

Spatial Variations in Inflow Rates of Unemployment in the Netherlands

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There are significant spatial variations in inflows and outflows of unemployment in the Netherlands. In the present paper an attempt is made at providing an explanatory framework for differences in (male) unemployment inflow rates for Dutch provinces. This partial analysis of spatial differences in unemployment uses a multiple regression analysis to identify the relative importance of various explanatory factors affecting the unemployment inflow. The results are compared with a similar study for Great Britain, and it follows that for both countries demand-side factors appear to be major explanatory variables. For the Netherlands, the number of vacancies relative to the regional labor force shows up as an important indicator of demand effect on unemployment inflow.

The dramatic growth of unemployment in the Netherlands (especially during the beginning of the 1980s) has led to a large pool of unemployed, which turned out to be very persistent in size over the past years. Even though economic conditions improved somewhat in the mid 1980s, the stock of unemployed in absolute size hardly shrank. It is a surprising phenomenon, however, that this fairly constant level of unemployment occurred despite an increasing outflow of unemployment. Apparently, the number of people entering the state of unemployment did not decrease below a significant level, which was approximately equal to the number of people leaving the stock of unemployed. The Dutch government developed several labor market programs, most of them aiming at improving the re-employment possibilities of the long-term unemployed; for example, by means of wage subsidies and educational training programs.

However, a balanced labor market policy does not only need a focus on the re-employment probabilities, but also needs to focus on the probability of becoming unemployed (i.e., on preventive measures). Research into the

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nature and determinants of inflow rates is fairly rare, although such insight is useful for the development of an adequate remedial policy for the problem of unemployment because the inflow is (clearly) the origin of a mismatch on the labor market. Empirical observation points also to the existence of a considerable variation in inflow rates between different types of workers and between different labor market areas (see also Fischer and Nijkamp, 1988). Specifically, the spatial dimension of this phenomenon has hardly been investigated.

Therefore, a particular aspect of the unemployment rate and its spatial diffusion, namely *the unemployment inflow*, will be discussed in this paper. This partial, but nevertheless important, analysis may shed light on the contribution of the inflow component to the size of regional unemployment. It may also provide insight into the underlying causes of the spatial differences in unemployment rates due to differences in the unemployment inflow.

The paper is subdivided into four sections. In the first section, we briefly consider some possible explanations of the phenomenon of regional unemployment and its spatial differentiated pattern. Also, the relevance of a separate analysis of spatial differences in the components of unemployment (inflow and duration) is discussed.

A descriptive analysis of data on the inflow of unemployed males in the Netherlands is presented. First, we make a classification of components of unemployment inflow from a theoretical point of view. Secondly, the regional unemployment inflow is compared with unemployment itself and the second important component of unemployment, viz. the duration. Finally, the inflow data is studied from the viewpoint of the nature of the region in terms of economic importance for the national economy.

In the next section, the regional differences responsible for the differences in unemployment inflow rates are further examined. Following the approach of Armstrong and Taylor (1985)—who did a similar analysis for Great Britain—we are able to verify the validity of their results for the Netherlands. The approach is based on a multiple regression model including variables that may be attributed to demand- and supply-side influences. In the final section, we draw some conclusions.

REGIONAL DIFFERENCES IN THE UNEMPLOYMENT RATE

The persistently high level of unemployment in the Netherlands is caused by a combination of influences, notably the lack of demand, the lack of international competitiveness, the problems of adjustment to structural change, and the shifts in labor supply.

The “burden” of unemployment is clearly unequally distributed over individuals and regions. The main causes for the spatial variations in unemploy-

ment rates are spatial differences in: job creation, job redundancy, occupational structure, commuting and migration patterns, and participation in the labor force. These factors, together with personal characteristics, determine the chances for people to get and maintain a job in a certain region.

Conventional neo-classical theory predicts that in the long run labor flows will adjust and thus eliminate the differences in unemployment. The real wage would work as a signal of regional labor market conditions. In the case of excessive regional demand, the real wage would rise, while in the case of unemployment the real wage would fall. In reality, however, the price mechanism does not work in the Netherlands: interregional wage differences are very small.

There may be many causes for the occurrence and persistence of unemployment, which will not be discussed at length here. We only briefly mention some possible causes of disequilibrium on the labor market—viz. wage rigidity, immobility and imperfect information.

However, in this article our interest lies in the explanation of *regional differences in unemployment*. Two different schools of thought can be found on the subject of regional unemployment disparities (see Fischer and Nijkamp, 1989).

- 1) The aggregate demand pressures are unevenly distributed across the space economy.
- 2) The historically determined spatial division of labor plays an important role.

Depending on which view is believed to be true, indicators of regional demand or supply have to be identified in order to examine their effects on regional unemployment. It is, of course, also possible that both views are true.

In our approach to studying spatial differences of unemployment, we do not concentrate on the differences in the unemployment rate itself. Alternatively, we look at the two dynamic components of unemployment: inflow and duration. This makes it possible to examine the spatial differences of each component separately. The spatial variation in the components inflow and duration may in fact be quite different from the variation in the unemployment rate itself. In addition, the underlying factors causing the differences in the inflow rate and the duration of unemployment do not have to be the same (see for example Nickell, 1982).

In this article, the main focus is on the differences in unemployment inflow rates. An explanatory analysis of the duration of regional unemployment for the Netherlands at the provincial level was done by Folmer and van Dijk (1988) and Gorter et al. (1990). The conclusion of the latter analysis of spatial variation in regional unemployment duration was that regional demand (measured by means of the vacancy rate) plays an important role

and that the impact of supply-side factors (measured by the age/occupational/educational structure of the labor force) was limited. In contrast, Folmer and van Dijk (1988) found that differences in the duration of unemployment are mainly caused by personal characteristics and that the structure of the regional economy, viz. the regional demand for labor, is of minor importance. Although these findings indicate the need for more rigorous empirical research on the effect of the regional economy on the duration of unemployment, research on the other component of unemployment (i.e., the inflow) should not be neglected.

Therefore, the spatial differences in the unemployment inflow rates are examined as a central research issue here. An attempt is made to identify the underlying causes of the observed differences in order to get more insight into the process of becoming unemployed. It was already mentioned in the introduction that this is of particular interest for the development of an adequate policy for the unemployment problem, because the inflow is the origin of the problem.

THE UNEMPLOYMENT INFLOW DATA

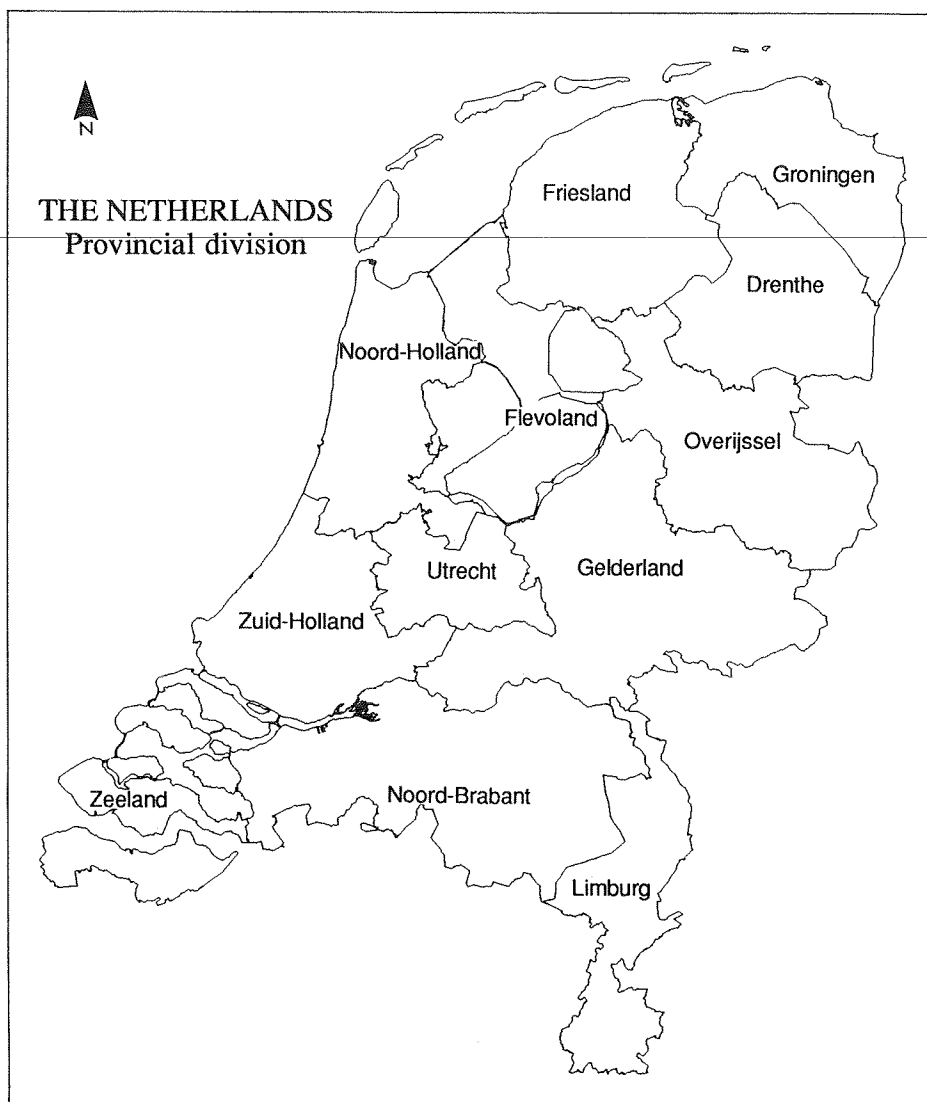
First, we mention the possible sources of inflow into the state of unemployment. Four possible categories of flows can be distinguished:

- 1) New persons entering for the first time into the labor force and registering as unemployed. This category will primarily consist of young people, who have finished their education and are unable to immediately find a job.
- 2) Workers laid off permanently by their employers. The main part of this inflow is probably caused by mass firing (e.g., firms closing down because of a bankruptcy). In addition, there are workers fired individually.
- 3) Workers voluntarily quitting their job. It does not seem plausible that this type is a main part of the aggregate flow into unemployment under the current socio-economic conditions in the Netherlands.
- 4) The flow from "out of the labor force" to the stock of unemployed. This category consist of people who were absent from the labor force for some period (because of illness, maternity leave or activities in the household) and are now willing to work again but are unable to find a job and thus enter the stock of unemployed.

Ideally, we would know the volumes of each of these four flows within and between each regional labor market, which would make it possible to determine which labor market process would dominate in these regions. Consequently, we would then know on which type of worker to concentrate unemployment policies in order to minimize the unemployment inflow. For

example, if the intraregional flow into unemployment is largely caused by first-time entrants, then one might suggest the adjustment of the educational programs in order to achieve a better match with the wishes of employers. Alternatively one might advocate the creation of new jobs for young people with a lower educational level.

Figure 1: Location of the Dutch provinces.



Unfortunately, we do not have data on the sources of inflow on a regional level.¹ Therefore, we have to investigate the differences in regional unemployment inflow rates in an alternative way; for example, by comparing regional characteristics (see also Section 2). This approach will be followed in this paper by specifying a multiple regression model in which the regional unemployment inflow rate is explained by economic and demographic characteristics of the region. In order to estimate this model, data will be needed on unemployment inflow rates and the relevant explanatory variables on the regional level. This kind of data is (directly or indirectly) available for the Netherlands on the provincial level (Figure 1). This implies, however, that the sample size of a cross-section regression analysis would become very small. Hence, we will use a pooled cross-section time-series data set on the basis of annual data on the provincial level for the period 1985-1988.

Since data on flows are not available in the Netherlands in the period before 1987, we have used a method to estimate them (on the basis of stock data) in an indirect way. In this method, the data is approximated on the basis of the inflow into the unemployed stock during the period of one month (Gorter et al, 1990). In the approximation process, an adjustment is made for the inflow of individuals not showing up in the first month after becoming unemployed because of a time lag in registration. The same data base was also used to estimate the average duration of unemployment for each region, so we can present the results for the inflow rates together with the duration of unemployment and the unemployment rate itself.

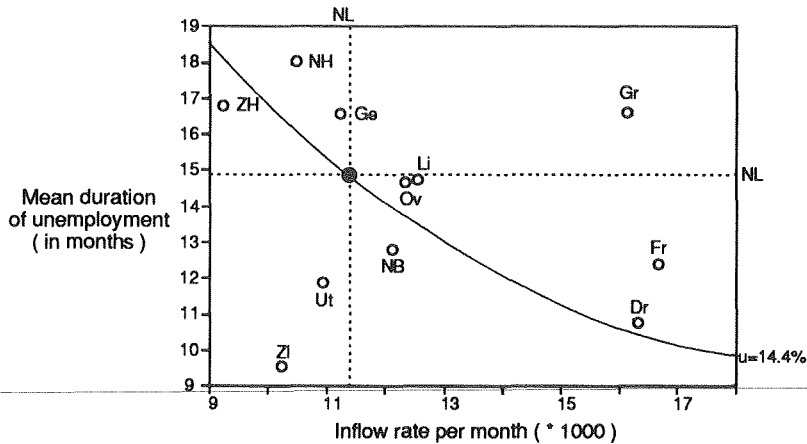
An interesting way of showing regional data on unemployment inflows and duration is presented in Figure 2. In this graph we show the inflow-duration combinations of Dutch regions for the year 1985. A (so-called) iso-unemployment curve is drawn through the reference point of the national economy. This implies that the curve combines all points of unemployment inflow and mean duration that lead to the same unemployment rate as the national rate, calculated under the assumption of stationarity, i.e., inflow = outflow. The analytical expression of this curve can be shown to be:

$$q = u / ((1 - u) * d)$$

where u denotes the unemployment rate,
 q is the inflow rate, and
 d is the mean duration of unemployment.

It appears that the regional variation of unemployment inflows is considerably and remarkably different from the regional variation in mean duration of unemployment. In addition, we observe that although the unemployment rate may be approximately the same (see the iso-unemployment curve), the outcomes for the inflow rate are quite different (see Figure 2).

Figure 2: Regional differences in unemployment inflow and the mean duration of unemployment in the Netherlands (1985).



Gröningen = Gr	Noord-Holland = NH	Friesland = Fr
Zuid-Holland = ZH	Drenthe = Dr	Zeeland = Zi
Overijssel = Ov	Noord-Brabant = NB	Gelderland = Ge
Limburg = Li	Utrecht = Ut	Netherlands = NL

Next, we will consider the data on unemployment inflow rates during the sample period of 1985-1988. Because we use the annual average of the inflow rate for the regions, the seasonal fluctuations do not appear. It has to be emphasized that the seasonal fluctuations can be quite high and may vary among the regions.

Without going into detail regarding specific regional characteristics, we will discuss the regional inflow rates in the light of a simple classification of Dutch regions in core and peripheral areas. Usually, the economic core of the Netherlands is associated with the Rimcity ("Randstad"), consisting of the main urban centers in the provinces of Utrecht, Noord-Holland and Zuid-Holland. Nowadays, there is a tendency to expand the core so that it also includes the main agglomerations in the provinces of Gelderland and Noord-Brabant (see the recently published strategic policy report of the Ministry of Housing and Physical Planning: the so-called "Fourth Memorandum on Physical Planning").

On the basis of this demarcation of the Netherlands, we will now compare the core and peripheral regions with respect to their inflow rates of unemployment.

However, two main problems still remain. First, the classification of regions according to provinces is rather crude and hence it is sometimes diffi-

cult to determine whether or not a province is a core region. For instance, the southern part of the province of Noord-Holland (including Amsterdam and Schiphol Airport) is definitely part of the economic core, but the northern part is rather isolated. Secondly, some regions may perhaps be peripheral from a national perspective, but from an international perspective have a rather central position. An example of the latter phenomenon is the Dutch province of Limburg (located near the important economic gravity center of Aachen-Liege in Germany-Belgium).

In addition, we have to realize that a comparison based on the unemployment inflow rate is a *partial* analysis of the economic condition of the region and that of course a classification based on other economic variables (for example, the unemployment rate) might lead to somewhat different results.

With these remarks in mind, now consider the cross classification of the position (central or peripheral) of Dutch regions and their inflow rates of unemployment in Table 1 and Figure 3.

Table 1: Cross-classification of the nature of the regions with the inflow rates per month.

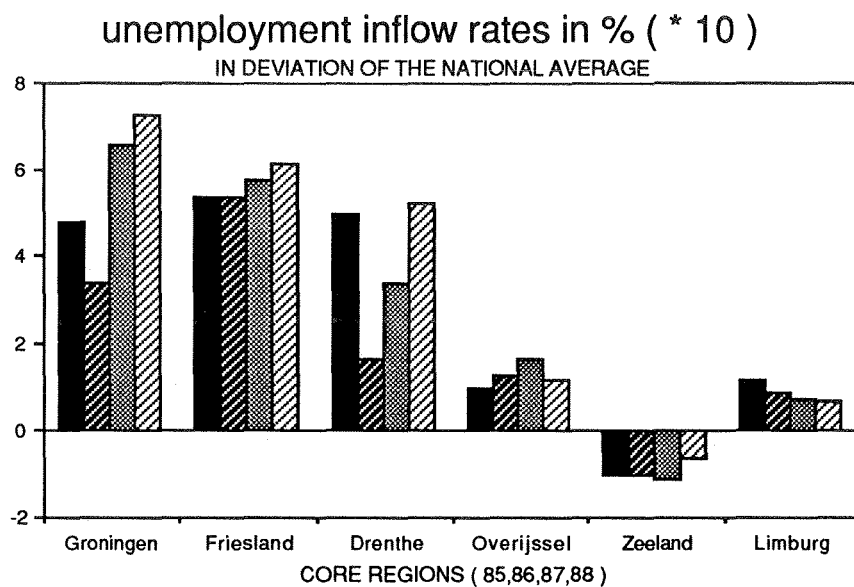
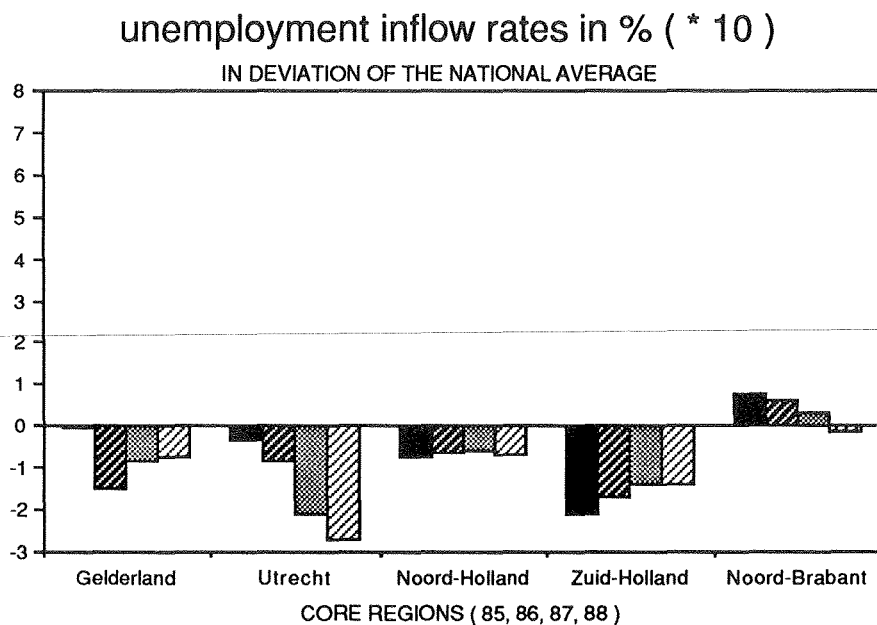
<i>inflow rate per month</i>	<i>core region</i>	<i>no core region</i>
below national average	Ge,Ut,NH,ZH*	Z.
above national average	NB	Gr,Fr,Dr,Ov,Li

* Names of regions below Figure 2.

The picture of the inflow rate in the various regions is rather clear. We see that in general the core regions are characterized by relatively low inflow rates. The northern provinces (Gr, Fr, Dr), all peripheral, have a relatively high inflow rate (per month, almost 1% higher than the other regions). For the other three provinces (Ov, Li, ZI) the picture is less obvious, which might be due to the cross-border economic influence of Germany and Belgium. Thus, from the viewpoint of inflow rates, the main difference is not between "the core" and "the periphery," but between the northern periphery and the rest of the country.

In summary, we have investigated the relationship between the unemployment inflow rate and the position (core or peripheral) of the region and found that some peripheral regions perform equally with the core regions, but that the inflow rates in the northern provinces are relatively high. In order to gain more insight into the underlying causes of the observed regional differences in the inflow rates, a comparison of regional characteristics is made by means of a multiple regression analysis in the next section.

Figure 3: Unemployment inflow rates for the Dutch core and peripheral regions during the period 1985-1988 (evaluated in deviation of the national average).



AN EXPLANATORY ANALYSIS WITH REGIONAL CHARACTERISTICS

A possible explanation for the observed spatial differences of the regions is the difference in economic and demographic structure. In this section we will try to explain regional unemployment rates by means of economic and demographic variables with a multiple regression model. Following the approach of Armstrong and Taylor (1985), two groups of variables are included in the regression analysis: variables reflecting pressures of regional demand (seasonal/sector structure, vacancies) and variables reflecting the structure of the regional labor force (age composition, educational level). Institutional and social differences in the regions (like the existence of employment agencies, the propensity to register, the attitude of the social environment, etc.) could also be of significant importance but they are extremely difficult to capture in relevant variables.

Armstrong and Taylor expect that the seasonal and cyclical fluctuation of changes in the regional demand for labor (employment change) are important determinants of the regional unemployment inflow rate. Regarding the effect of employment change on the unemployment inflow via the number of lay-offs, Armstrong and Taylor note that (1985:46): "The lay-off rate is likely to be higher in localities heavily dependent upon industries which are highly sensitive to either seasonal or cyclical fluctuations in labor demand." In addition, they expect that changes in regional labor demand may also have an effect on the other main inflow components (voluntary quitting, first-time entrants and re-entrants). For example, search and quit behavior may become more intensive when the chances of finding a job are favorable. Better job prospects may also attract people from "out of the labor force," whilst school-leavers are more likely to enter the stock of employed instead of becoming unemployed or delaying their entrance.

In our empirical application for the Netherlands, the cyclical component is left out because the differences in regional flow data are studied on an annual basis. A measure of the seasonal sensitivity of each region is constructed by regressing the regional unemployment rate on the national unemployment rate together with a suitable time trend for the 12 (monthly) observations during each year (analogous to Taylor and Bradley, 1983). The estimated coefficient of the national unemployment rate is then used as an index of seasonal variation of unemployment relative to the national pattern. In this regression model, time trend variables take account of the structural development of regional unemployment. The partial correlation with the fluctuations in the national unemployment rate is then thought to be an index of seasonal sensitivity of the region. It is obvious that we expect a positive correlation with the inflow rate.

An alternative way of capturing the seasonal effect on the unemployment inflow rate would be to consider the relative share of sectors with a high degree of seasonality in a regional economy. We take into consideration the percentage of employees in the construction and in the commercial service sector (including insurance companies, banking, etc.), because for these sectors we expect the highest and the lowest seasonal sensitivity, respectively.

Another demand-side variable to be included in the regression model is the number of vacancies relative to the labor force. This variable is used as a proxy of regional labor demand (number of job opportunities) and consequently we expect it to be negatively correlated with the flow into unemployment. If the number of vacancies is large, people (re)-entering the labor force and those facing lay-offs may both find new jobs without becoming unemployed.

Next, variables reflecting supply-side influences on the level of the inflow rate have to be considered. First, the age composition of the regional labor force (reflected in the difference between the percentage of people younger than 25 years in the region and the country as a whole) may play a role in the level of the inflow rate. A region with a relatively young labor force is expected to have a higher inflow rate because of the higher rotation of jobs among young people. On the other hand, young people may have lower wage costs and may be more able to adjust to changing conditions. Therefore, young people may become less unemployed than older people. The outcome of the sign of the estimated coefficient is thus uncertain; it depends on the magnitude of the positive and negative effects of age on the inflow rate.

Secondly, the educational level of the labor force in a region might influence the number of individuals becoming unemployed in that region. The people with a higher education tend, on the average, to suffer less from unemployment, and hence, we expect this variable to be negatively correlated with the inflow rate.

Other determinants of inflow rates (not reflecting demand- or supply-side influences) are migration and participation, noted earlier, but these variables are not included in the regression analysis. This omission has no impact on the analysis because:

- 1) migration does not play a role in the process of becoming unemployed, because men rarely change from region of residence without first having a job in the new region.
- 2) there is not much variation in the male participation rate on the provincial level, so that there is no need to include the participation variable in the regression analysis.

As mentioned earlier, the data set to be used consists of a time-series of cross-sectional (i.e., regional) observations. Pooling of cross-sectional data

from different time series gives rise to the statistical difficulty that the usual assumption of independently distributed error terms cannot be maintained: one may expect a positive correlation between errors of different time periods for the same region. To solve this problem, we introduce the Z term in the equation. Hence, the following regression equation is specified:

$$Y_{rt} = \alpha_t + \beta_1 \cdot X_{1rt} + \beta_2 \cdot X_{2rt} + \beta_3 \cdot X_{3rt} + \beta_4 \cdot X_{4rt} + Z_r + \varepsilon_{rt} \quad (1)$$

with (defined for each region r and time period t)

Y = the flow into unemployment as a percentage of the total regional employed stock

X_1 = the number of vacancies divided by the total regional labor force

X_2 = the percentage of people in the group of employed people younger than 25 years

X_3 = the reaction coefficient of the regional unemployment rate on variations in the national unemployment rate

X_4 = the percentage of employed people with a higher than average education

ε = error term $N(0, \sigma^2)$ distributed for each region r

Z_r = unobserved regional (or "fixed") effect.

Because the unobserved regional effect is constant over time, it is possible to eliminate this effect by taking each variable in deviation of its regional average value over time. The effect of omitted spatial variables are captured by the constant α_t . In addition, this variable absorbs the variations in unemployment inflow rates due to the use of different data sources (namely, estimates for the period 1985-1986 and directly observed values for the period 1987-1988).

Then equation (1) turns into:

$$Y_{rt}^* = \alpha_t^* + \beta_1 \cdot X_{1rt}^* + \beta_2 \cdot X_{2rt}^* + \beta_3 \cdot X_{3rt}^* + \beta_4 \cdot X_{4rt}^* + \varepsilon_{rt}^* \quad (2)$$

and can now be estimated by OLS (an asterisk shows that the variables are evaluated in deviation of the average over time). The constant is estimated by a "mean" intercept α_0 and dummy variables for the different years (the reference year is 1985). So, the equation to be estimated becomes:

$$Y_{rt}^* = \alpha_0 + \beta_1 \cdot X_{1rt}^* + \beta_2 \cdot X_{2rt}^* + \beta_3 \cdot X_{3rt}^* + \beta_4 \cdot X_{4rt}^* + d_{86} + d_{87} + d_{88} + \varepsilon_{rt}^* \quad (3)$$

The results of the regression analysis on the basis of data on 44 observations are presented in Table 2. We have eliminated the percentage of employees with a higher than average education and the indicator of the

seasonal sensitivity of the region, because these variables just had negligible effects on the flows into unemployment.

Table 2: OLS estimates (t-values in parentheses).

α_0	β_1	β_2	d_{86}	d_{87}	d_{88}	R^2
-1.08	-2.18	-0.31	-0.42	2.43	2.31	0.73
	(-2.19)	(-1.21)	(-0.96)	(3.33)	(3.40)	

Number of observations: 44

Another attempt to incorporate specific variables reflecting the seasonal sensitivity (i.e., the share of the construction and the commercial service sector in regional employment, respectively) failed, because these variables also had no effects on the inflow rate (t-values were almost 0). In other words, the spatial variation of the sectoral variables is too small on the provincial level.

The relative number of job opportunities has a significant negative effect on the unemployment inflow rate. In regions with a relatively high number of vacancies, it is easier for employed people to move from job to job without becoming unemployed, and new entrants have higher chances to obtain a job instead of becoming unemployed first. Our model estimates predict that an increase in the relative number of vacancies of 1% will lead to a reduction of 0.22% in the unemployment inflow rate (remember that the inflow rate in the northern peripheral regions is about 0.5% higher than the national average). From a policy viewpoint, this implies that stimulating labor demand in some regions (in particular the northern regions) would reduce the flow into unemployment (for example, by means of employment programs).

Regions with a relative high share of young employed people have lower inflow rates, probably due to the higher flexibility and adaptability of youngsters on the (regional) labor market.

We notice that the main conclusion of the study of Armstrong and Taylor (1985) is also valid for the Netherlands; differences in labor demand are the major causes of spatial variations in the unemployment inflow rate. The effect on the inflow rate of the age-structure is, however, not found in the Armstrong and Taylor model for Britain.

Unfortunately, we were unable to find more specific significant explanatory variables responsible for spatial differences in unemployment inflow rates. We found almost no effects for the percentage of employees in the construction and in the commercial service sector and the percentage of employed people with a higher than average education. We conclude that it is not easy to find regional characteristics which give a statistical explanation

of variations in the flow into unemployment. A possible explanation could be the level of spatial aggregation on which this analysis was carried out. The geographical scale is probably too high, so that other relevant explanatory variables are not likely to play a role. However, this might be different at a lower level of aggregation (cf. the problem of "ecological fallacy"; see Openshaw and Taylor, 1981).

Besides the high level of aggregation, the present regression analysis has the limitation that the labor market areas, discerned on statistical grounds, are not equal to the "real" labor market areas classified by, for instance, the criterion of a given commuting radius of employees.

CONCLUDING REMARKS

In this paper, we have investigated the "roots" of unemployment, namely the inflow. This flow may vary considerably between different types of workers and different regional labor market areas. We have explored Dutch data concerning the existence of the latter phenomenon and examined the relationship between the inflow rate and the geographic position (core or periphery) of the region.

We tried to explain spatial differences in the unemployment inflow rate by means of a regression model with the regional characteristics as explanatory variables. It turned out that regions with a relatively high number of job opportunities and a relatively high share of young employed people exhibit relatively low inflow rates into unemployment. The significance of demand-side influences on the unemployment inflow rate is in line with previous findings of Armstrong and Taylor.

Our final remark concerns the desirability of an inflow reducing policy. In order to reduce regional unemployment, special programs to stimulate the re-entry of long-term unemployed are welcome, but measures aiming at reducing the flow of people becoming unemployed should not be neglected.

NOTES

1. The distribution of the inflow over the possible sources is known, however. For the Netherlands as a whole, we can say approximately that seven of the ten people who become unemployed were fired, one left school and two came from other categories out of the labor force (on the basis of yearly averages).

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