Why union density has declined

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Abstract

In the Netherlands union density declined by a quarter between 1979 and 1987. In this paper we use two cross-sectional studies to analyze changes in individual decision making regarding union membership. By means of a decomposition analysis we determine to what extent changes in union membership can be attributed to changes in characteristics of the employed labor force and to what extent these changes are due to changes in behavior of the employed. The empirical findings show that approximately 60% of the decline is caused by changes in the population, while 40% is due to changes in unionization behavior. Our overall conclusion is that both arguments to explain the decline in union density have some validity, with the rising share of workers with a low propensity to join being slightly more important than the diminishing appeal of unions to workers.

Keywords: Union density; Growth accounting

JEL classification: J51

1. Introduction

One of the remarkable trends in labor market institutions in the 1980s has been the strong decline in unionization in most western countries. In the Netherlands union density declined by a quarter between 1979 and 1987, after which it stabilized. There have been several studies into the causes of this phenomenon, all

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of which use aggregate data to explain trends in the union membership rate (Schnabel (1987) for Germany, Booth (1983) and Carruth and Disney (1988) for the United Kingdom, and Fiorito (1982) and Stepina and Fiorito (1986) for the United States). Using time series for the Netherlands, Van Ours (1992) finds that 60% of the decline of union density in the 1980s can be attributed to the decline in the labor income ratio and about 40% to the growth of unemployment.

A drawback of these studies based on aggregate data is that they cannot relate developments in union membership to individual behavior. After all, with the exception of closed shops, the decision to join a union is a matter of individual choice; at least, it is in the Netherlands. In this paper we take a different approach. We use a time-series of cross-sections to analyze changes in individual decision making regarding union membership.

Generally two arguments are put forward to explain the decline in union density. The first stresses the increase in the labor force of employees with a low propensity to join a union. An example of this argument is the rising share of women in the labor force, who are traditionally less organized than men. The second argument stresses that unions have lost their appeal to workers. Aim of this paper is to ascertain the validity of these two arguments. Therefore we decompose the change in the union membership rate into changes in observable characteristics of the employed labor force and in changes in behavior. For this analysis we use two cross-sectional surveys for the years 1979 and 1987, which cover the period of union decline exactly.

In Section 2 we describe some of the socio-economic developments which coincided with the decline in union membership. The decomposition method used in the empirical analysis is described in Section 3. The data used in the empirical analysis are described in Section 4, while Section 5 discusses the results of the empirical analysis. The last section concludes.

2. Some socio-economic developments in a period of union decline

Until the end of the 1970s the Dutch trade union movement experienced an almost uninterrupted period of growth, but between 1979 and 1985 the total union

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1 With the exception of a part of the printing industry, there are no closed shops in the Netherlands.

2 In the Netherlands, individuals can usually choose between several unions in their branch of industry. Recognition status is not really an issue. All firms and trade unions have the right to bargain over the terms of employment, and this usually takes place at industry-level. As soon as an employer (or his organization) reaches a bargaining agreement with one or more of the operating unions, this labor contract – by law – applies to all workers in the pay of this employer, members and non-members alike. Moreover, if the employees of the firms subscribing to the agreement make up a substantial part of that industry, the government can extend this agreement to the entire industry. For more details, see our (1992) paper.
Table 1
Total union membership (in 1000’s) and density rates \(^a\), 1979–1987

<table>
<thead>
<tr>
<th></th>
<th>Men</th>
<th></th>
<th>Women</th>
<th></th>
<th>Total</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Absolute</td>
<td></td>
<td>Density rate</td>
<td></td>
<td>Absolute</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>1979</td>
<td></td>
<td>1,555.9</td>
<td>44</td>
<td>48</td>
<td>236.0</td>
<td>16</td>
</tr>
<tr>
<td>1981</td>
<td></td>
<td>1,491.7</td>
<td>41</td>
<td>46</td>
<td>245.2</td>
<td>15</td>
</tr>
<tr>
<td>1983</td>
<td></td>
<td>1,407.8</td>
<td>38</td>
<td>45</td>
<td>238.2</td>
<td>13</td>
</tr>
<tr>
<td>1985</td>
<td></td>
<td>1,310.9</td>
<td>35</td>
<td>41</td>
<td>229.9</td>
<td>12</td>
</tr>
<tr>
<td>1987</td>
<td></td>
<td>1,306.1</td>
<td>34</td>
<td>39</td>
<td>247.6</td>
<td>12</td>
</tr>
</tbody>
</table>

\(^a\) 1 = union members younger than 65 as a percentage of the dependent labor force; 2 = union members younger than 65 as a percentage of the working population (see footnote 4)


Membership showed a steady decline. However, in the two successive years the membership rates have stabilized. In the period 1979–1987 the union density rate \(^3\) decreased by a quarter, from 40 to 30.

As can be seen from Table 1, the decline in absolute numbers was largest among male members, but looking at density rates, female membership decreased most.

The causes of these trends are diverse, although some people tend to blame this union decline entirely on the economic recession and its attendant strong rise in unemployment. However, several structural developments obstructing union growth must also be taken into consideration, such as the composition of the workforce. In view of the fact that in the Netherlands unions’ bargaining efforts accrue to members and non-members alike, one could wonder why people join a union at all. Important motivations are the (legal) services that unions provide to their members, pressure from someone’s social environment, and feelings of solidarity.

The determining factors are subdivided into four groups: personal characteristics, occupational and industry characteristics, wage related variables and regional characteristics. In a previous paper (Van den Berg and Groot, 1992) we discussed

\(^3\) The union density rate can be defined in a number of ways. Here we distinguish two definitions. First: the number of union members younger than 65, as a percentage of the dependent labor force, which in turn is defined as the sum of wage earners (including part-timers) and people who are looking for a job. Second: the number of union members younger than 65, as a percentage of the working population (i.e. wage earners only); until 1983, only people working at least 15 hours per week were included, thereafter all part-timers are included. The Central Bureau of Statistics uses a definition in which the number of union members younger than 65 is divided by the dependent labor force with a full working-week. We deviate from this definition, since our empirical analysis is based on a sample of part-timers and full-timers together.
all possible variables at length. Here we shall confine ourselves to those variables that are used in this empirical study.

2.1. Personal characteristics

All empirical studies find that being a woman reduces the probability of union membership. This is probably to a great extent caused by a weaker labor force attachment of women, but it is also argued that the lower rate of female membership is due to the fact that women tend to work in the less-organized sectors of the economy (Bain and Price, 1983; Freeman and Medoff, 1984). However, see Booth (1986) for different results on the U.K.

Between 1979 and 1987 the share of women in the Dutch workforce shows a steady rise. Their share in union membership also increased, but at a lower pace (an increase of 25.6% in women’s share in the workforce against a 21% rise in the share in union membership). The proportion of women in unions is far below their proportion in the labor force, and this gap has only widened in the period under consideration.

Another adverse trend can be found in the ‘ageing’ of the union members. People below the age of 25 constitute a slightly declining portion of the total labor force. At the same time their share in total union membership has declined much more rapidly. The share of younger workers in unions is far less than their share in the labor force.

According to Fiorito and Greer (1982), “evidence suggests that employees with greater family responsibilities are more likely to favor unions”. To verify this, marital status and number of children will be taken into account.

Although the secularization has gone quite far in the Netherlands, statistics (CBS, 1989) show that officially more than 60% of the population belongs to one of the three main denominations. Further, the main Christian political party (and its predecessors) has been in government since the end of World War I. This may indicate that, in spite of the secularization, religion might play a role in the decision to join a union.

Contrary to time-series studies, cross-sectional analyses do not pay much attention to the relationship between political preferences and union membership (Kornhauser, 1961; Schippers, 1986). Our data set only gives information about whether one is a member of a political party at all. It could be argued that people who are more socially active in general, are more inclined to become a union member than ‘socially passive persons’. This would imply that the decrease in members of political parties has contributed to the decline of unions.

Concerning the level of education, the theory assumes that higher educated workers are less likely to join the union (Farber and Saks, 1980; Bain and Elias, 1985). The educational level of the labor force has increased steadily in the last decade. This would imply a negative impact upon unionism. However, in Van den Berg and Groot (1990) it was found that in the Netherlands more schooling has a
significant *positive* effect on membership, which might be explained by the fact that in this country several unions operate especially for the promotion of interests of the higher personnel.

### 2.2. Occupational and industrial characteristics

The effects of the sectoral shift in employment have received a lot of attention in the literature. Van Ours (1992) finds no impact of changes in the industry structure on Dutch union membership. However, Visser (1987) calculates that about one third of union decline in the Netherlands is caused by the changing sectoral structure.

Traditionally, the union movement had its stronghold in the industrial sector. However, during the past two decades employment in the industrial sector has been dwindling, and so has the union membership rate.

Table 2 denotes which proportion of the total *working* population is employed in each of six sectors of industry, set against the proportional distribution of the *working* union members in these sectors. From the table we can draw conclusions on union ‘over’- and ‘under’-representation. For example, it shows that in

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4 Retired, unemployed and occupational disabled workers and union members are excluded.
1979 36.8% of all employees worked in the industrial sector, while 41.8% of all working union members had a job in this sector. This indicates that the union density rate of employees in the industrial sector is higher than average. Sectors with an overrepresentation of unionized workers are: the industrial sector, transport sector and the public sector. Unions are underrepresented in the service sector at large, which is here subdivided into trade, hotel and catering industry ('service sector') and the banking and insurance sector ('finance sector').

In addition, Table 2 shows the very fast rising share of non-working union members.

The standard average working week has decreased from 40 to 38 hours, and in some branches to 36 hours in the last decade. Moreover, the number of part-time jobs increased tremendously in a very short period. Especially this last development is regarded as unfavorable to union growth, since part-time jobs lead to a lower labor force attachment and hence to a lower propensity to join a union (Antes et al., 1980; Bain and Price, 1983).

2.3. Wage related variables

The effect of the level of earnings upon union membership has been studied a great deal (see Hirsch and Addison (1986) for references). Although the findings are somewhat mixed, one could argue that lower-income workers have more need of a union than high-income workers. Bain and Elias (1985), and Van den Berg and Groot (1992) have found a parabolic relationship: the probability of unionization first increases with earnings, and after a certain level it decreases again. As the wage level rises, the costs of membership in the form of union dues often tend to decrease as a proportion of income. But after a certain level, the risk of employer opposition also increases. Besides, higher salaried employees usually have less interest in union policy to reduce the dispersion of earnings and to moderate the wages demand in order to fight unemployment.

In the Netherlands, the rise in the average level of real earnings has slowed down between 1979 and 1983, but has recovered afterwards (source: CPB, 1980–1988). In a downward phase, one could either expect this to have a negative effect, if workers blame the union for not maintaining their standard of

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5 In 1979 17% of all jobs were part-time jobs (with a working week of less than 35 hours), and in 1987 this had risen to 31.1% (Source: Ministry of Social Affairs and Employment, 1985, 1989).

6 In the Netherlands, a union–nonunion wage differential does not exist. All workers, whether members or not, benefit from the unions' bargaining efforts (see also footnote 3). It can of course be argued that there is a union markup on wages in the sense that workers receive more than they would have received in the absence of union representation. As all collective wage agreements are bargained by unions, it is impossible to establish how large this markup is. Alternatively, one could look at within industry union density as an indicator of union bargaining power. However, a simple OLS wage equation with union density as an explanatory variable, reveals that workers in higher organized industries earn significantly less than workers in less organized industries.
living, or a positive effect if workers join the union to improve their standard of living.

2.4. Regional characteristics

It is often reported in American studies, that unionization rises with the degree of urbanization (see Fiorito and Greer (1982) for references). A higher concentration of the work force not only lowers the costs of union organization, but also promotes the so-called 'proximity influence' (i.e., workers stimulate each other to join the labor movement) and enlarges the bargaining power of the trade unions. In the Netherlands, large areas are heavily urbanized. Between 1979 and 1987, not much has changed in the regional distribution nor in the rate of urbanization.

3. Empirical analysis

Changes in union membership can be caused by changes in observable characteristics of employees and by changes in behavior (i.e. the propensity to join a union). Assume that the relation between (a vector of) observable characteristics of workers \( x_i \) and membership \( y_i \) in year \( i \) can be expressed as

\[
y_i = \beta_i x_i + \varepsilon_i, \tag{1}
\]

where \( \beta_i \) is a vector of coefficients and \( \varepsilon_i \) is an identically and independently distributed error term. Changes over time in \( y_i \) can be due to changes in the characteristics \( x_i \) and/or to changes in the associated parameters \( \beta_i \). Stoker (1985) has developed a framework for decomposing a change of an aggregate variable into a change of the behavioral model and a change in distribution of the characteristics. Gomulka and Stern (1990) apply this method for decomposing a binary dependent variable.

Assume that \( \varepsilon_i \) is normally distributed. The probability of being a union member in year \( i \) (\( y_i = 1 \)) conditional on the observed characteristics \( x_i \) is

\[
Pr(y_i = 1 | x_i) = P(\beta_i x_i). \tag{2}
\]

This is the probit model.

The change in the average probability of union membership between year \( i \) and year \( j \) can be decomposed as (cf. Gomulka and Stern (1990))

\[
P^a(\beta_j x_j) - P^a(\beta_i x_i) = \left\{P^a(\beta_j x_j) - P^a(\beta_i x_i)\right\}
+ \left\{P^a(\beta_i x_i) - P^a(\beta_i x_j)\right\}, \tag{3}
\]

where \( P^a(\beta_i x_j) \) is the average predicted probability of union membership using characteristics \( x_j \) and coefficients \( \beta_i \). The first term in braces in Eq. (3) describes the change in the average probability due to changes in the coefficients. The
second term gives the contribution of a change in the distribution of the characteristics to the change in the average probability of union membership.

To find the contribution to the change in average union membership probability of each coefficient separately, we can further decompose the first term in Eq. (3):

\[
P^a(\beta_j x_j) - P^a(\beta_i x_j) = \left\{P^a(\beta_j x_j) - P^a(\beta_i^k x_j)\right\} + \left\{P^a(\beta_i^k x_j) - P^a(\beta_i x_j)\right\},
\]

where \(\beta_i^k\) is the \(k\)th coefficient.

First we predict union membership using the sample and the coefficients of years \(j\). This yields \(P^a(\beta_j x_j)\). Next, we take all coefficients of year \(j\) except for the \(k\)th coefficient for which we take the year \(i\) value. With this set of coefficients we can again predict union membership. This yields \(P^a(\beta_i^k x_j)\). Taking the difference between \(P^a(\beta_j x_j)\) and \(P^a(\beta_i^k x_j)\) gives the contribution of the \(k\)th coefficient in year \(i\) to the change in union membership.

Besides decomposing the changes in the average union membership probability into a ‘coefficient effect’ and a ‘variable effect’, we may also test for parameter equality between year \(i\) and year \(j\). This comes down to a test on \(\beta_i = \beta_j\). Rejection of this test indicates a structural change. By performing an equality of parameter test for each of the coefficients separately, structural changes in the marginal contribution to the probability of union membership of each of the variables can be established. The equality of parameter tests are carried out by likelihood ratio tests.

4. The data

The data sets used are the Supplementary Provision Surveys (SPS) of 1979 and 1987 (Aanvullend Voorzieningengebruik Onderzoek, 1979 and 1987) of the Dutch Social and Cultural Planning bureau. The SPS is a random national cross-sectional survey. Both samples consist of over 12,000 individual observations, from which we have taken sub-samples of employees; 5,642 (1979) and 5,350 (1987) observations could be used.

The exogenous variables in the union membership equation include gender (1 = male; 0 = female), marital status (1 = married; 0 = otherwise), number of children, age, years of education, and political party (1 = member; 0 = otherwise). We also included four dummy variables for religious denomination: Roman Catholic, Reformed, Protestant, and Other. A dummy indicating whether the individual considered him/herself a ‘humanist’ was incorporated as well.

Inter-industry differences in unionization are captured by five dummy variables for the branch of industry in which the employee works: agricultural, service, transport, finance, and public sector. The reference group consists of workers in

the industrial sector. Furthermore, the number of hours worked and a variable indicating the number of subordinates of the individual are included. Unfortunately, the data set does not contain any other industry- or plant-specific variables.

Wage related variables are covered by net monthly household income and net household income squared, and the money value of the fringe benefits. Finally, regional differences in union membership are captured by four variables for the region in which the individual lives (the North, the South, and two separate provinces 7) and a dummy variable for the degree of urbanization (1 = cities of over 30,000 inhabitants; 0 = otherwise).

From the data it emerges that the union participation rate has declined from 31.4% in 1979 to 26.4% in 1987; a decline of 5 percentage-points. These figures are lower than the density rates mentioned in Table 1. This is partly the result of our selection criteria. In the last column of Table 1 all union members younger than 65 are taken as a percentage of the working population. Because we left out all non-working persons, our density rate in the sample is defined as the number of working union members younger than 65, as a percentage of the working population (i.e. the whole sample).

Further we note that the share of women and single persons in the employed labor force has increased, and that the average hours of work has strongly declined. The share of the industrial sector in total employment has decreased with no fewer than 10 percentage-points between 1979 and 1987, while the service and finance sector have greatly expanded. The average net nominal household income rose about 30% over the whole 8-year period, but if we correct this by the CBS price index of household expenditures, real income has increased with 7%.

5. Empirical results

Table 3 contains the parameter estimates. In both years men and those who are member of a political party have a higher probability of being a union member than women and those who are not a member of a political party. Being a Catholic or of another religious conviction lowers the chance of union membership. The same holds for the number of children, contrary to what theory predicts. Further, the probability of union membership rises with age, education, and the number of hours of work in both samples. The industry dummies all are highly significant and show that workers in the transport and public sector are more highly organized, while workers in the agricultural, commercial services, and banking

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7 The North is the provinces Groningen, Friesland and Drente; the South is the provinces Zeeland, Noord-Brabant and Limburg. The provinces Overijssel and Gelderland are taken separately, because it was empirically not possible to fit them in one of the other two regions.
Table 3
Parameter estimates of the explanatory variables (t-values in brackets)

<table>
<thead>
<tr>
<th></th>
<th>1979</th>
<th>1987</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Personal characteristics</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Intercept</td>
<td>-2.247 c</td>
<td>-2.299 c</td>
<td>(11.492)</td>
</tr>
<tr>
<td>Gender</td>
<td>0.465 e</td>
<td>0.341 c</td>
<td>(6.394)</td>
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<tr>
<td>Marital status</td>
<td>0.090 a</td>
<td>0.075</td>
<td>(1.533)</td>
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<tr>
<td># children</td>
<td>-0.039 c</td>
<td>-0.038 b</td>
<td>(2.124)</td>
</tr>
<tr>
<td>Protestant</td>
<td>-0.070</td>
<td>-0.184 c</td>
<td>(3.176)</td>
</tr>
<tr>
<td>Reformed</td>
<td>-0.032</td>
<td>0.017</td>
<td>(0.219)</td>
</tr>
<tr>
<td>Roman Catholic</td>
<td>-0.182 c</td>
<td>-0.136 c</td>
<td>(2.669)</td>
</tr>
<tr>
<td>Humanist</td>
<td>-0.042</td>
<td>-0.011</td>
<td>(0.061)</td>
</tr>
<tr>
<td>Other religions</td>
<td>-0.256 c</td>
<td>-0.320 c</td>
<td>(2.942)</td>
</tr>
<tr>
<td>Age</td>
<td>0.016 c</td>
<td>0.019 c</td>
<td>(8.984)</td>
</tr>
<tr>
<td>Years of education</td>
<td>0.028 e</td>
<td>0.017 b</td>
<td>(2.014)</td>
</tr>
<tr>
<td>Political party</td>
<td>0.365 c</td>
<td>0.458 c</td>
<td>(5.774)</td>
</tr>
<tr>
<td></td>
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<tr>
<td><strong>Occupational characteristics</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td># hours worked</td>
<td>0.014 c</td>
<td>0.012 c</td>
<td>(4.942)</td>
</tr>
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<td>Manager</td>
<td>0.001</td>
<td>-0.000</td>
<td>(0.312)</td>
</tr>
<tr>
<td>Agricultural sector</td>
<td>-0.429 c</td>
<td>-0.209 b</td>
<td>(2.241)</td>
</tr>
<tr>
<td>Service sector</td>
<td>-0.545 c</td>
<td>-0.324 c</td>
<td>(5.019)</td>
</tr>
<tr>
<td>Transport</td>
<td>0.179 b</td>
<td>0.255 c</td>
<td>(3.036)</td>
</tr>
<tr>
<td>Finance sector</td>
<td>-0.388 c</td>
<td>-0.358 c</td>
<td>(4.671)</td>
</tr>
<tr>
<td>Public sector</td>
<td>0.092 b</td>
<td>0.152 c</td>
<td>(2.834)</td>
</tr>
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<tr>
<td><strong>Wage-related variables</strong></td>
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<tr>
<td>Household inc./100</td>
<td>0.012</td>
<td>0.011</td>
<td>(1.480)</td>
</tr>
<tr>
<td>Household inc.^2/1000</td>
<td>-0.000</td>
<td>-0.000 a</td>
<td>(1.879)</td>
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<td>Fringe benefits/100</td>
<td>-0.055 a</td>
<td>0.026</td>
<td>(0.758)</td>
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<tr>
<td><strong>Regional characteristics</strong></td>
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<tr>
<td>Urbanization</td>
<td>-0.120 c</td>
<td>-0.029</td>
<td>(0.682)</td>
</tr>
<tr>
<td>Northern provinces</td>
<td>0.132 b</td>
<td>0.153 b</td>
<td>(2.248)</td>
</tr>
<tr>
<td>Southern provinces</td>
<td>-0.090 a</td>
<td>0.027</td>
<td>(0.484)</td>
</tr>
<tr>
<td>Province Overijssel</td>
<td>-0.047</td>
<td>0.019</td>
<td>(0.250)</td>
</tr>
<tr>
<td>Province Gelderland</td>
<td>0.095</td>
<td>0.132 b</td>
<td>(2.014)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Loglikelihood</td>
<td>-3147.46</td>
<td>-2840.75</td>
<td></td>
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<tr>
<td>Pseudo $R^2$</td>
<td>0.12</td>
<td>0.09</td>
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<tr>
<td>Correctly predicted</td>
<td>0.70</td>
<td>0.74</td>
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</tr>
</tbody>
</table>

* Significant at 10% level.

b Significant at 5% level.

c Significant at 1% level.
sector are less frequently organized than workers in the industrial sector. Finally, living in one of the northern provinces increases the probability of union membership.

Some variables have a significant effect in one year but not in the other. For 1987 we find a significant negative effect of being Protestant, but not for 1979. The variable 'urbanization' only has an effect in 1979. The sign of this effect is negative, indicating that workers living in large cities are less organized. This refutes the so-called 'proximity' hypothesis. Overall, the wage-related variables performed rather poorly.

In Table 4 the results for the decomposition of the change of the union membership probability into a 'variable effect' and a 'coefficient effect' are presented. The diagonal elements give the average predicted probability using coefficients and sample of the same year. The mean predicted probabilities correspond quite closely to the actual proportion of union members in each year. The columns of Table 4 give the variable effect, while the rows give the coefficient effect. From Table 4 it emerges for example that if the characteristics of the workers in 1987 had been those of 1979, the operative model in 1987 would have predicted union density to be 28.7%. If the operative model in 1987 had been equal to the one in 1979, union membership among employees in 1987 would have been 28.0%.

The total decline in union density between 1979 and 1987 was 5 percentage-points. If we look along the rows of Table 4, we can get an estimate for the decline in union density due to changes in the coefficients, reflecting changes in unionization behavior. We can see that approximately 1.5 to 2.6 percentage-points of the decline in union density are due to changes in the model structure.

The columns show the change in union density due to changes in the distribution in characteristics in the sample. About 2.2 to 3.5 percentage-points of the decline in union density can be attributed to changes in the workforce.

So, we may conclude that the contribution of changes in behavior of employees
to the decline in union density is somewhat less than the contribution of changes in the characteristics of the work-force: approximately 60% of the 5 percentage-point decline in union density can be said to be caused by changes in the population, while 40% is due to changes in unionization behavior.

In this table the null-hypothesis of this $t$-test is that the mean predicted probability of union membership in the sample of year $i$ using the coefficients of year $j$ is equal to the mean predicted probability using both the sample and the coefficients of year $i$. The $t$-values are significant at the 1% level, indicating significant differences in the mean predicted probability of union membership.

The last row of Table 4 gives the skewness of the distribution of the predicted probabilities of union membership using the sample and coefficients of the same year. In both years the distribution of predicted probabilities is skewed to the right, implying that there is a hump of observations in the left tail of the distribution. So, more than 50% of the employees in the sample have a predicted probability of being a union member that is less than the average probability. This suggests that a large fraction of the employees has a very small chance of being a union member.

The right skewness increases over the years. This implies that the fraction of employees with a low probability of being a union member has been rising, which is an indication of the diminishing appeal of union membership.

To determine which variables in the model carry the most weight, we also estimated the mean predicted probabilities of a change in the coefficients separately. The most interesting results can be found in Table 5. Columnwise characteristics remain unchanged, but the separate coefficients vary (only one at a time). The upper left and lower right segments give the mean predicted probabilities of union membership using both the sample and the coefficients of the same year. We only report results for variables that show a marked effect.\footnote{Other results are available from the authors on request.}

If we look columnwise along Table 5, we see a decrease in predicted union

---

**Table 5**

<table>
<thead>
<tr>
<th>Sample</th>
<th>Coefficients 1979</th>
<th>Coefficients 1987</th>
<th>Sample</th>
<th>Coefficients 1979</th>
<th>Coefficients 1987</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>1979 31.3</td>
<td>1987 28.2</td>
<td>Education</td>
<td>1979 31.1</td>
<td>1987 27.2</td>
</tr>
<tr>
<td>Age</td>
<td>1979 31.1</td>
<td>1987 34.4</td>
<td>Industry</td>
<td>1979 31.1</td>
<td>1987 33.0</td>
</tr>
<tr>
<td></td>
<td>1987 23.5</td>
<td>1987 26.4</td>
<td></td>
<td>1987 24.4</td>
<td>1987 26.4</td>
</tr>
<tr>
<td>Earnings</td>
<td>1979 31.1</td>
<td>1987 32.2</td>
<td>Region</td>
<td>1979 31.1</td>
<td>1987 35.2</td>
</tr>
<tr>
<td></td>
<td>1987 24.9</td>
<td>1987 26.4</td>
<td></td>
<td>1987 23.8</td>
<td>1987 26.4</td>
</tr>
</tbody>
</table>
membership for all six variables. This indicates that for each of these characteristics—gender, age, earnings, education, industrial composition, and regional composition—the population structure has become less favorable to union membership.

The changes in the model structure are not all in the same direction, as can be seen if we look along the rows. Some effects are positive to union membership, others are negative. Responsible for a decline in membership are the coefficients for gender and for education. From this we may conclude that the propensity of males and the propensity by educational level to join a union has declined. The effects of age, earnings, industry and region on union membership have become more positive. Within these last two categories, the variables that contribute most to this positive trend are: the service and public sector on the one hand, and the southern provinces and the urbanization dummy on the other.

Next, we have tested for overall parameter stability by a likelihood ratio test. For this purpose we re-estimated our model on the pooled 1979/1987 data. The value of the likelihood ratio test is 36.6, implying that the null-hypothesis of total parameter stability between 1979 and 1987 cannot be rejected.

We also looked at the stability of the parameters separately. Some variables have been reduced to the same denominator. Marital status and number of children is 'family structure', the five religious variables are 'religion', the five employment sectors are 'industry', the three income variables are 'earnings' and finally the five regional characteristics are 'region'. The likelihood ratio test statistics show that especially the coefficients of gender and of the industry variables have changed significantly over the period, next to the coefficients of religion, age, education, and earnings.

6. Conclusion

Between 1979 and 1987 the union density rate in the Netherlands decreased. In this paper some probable causes of this decline have been investigated. For this the change in the union membership rate has been decomposed into changes in observable characteristics of the employed labor force and in changes in behavior.

We expect that this decline could partly be explained by the rising share of female and part-time employment, the waning interest of younger workers to join a union, and the sectoral shifts in employment from industry towards the service sector. There are also some developments in favor of unionization to be expected, especially the growth of the public sector. Most of these expectations are confirmed in our analysis.

Aim of the paper is to ascertain to what extent the decline in union density is

\[9\text{The value of the log likelihood function for the pooled sample is } -6000.51.\]
caused by an increase in the share in the employed labor force of employees with a low propensity to join and to what extent by a diminishing appeal of unions to workers. The empirical analysis shows that approximately 60% of the decline in union density is caused by changes in the population, while 40% is due to changes in unionization behavior. From the skewness of the predicted distribution of union density it is concluded that the appeal of unions to employees has decreased over the years.

Our overall conclusion is that both arguments to explain the decline in union density have some validity, with the rising share of workers with a low propensity to join being only slightly more important than the waning attraction of unions to workers.

References

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