payments	-0.185***	-0.160***
	as a % of nni	(3.482)	(3.229)

*significant at 10% level
**significant at 5% level
***significant at 1% level

Contrary to the pre-war model, the variable $Left_t$ now does seem to have been a stimulating determinant of union growth. The coefficient value of +0.21 implies that if the proportional share of left-wing parties in Parliament rises by 1%, this leads to an additional growth in union membership by 0.21%. This finding could be related to the increase of a general left-wing sentiment in Dutch society, which was also reflected in the fact that the Labour party was in power for about half the time since the war. More and more people sympathized with the ideas of the trade-union movement, which had also become less radical (at least as far as the largest federation, the NVV, was concerned).

The last robust finding concerns social benefit payments. The negative value of SOC_t shows that the extension of the social security system indeed caused a strong substitution effect. Since the liberation, social benefit payments increased from about 10% of the net national income to over 35%, a rise of 25%. The value of SOC_t is -0.16; this suggests that the growth of union membership now is 0.16 x 25% = 4% lower than would otherwise have been the case.

The remaining two variables in the second equation both appear to be slightly less influential. Firstly, the real-wage variable: although its coefficient does show a significant outcome, its value remains much lower than the value attained by the nominal wage variable in the pre-war model. This supports the surmise that the free-rider effect has reduced the credit effect of union bargaining.

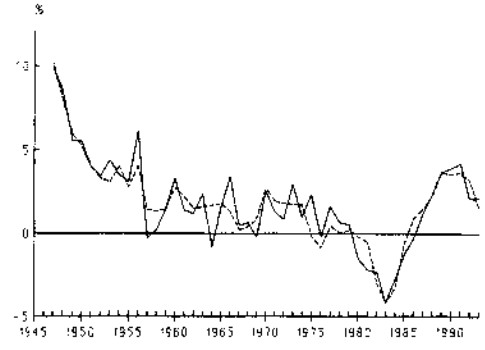
Secondly, contrary to the pre-war model, the strike variable now turns out to be positive if included without a lag; but its significance stays just below the 10% level. This rather weak result was more or less expected, because strikes organized by the recognized trade unions did not occur on a large scale after the second World War. It is interesting to note that if the members of the non-recognized federation EVC are included in the analysis, the strike variable has a much stronger, significantly positive value. This suggests that strikes have primarily influenced the

membership decision of workers opting for the EVC, the only federation that was actively involved in organizing strikes during the first post-war years.

This subsection is also brought to a close by presenting a graph which shows the closeness of fit of the post-war model.

A study of graph 3 reveals that the chosen model fits very well; only in three separate years do the actual and estimated values differ somewhat, namely in 1957/58 (when dissatisfaction about union policies led to a much smaller actual growth), in 1964 (probably for the same reason, but less clearly), and in 1975 (when the NVV as well as the government actively supported the interests of lower-paid workers, leading to membership growth). The model is not able to explain the distinct impact of specific union or government policies on union membership fluctuations.

Figure 3. Actual and estimated values of the rate of change in Dutch union membership after the second World War



___ actual values _ _ predicted values (based upon table 2, equation 2)

6. Conclusions

The objective of this paper was to give the historical description of developments in Dutch union membership: a quantitative underpinning by means of economic modelling. The data clearly

point to a structural break around the second World War, so that it is not possible to find a single relationship explaining the whole period.

Therefore, two sub-periods are analyzed instead of one. The very different outcome of the pre-war model as compared to that of the post-war model lends strong support to the decision to estimate the two sub-periods separately. Before the war, Dutch unionization was predominantly stimulated by price and nominal wage increases, and hampered by unemployment (although this increased the membership in the first instance) and by strike activities. After the war, unionization was stimulated by real-wage developments and by the impact of lef-wing political parties, while unemployment, the density rate and the rise in social benefit payments exerted a negative impact on union growth.

Many of the above-mentioned determinants are also cited in descriptive work by economic historians; the contribution of this study is that it enables us to pronounce upon the relative weight of each of the explanatory variables.

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APPENDIX

Table A

Union membership developments in the Netherlands 1910-1993 (based on end-of-year data)

year	ΔM_t*	year	ΔM_t	year	ΔM_t	year	ΔM_t
1910	27.6	1931	15.0	1952	3.4	1973	2.9
1911	6.2	1932	5.9	1953	4.4	1974	1.0
1912	8.3	1933	-4.3	1954	3.5	1975	2.3
1913	26.1	1934	-5.8	1955	3.1	1976	-0.2
1914	2.6	1935	-3.3	1956	6.1	1977	1.6
1915	10.7	1936	-0.5	1957	-0.3	1978	0.6
1916	18.8	1937	2.8	1958	0.2	1979	0.5
1917	19.9	1938	3.8	1959	1.4	1980	-1.5
1918	22.8	1939	3.9	1960	3.3	1981	-2.2
1919	33.3	1940	-9.6	1961	1.4	1982	-2.3
1920	-4.9	1941	-1.1	1962	1.2	1983	-4.1
1921	-2.6	1942	.	1963	2.4	1984	-2.8
1922	-11.1	1943	.	1964	-0.8	1985	-1.3
1923	-10.3	1944	.	1965	1.6	1986	-0.3
1924	-4.1	1945	.	1966	3.4	1987	1.2
1925	-0.7	1946	24.9	1967	0.5	1988	2.3
1926	2.3	1947	9.9	1968	0.7	1989	3.7
1927	3.2	1948	8.5	1969	-0.2	1990	3.9
1928	6.7	1949	5.5	1970	2.5	1991	4.2
1929	13.2	1950	5.5	1971	1.3	1992	2.1
1930	8.4	1951	4.1	1972	0.9	1993	2.1

Source: *CBS (1959), 60 jaren statististiek in tijdreeksen* (concerning 1910-1912);
J. Visser (1989), *European trade unions in figures* (concerning 1913-1941);
B.O. Ebbinghaus & J. Visser (1996), *Trade union systems in Western Europe; data handbook volume 1* (concerning 1946-1989).
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* $\Delta M_t = 00^* (M_t - M_{t-1})/M_{t-1}$

Table B

Simple statistics of the variables over two sub-periods

1900-1939

Variable	N	Mean	Std Dev	Min.	Max.
ΔM_t	32	6.44	11.00	-11.07	33.26
ΔP_t	39	0.91	6.26	-13.29	19.01
ΔW_t	29	4.21	12.29	-13.64	50.00
ΔRW_t	29	3.33	9.07	-8.41	37.58
U_t	29	222.27	191.88	23.00	601.40
D_{t-1}	26	28.44	5.87	16.87	38.63
$Left_t$	39	26.05	7.19	15.00	34.00
S_t	39	233.13	114.83	90.00	649.00
SOC_t	40	1.43	1.01	0.43	3.27

1946-1993

Variable	N	Mean	Std Dev	Min.	Max.
ΔM_t	48	2.34	4.28	-4.11	24.91
ΔP_t	48	4.58	3.15	-1.00	11.11
ΔW_t	48	7.60	4.77	0.54	16.67
ΔRW_t	48	2.71	3.71	-5.00	11.58
U_t	47	179.93	178.67	20.70	612.00
D_{t-1}	47	37.51	4.68	27.73	42.96
$Left_t$	48	39.40	4.13	34.00	46.70
S_t	48	57.29	57.72	8.00	272.00
SOC_t	48	21.63	10.20	4.20	35.66

Explanation of the symbols:

ΔM_t % change in membership

ΔP_t % change in consumer prices

ΔW_t % change in nominal wages

ΔRW_t % change in real wages

U_t level of unemployment (in 1,000's)

D_{t-1} lagged density rate

$Left_t$ % share of left in Parliament

S_t number of strikes

SOC_t social benefits as % of nni