UNEMPLOYMENT IN THE NETHERLANDS: WHO CURES? WHO PAYS?

J. Muysken¹

1 Introduction: on diagnostics and cures*

This conference was presented to me as a challenge for economists to look at their research on unemployment problems and to think about possible policy consequences. However, maybe even more than many of his colleagues, the organizer of this conference himself is fully aware of the many pitfalls that occur when one tries to infer policy prescriptions from an analysis of the causes of unemployment. For, de Neubourg (1988, pp. 66-67) argues that "Various instruments, combined in various policy mixes, may and can be used to combat unemployment. Judgements on the actual mix that is expected to be the most successful, cannot be provided by analyses alone." And he refers to Malinvaud (1982, p. 1) who states "Neither economic theory nor macroeconometric models can give today the kind of clearcut answers that would be directly useful for policy makers." I will not dwell here on the various severe problems that one usually encounters when one tries to translate research outcomes into policy prescriptions. However, two problems should be mentioned in this introduction because they are particular relevant to the discussion below.

The first problem is the partial character of many analyses. Most analyses only deal with one aspect of the unemployment problem, and due to obvious constraints of analytical manageability they are forced to ignore possible interactions with other aspects of the problem. Therefore one may argue that in principle the

* As a preliminary statement I want to avoid the wrong impression that this paper deals with the measurement of the costs of unemployment. The title refers to the well-known fixer's slogan: "no cure, no pay." And contrary to that slogan, everybody has to pay in the absence of a solution of the pressing unemployment problem. Unemployed people have to pay by means of loss of social status and contacts, of income and of work satisfaction. The society at large has to pay by means of unused productive capacity - i.e. production and income foregone - loss of human capital and unemployment benefits. These points seem rather obvious: However, in my opinion their importance has not always sufficiently been recognised in the past. It is very important that the unemployment problem is cured and the questions then are: what are these cures and who pays (if at all) to solve unemployment. These are the questions that I discuss in this paper.
unemployment problem should be studied using a macroeconomic model which takes many of these interactions into account [Muysken (1989)]. But even such a model is not able to take all relevant interactions into account - in particular those of a more qualitative nature which involve changes in the underlying microeconomic process. Actually there may exist a trade-off between the extent to which one is able to analyse some of the underlying microeconomic processes and the extent to which one can take possible interactions into account. Therefore it is obvious that the outcomes of whatever analysis is used should be interpreted with great care.

The second problem arises even when one has a macroeconomic model which enables one to analyse the unemployment problem in a satisfactory way, recognising the most relevant interactions. The problem is that an analysis which successfully identifies the causes of (an aspect of) unemployment does not necessarily tell us much about possible cures. There are two reasons for this. First, the identification of causes may be successful only to a certain degree. For instance, when a lack of aggregate demand is identified as a cause of unemployment, this lack may actually be due to high wages relative to other countries, leading to a poor export performance. The second reason is that several instruments which might be relevant for a solution of the problem may not be present in the analysis, for instance because they are new instruments or have not been recognised explicitly as such in the analysis.

Both problems will appear in the discussion below. My analysis is of a partial character. Given labour supply, unemployment is explained by demand for labour, given production, investment and relative prices. Thus my discussion of unemployment is based on an analysis of the production structure, which is described by means of a putty-clay vintage model, and of the employment function. Nonetheless this analysis may provide some useful insights which can be relevant when thinking about unemployment policies. First of all I will point out certain considerations which should not be ignored when policy measures are discussed. These will concern two problems which in my view are not sufficiently recognised in the present policy discussions: the low rate of capacity utilization and the high rate of long-term unemployment. The second problem is getting more and more attention in economic analysis, however. A recognition of the importance of these two problems certainly will have consequences for unemployment policies and I will briefly speculate on some consequences.

The structure of the paper is as follows. First, in section 2, I will give a brief outline of the Dutch unemployment situation and discuss some important underlying developments. Special attention will be paid to the development of the rate of capacity utilization and that of long-term unemployment. Next, in section 3, the results of an analysis of the production structure of the Dutch economy will be presented, which enables a discussion of the causes of unemployment in terms of classical and Keynesian demand for labour. In that context the problem of the low rate of capacity utilization will be highlighted. Moreover, in order to link
demand for labour with (un)employment, the employment function will be introduced. This function is further analysed in section 4, where special attention is paid to the role of long-term unemployment. Also the unemployment-vacancies rate is shown to play an important role in the determination of long-term unemployment. Finally, the relevance of the above analysis for unemployment policies is discussed in section 5.

2 High unemployment: no cure no pay - but high costs

In line with my preliminary statement, I will present in this section the size of the current unemployment problem and discuss some of its causes. My aim is to give a background of some developments in the Dutch economy which are relevant for the partial analysis in the following two sections. The high costs of unemployment will be evident once we observe its sheer size (see Figure 1 below) and the underlying stagnation of the Dutch economy in the period after 1970 until quite recently. As we will see, this stagnation has created an unemployment problem which cannot be solved when investment and employment growth return to their pre-1970 paths with respect to output growth, as they do nowadays. More has to be achieved, but I will postpone a further discussion on possible cures till the last section. Let us first look at the Dutch situation below and further analyse the unemployment problem in the next two sections.

The development of the rate of registered unemployment in the Netherlands is depicted in Figure 1, together with that of long-term unemployment (longer than one year). One sees from the figure that up to the early seventies the rate of unemployment fluctuated between 1 and 5 per cent. Then it increased to a level of 7 per cent in the period 1975-1979 and in the period 1980-1983 it made the enormous jump from 7.4 per cent to 17.4 per cent. Afterwards it declined somewhat to 14 per cent in 1988. The rate of long-term unemployment increased even more sharply after the early seventies, since the share of long-term unemployment in total unemployment increased from 16 per cent in 1970 to 50 in 1988. Out of total unemployment 32 per cent is younger than 24 years old. The high share of youth unemployment indicates the immense danger of a 'lost generation', which also implies an enormous loss of human capital. The causes and consequences of long-term unemployment will be further discussed in sections 4 and 5.

The increase in unemployment is also reflected in Figures 2 and 3. In Figure 2, the rates of inflow to and outflow from unemployment are presented. From the figure one sees that the rate of outflow decreases till the mid-sixties and increases afterwards. The same holds for the rate of inflow, which lies very close to that of outflow, except for the years 1970-1975 and 1980-1983. In those years the rate of inflow jumps and exceeds the rate of outflow. Thus the increase in unemployment is in particular due to an increased inflow in unemployment. From Figure 3 we
then see that this increase in the inflow in unemployment is the net result of a decline in employment and an increase in labour supply. Labour supply increased partly due to demographic reasons and partly due to an increase in the participation rate of women. This rate increased from 25.8 per cent in 1970 to 29.1 per cent in 1980 and 36.0 per cent in 1985. Employment stagnated in the period 1971-1980, with a trough after the first oil crisis, but collapsed after the second oil crisis from 4.1 million people in 1980 to 3.8 million people in 1983. It recovered afterwards slowly to its 1969 (!) level of 4.04 million in 1988.

In order to take a closer look at the development of employment, it may be of interest to look at the development of the underlying demand for labour and its relationship with production and investment. This is depicted in Figure 4, where both demand for labour and investment are normalised to the level and rate of growth of production in the period 1954-1970. From the picture we see that production, investment and demand for labour grow in a rather harmonious way in the period 1954-1970. But after 1970 the picture changes radically: The growth in production slows down, investment stagnates and demand for labour even shows a tendency to decline. Fluctuations in demand for labour appear to lag at least one year behind those in investment. The sharp fall in demand for labour is preceded by a strong decrease in investment starting in 1979, investment picks up again after 1982 and labour demand follows one year later. From then on, both growth in investment and in demand for labour are again more or less at their pre-1970 levels in relation to output growth. However, the growth in output is lower than its pre-1970 level, and the stagnation in investment and demand for labour during the period 1970-1983 has created an unemployment problem which cannot be cured unless output will grow faster - or labour productivity decreases, of course.

An important question is what caused the stagnation in investment and decline in labour demand, relative to output growth, after 1970. Two factors that undoubtedly have played an important role are the slow-down in output growth and the high real wage costs. The development of the latter is depicted in Figure 5 together with the development of labour productivity. One sees that in particular after 1970 wage costs started to exceed labour productivity and this, in combination with poor output prospects, caused a stagnation in investment and demand for labour. Moreover, demand for labour got an extra negative impulse since the high real wage costs caused an accelerated scrapping of old labour intensive equipment which was replaced, if at all, by labour extensive equipment. I shall elaborate this in the next section. There is one other development, however, which has received much less attention in recent discussions of the economic situation in the Netherlands: The stagnation after 1970 has been accompanied by a rather persistent low rate of capacity utilization.
Figure 1
The rates of total and long-term unemployment

Figure 2
The rates of inflow to and outflow from unemployment
The development of the rate of capacity utilization is presented in Figure 6, both for the whole economy and for manufacturing only. The latter rate is based on survey-information collected by the Central Bureau of Statistics. The rate of capacity utilization for the whole economy is based on a weighted average of survey-information and data obtained from peak-to-peak interpolation. From the figure one sees that the rate of capacity utilization dropped sharply after the first oil crisis, recovered only partly afterwards, fell even to a lower level after the second oil crisis and picked up again after 1982. Two features are remarkable in this development. First, both in the whole economy and in manufacturing the rate of capacity utilization has been distinctly low for a remarkably long period, 1974-1984. Second, whereas the rate of capacity utilization in manufacturing recovered in the late eighties to its level of the early seventies, that of the whole economy only recovered partly and still is remarkably low. The low level of capacity utilization in the period of stagnation 1974-1984 may also have contributed to that stagnation due to induced scrapping of equipment, discouragement of new investment and (forced) labour hoarding. Although the low rate of capacity utilization partly reflects the decline in output growth after 1970, one might therefore argue that it also has induced this decline. I shall elaborate this in the following section.
Figure 4
The development of labour demand, production and investment

Figure 5
The development of real wage costs and labour productivity
Figure 6
The development of the rate of capacity utilization

Figure 7
Unemployment and vacancies
1950 - 1988
Finally, it is interesting to look at the development of unemployment and vacancies. For the coexistence of unemployment and vacancies gives an indication of the qualitative discrepancies on the labour market and can be associated with structural unemployment. Unemployment and vacancies are presented in Figure 7. Actually two sets of data are presented for vacancies. One set is registered vacancies and the other set is consistent with the survey data collected by the Central Bureau of Statistics. The latter have been collected from 1981 onwards and in Muysken and de Rigt (1989) we have used both these survey data and data on advertisements to correct the registered vacancy data for the period 1950-1980, in order to make them consistent with the survey data from 1981 onwards. The thus observed registration rate of vacancies appears to have dropped from fluctuations around 75% in the period 1960-1980 to only 40% in 1988. As a consequence, the vacancies based on the survey data exceed the registered vacancies considerably in the late eighties, as one can see from Figure 7.

From the figure one sees that unemployment and vacancies fluctuate inversely around each other in the period 1950-1973. The enormous increase in unemployment in the early seventies causes a gap with vacancies, which is widening till unemployment starts to decrease in 1984. However, in 1988 the gap is still immense, and one almost wonders whether ever "the twins will meet again."

3 Classical and Keynesian unemployment

As I have argued in Muysken (1989), disequilibrium analysis has been applied and classical and Keynesian unemployment have been distinguished in the Netherlands since 1974. For in that year the Central Planning bureau published a decomposition of unemployment in classical unemployment and Keynesian unemployment, based on the clay-clay vintage analysis of Den Hartog and Tjan (1974). That analysis gained wide attention because it stressed the role of high real labour costs in inducing an accelerated scrapping of old labour intensive equipment, i.e. in reducing its economic life time. It was this factor which in particular was responsible for the stagnation in demand for labour and a reduction of real labour costs was indicated. In the analysis the rate of technological change (productivity growth) and new investment also play an important role in determining demand for labour, but these factors only played a minor role in the discussion of the unemployment problem.

Since the vintage models have a very strong intuitive appeal as a proper description of the production structure of an economy and the analysis of Den Hartog and Tjan provided some interesting and challenging insights, several vintage models have been estimated for the Netherlands afterwards. More recent vintage models are of a putty-clay nature, and it is in that tradition that we have analysed in Muysken and van Zon (1988) the unemployment in the Netherlands, 1960 - 1984. In the 'putty' part of our model substitution ex-ante between capital
and labour is allowed according to a CES production function. Once installed, production processes are characterised by fixed technical coefficients - this is the 'clay' part of the model. The addition to both productive capacity and capacity demand for labour in a certain year then is determined directly by the amount of investment in that year.

As is usual in vintage models, a distinction is made between embodied and disembodied technical progress. Embodied technical progress applies to new machinery and is fixed (embodied) in equipment once it is installed. Disembodied technical progress on the other hand also is relevant for existing machines: it influences equipment of different vintages in the same way. We find that the largest part of technical progress is embodied labour augmenting technical progress, which lies around 5 per cent up to 1974 and drops to 0.5 per cent afterwards. From the development of productivity growth which was presented in Figure 5, such a sharp drop seems implausible, but a slow-down certainly can be observed.

In our model, equipment can be scrapped prematurely due to either economic obsolescence or due to systematic underutilization. Compared to the analysis of Den Hartog and Tjan, the latter is a new argument which turns out to be relevant in the eighties. In the period before 1980, 5 till 7 per cent of productive capacity is scrapped due to economic obsolescence, i.e. due to a negative quasi-rent. From 1980 onwards scrapping occurs due to excess capacity, i.e. in excess of normal capacity utilization, and between 8 and 10 per cent of productive capacity is scrapped annually. If the loss of productive capacity is restored by investment in new equipment, this will result in a decline in demand for labour due to the increase in labour productivity resulting from embodied progress. Hence additional investments are required to maintain full employment. However, our results show that from 1970 onwards investments were not sufficient to compensate the decrease in labour demand due to premature scrapping of equipment.

Actually, the results of Muysken and van Zon (1988) enable me to distinguish between classical and Keynesian demand for labour. Classical demand for labour then is demand for labour consistent with normal capacity utilization, N*, corrected for labour hoarding. The correction for labour hoarding can be inferred from the results in Muysken and van Zon (1988), where we distinguish between voluntary labour hoarding, related to normal capacity utilization, and forced labour hoarding, dependent on past employment. We found that forced labour hoarding dominated only in four years, and therefore we correct classical demand for labour for voluntary labour hoarding only. That is, classical demand for labour is generated by means of the following equation:

\[ N' = (1-\gamma).N^* + \gamma.N_1 \]  

(1)

The parameter \( \gamma \) then indicates the lagged adaptation of classical demand for labour to normal demand, and hence indicates the presence of labour hoarding.

These results on labour hoarding also inspired me to approximate Keynesian
demand by means of observed demand, i.e. by employment plus vacancies. The resulting development of Keynesian and classical demand for labour is presented in Figure 8. From the figure one sees that Keynesian demand for labour exceeds classical demand till 1972. From the mid-seventies on, Keynesian demand lies below classical demand, except for a few years and it drops sharply after 1980. The development of Keynesian demand for labour is consistent with the increasing underutilization of productive capacity, which I discussed in Figure 6. This underutilization also induces premature scrapping of equipment, which in its turn leads to a decline in classical demand for labour too. Thus, due to its persistence the low utilization rate is not only responsible for a sizeable amount of Keynesian unemployment, but it can be seen as one of the determinants of classical unemployment too.

Figure 8
Labour supply, Keynesian and classical demand for labour

Classical demand for labour increases till 1970 and starts to decline afterwards. This is consistent with the stagnation of investment in the period 1970-1984 which we observed in Figure 4. Since labour supply increased during that period, see Figure 1, the resulting gap between labour supply and classical demand for labour is about 600,000 in 1984. This indicates a severe capital shortage. Moreover, the low rate of capacity utilization caused Keynesian demand for labour to lie below classical demand for labour by almost 200,000 man years. Since we saw in Figure
6 that the rate of capacity utilization did not rise substantially after 1984, I expect
that there is still a sizeable amount of Keynesian unemployment in 1988. Classical
unemployment will have decreased, however, due to strong increase in investment
after 1984.

I should be careful, however, to present the above findings directly in terms of
classical and Keynesian unemployment. For this would implicitly identify demand
for labour with employment. But employment should be seen as a function of both
demand and supply of labour: This is the employment function which we shall
elaborate in the next section. Therefore the gap between supply and demand
cannot directly be interpreted as unemployment. Nonetheless, the divergence
between Keynesian or classical demand for labour and labour supply are important
indications of what will happen to Keynesian or classical unemployment.

Before turning to a further analysis of the employment function in the next
section, I would like to make two brief comments on the relevance of the above
analysis for economic policy. First in addition to the nowadays almost
conventional wisdom of the Den Hartog-Tjan analysis, our analysis has
highlighted the role of persistent underutilization in scrapping of equipment. It
seems reasonable to believe that this causes more than a healthy Schumpeterian
shake-out. And economic policy should be alert to prevent too persistent a low
rate of capacity utilization.

Next, although I have only mentioned it rather briefly above, the impact of
technical progress is very important. Our analysis indicated a slow-down of
embodied labour augmenting technical progress since the mid-seventies. As a
consequence new equipment is less labour extensive compared to scrapped
equipment, than it should be otherwise. However, one might wonder whether this
also holds for the recent surge in investment: it might be the case that technical
progress is picking up again. And in that case even more investment and output
growth is necessary to restore full employment. On the other hand, this is a rather
defensive attitude towards technical change, which ignores the increase in demand
which might result from product innovations and higher incomes due to increased
productivity. However, these elements fall outside the scope of the above analysis
and we shall return to them in the final section.

4 Structural unemployment and unemployment persistence

4.1 Persistence in the employment function

Structural unemployment is defined as unemployment due to the existence of
qualitative discrepancies on the labour market, and for simplicity I also include
frictional unemployment - which is associated with the normal dynamics of job
changes. Structural unemployment shows up in the fact that unemployment and
vacancies coexist on the labour market. I discussed this for the Netherlands in
Figure 7 above.
Structural unemployment usually is measured at stock equilibrium on the labour market, i.e. at a level where unemployment and vacancies are equal. In order to measure structural unemployment it then is convenient to have a relationship between unemployment and vacancies. To this end frequently a log-linear relationship between both is postulated, which is elaborated in the so-called UV-analysis. I prefer to use a relationship which stems from a different tradition, the disequilibrium analysis. This is the relationship implicit in the employment function, which explains employment as a function of demand and supply of labour. The most simple form of the employment function is the so called aggregate min-condition, which can be expressed as follows:

\[ E = \min(N^i, N^v) \]  

This form of the employment function by definition implies zero structural unemployment, since vacancies and unemployment cannot co-exist.

But the notion of an aggregate min-condition is questionable. Underlying this condition is the notion that transactions are determined by the short-side of the market. On the aggregate level there is not one market whose short-side determines transactions, however. Actually the aggregate is the result of a multitude of market-transactions, both on markets with excess supply and on markets with excess demand. As a consequence the min-condition does not hold on an aggregate level and the aggregate level of transactions will generally be less than the minimum of aggregate demand and supply. Kooiman and Kloek (1979) elaborated this idea by assuming that demand for labour and supply of labour are distributed over micro-markets according to a log-normal distribution. On each micro-market the min-condition holds. Then they show that an aggregate transaction function can be derived.

Lambert (1988) proved that when a log-normal distribution of demand and supply is assumed, the aggregate transaction function can be approximated by a CES-form. This implies that the employment function can be written as follows:

\[ E = \left( (N^i)^{\Theta} + (N^v)^{\Theta} \right)^{\Theta} \quad \Theta > 0 \]  

and the implied structural rate of unemployment is:

\[ u^* = 1 - 2^\Theta - \Theta \ln 2 \]  

for at that rate unemployment equals vacancies, or to put it differently, demand for labour equals supply. This form of the employment function is analytical convenient and the parameter \( \Theta \) is positively related to the variance of the underlying distribution of micro-markets. Therefore we have used this in Muysken and de Regt (1990) to analyse the nature of structural unemployment.

In that study we are in particular interested to analyse the notion of hysteresis in structural unemployment, that is mechanisms according to which structural
unemployment tends to enforce itself and thus to become more and more persistent. This is partly motivated by the enormous increase in long-term unemployment which is witnessed in Figure 1 above.

There are at least two ways in which hysteresis can be introduced in the employment function. First it can be argued that the variance of demand and supply over micro markets will increase when aggregate unemployment did increase. For in that case both employers and workers will be less inclined to look at other labour markets to satisfy their excess demands for labour and their excess supplies, respectively, than they would in case of lower aggregate unemployment.22 Hence there will be less movements across markets than would occur otherwise and this tends to increase the variance of demand and supply. This notion can be introduced in the specification of the employment function (3) by making the parameter $\Theta$, which is positively related to the variance of the distribution, positively dependent on lagged unemployment. Usually a positive trend term also is included to account for structural shifts.23 A possible specification is:

$$\Theta = \Theta_0 + \Theta_1 u_1, \quad \Theta_0, \Theta_1 > 0$$ (5)

Substituting this in equation (4) one immediately sees that structural unemployment $u^*$ increases when past unemployment increases. Approximately holds:

$$u^* = (\Theta_0 + \Theta_1 u_1) \ln 2$$ (6)

One sees that an element of persistence is introduced in structural unemployment, since in a way it feeds itself through lagged unemployment. The dynamic process implicit in equation (5) - assuming equilibrium on the labour market in each period - has a stable steady state level of structural unemployment, $u^{**}$.24 It is obvious that the higher the impact of lagged unemployment is on structural unemployment, the larger its steady state level $u^{**}$ is.

A second way to introduce persistence in the employment function is through the notion that long-term unemployment reduces the effectiveness of labour supply. That is, long-term unemployed are not (always) considered as serious candidates for available jobs for various reasons. As a consequence, when actual labour supply is included in the employment function it should be premultiplied by a factor which is negatively related to the rate of long-term unemployment, $u^*$. A simple specification for this factor is $(1-u^*)^\alpha$ and the resulting 'effective' labour supply, $N^*$, is:

$$N^* = (1-u^*)^\alpha N' \quad 0 \leq \alpha \leq 1$$ (7)

In the case that $\alpha$ is zero all long-term unemployed are considered as serious candidates for jobs, whereas when $\alpha$ equals unity no long-term unemployed are.
One might expect $\alpha$ to lie somewhere in between zero and one, this is elaborated below. It then is obvious that the rate of structural unemployment will increase when the rate of long-term unemployment increases. This can also be seen when one uses the approximation of equation (6) to derive structural unemployment. This yields:

$$u^* = \Theta \ln \left( 1 + (1-u^*)^{\alpha - 1} \right), \quad \Theta = \Theta_0 + \Theta_1 u_1$$  \hspace{1cm} (8)

It can be shown that, given $u^*$, the dynamic process implied by equation (8) also leads to a stable steady state equilibrium.

It is clear that the introduction of long-term unemployment in the analysis leads to a further increase in the rate of structural unemployment, compared to equation (6). Dependent on the value of $\alpha$ a certain amount of long-term unemployed is cut-off from the labour market and therefore increases structural unemployment. The higher $\alpha$ is, the higher this increase will be - and hence the higher the steady state rate of structural unemployment will be too.

4.2 Persistence in long-term unemployment

We mentioned above in equation (7) that $\alpha$ might be expected to lie between zero and one. One of the reasons is that on some micro markets demand for labour will exceed 'effective' supply of labour, and one can hardly expect that long term unemployed will not be hired in that case. In an extreme case, one might assume that long-term unemployed will only be hired when vacancies exceed short-term unemployment. However, we shall employ the more general assumption that the employment probability of a long-term unemployed person is $\beta$ times that of a short-term unemployed one, where of course $0 \leq \beta \leq 1$.

Moreover we assume that both short-term unemployed at the end of the previous period and the new unemployed entering in the current period have the same chance to become employed. This implies that the outflow rate from short-term to long-term unemployment, $o^n$, is given by:

$$o^n = u_{i-1}^s - \frac{u_1^s}{1 + u_1^s} \cdot o^s$$  \hspace{1cm} (9)

where $u_s^s$ represents the short-term unemployment rate, $i$ the inflow rate into unemployment, and $o^s$ and $o^n$ represent the outflow rates to employment from short-term and long-term unemployment, respectively. By definition holds:

$$\Delta u^s = i - o^s - o^s, \quad \Delta u^l = o^n - o^l$$  \hspace{1cm} (10)

which is consistent with the stock-flow identity, $\Delta u = i - o$. The above mentioned assumption with respect to the employment probability can be formalized as follows:
\[
\frac{o^i}{u^i} = \beta \frac{o^u}{u^i + i} \quad 0 \leq \beta \leq 1 \tag{11}
\]

Combining equations (9), (10) and (11) yields a relationship between the share of long-term unemployment in total unemployment, \(z = u^i/u\), the rate of change in unemployment and the unemployment-vacancies ratio (substituted for the duration of unemployment).\(^{28}\) From this relationship the following restrictions can be derived:

\[
0 < \frac{\partial \ln z}{\partial \ln z_1} < 1, \quad -1 < \frac{\partial \ln z}{\partial \Delta \ln u} < 0, \quad 0 < \frac{\partial \ln z}{\partial \ln (u/v)} \tag{12}
\]

The first restriction introduces elements of persistence in long-term unemployment since its share in total unemployment depends positively on the share in the previous period - as might be expected this occurs as long as \(\beta < 1\). The second restriction indicates that this share depends negatively on the growth rate of unemployment. That is, given the \(u/v\)-ratio of unemployment an increase in unemployment will first lead to an increase in short-term unemployment and hence to a decrease in the share of long-term unemployment. The third restriction is intuitively clear when one realizes that the unemployment-vacancies ratio has a positive impact on the duration of unemployment, whereas a higher duration will induce a larger share of long-term unemployed (longer than one year) in total unemployment.

For analytical and estimation purposes we shall further use a loglinear first-order Taylor approximation of this relationship around \(z_1 = z = z^*, u_1 = u\) and \(u = v\). This yields:

\[
\ln z = \ln z^* - \mu_1 \Delta \ln u + \mu_2 (\ln z_1 - \ln z^*) + \mu_3 \ln (u/v) \tag{13}
\]

where the restrictions on the coefficients follow from the elasticities in equation (12). In this equation \(z^*\) is the equilibrium steady state share of long-term unemployment, i.e. the share consistent with equilibrium on the labour market in the steady state. The stability of this equilibrium is guaranteed by the condition \(0 < \mu_2 < 1\).

Implicitly the above analysis refers to a micro-market on the labour market and the aggregate function should be derived by aggregating over all micro-markets. We have not yet found a satisfactory way of doing so, however. Therefore we will fall back to aggregation by analogy and use the specification of equation (13) also at the aggregate level.\(^{29}\)
4.3 Persistence in structural unemployment

Equations (8) and (13) now form a loop according to which unemployment feeds itself over time, even in a situation of equilibrium on the labour market. An increase in previous unemployment leads to a decrease in employment and hence an increase in structural unemployment due to increases in the variance of demand and supply over micro-markets. Simultaneously long-term unemployment will increase, which reduces the effective labour supply and hence also increases structural unemployment. Moreover, long-term unemployment in the next period also increases. However, it can be shown that this process tends to a stable steady state equilibrium.

This equilibrium can be found by substituting in equation (8) \( u_{1} = u^{**} \) and \( u^{t} = z^* u \), which gives:

\[
 u^{**} = \Theta(u^{**}) \ln\left\{ 1 + (1 - z^* u^{**})^{\frac{\alpha_{0}}{\alpha_{1}}} \right\} \tag{14}
\]

with \( \Theta(u^{**}) = \Theta_0 + \Theta_1 u^{**} \). Hence in the steady state the structural rate of unemployment is \( u^{**} \) and the rate of long-term unemployment is \( u^{**} = z^* u^{**} \).

**Figure 9**

Structural unemployment in the steady state
One can derive that $u^{**}$ will shift upwards when $\alpha$, $\Theta_0$, $\Theta_1$ or $z^*$ increases. As a consequence steady state equilibrium unemployment tends to increase when:

- the effectiveness of labour supply is further reduced at a certain level of long-term unemployment,
- the share of long-term unemployment in total unemployment tends to be higher,
- the impact of lagged unemployment on the variance over micro-markets is stronger, and
- the variance over micro-markets increases due to other factors.

And from the analysis above it follows that this steady state equilibrium share of long-term unemployment, $z^*$, will increase when:

- the employment probability of long-term unemployed decreases relative to that of short-term unemployment,
- the duration of unemployment, $d^*$, increases.

The interaction between structural unemployment and long-term unemployment is elaborated in Figure 9. The right-hand side of that figure depicts equation (8) as a relationship between $u^*$ and $u_1$ for a given value of $u^t$. In the left-hand side of Figure 5 this equation is presented as a relationship between $u^*$ and $u^t$ for a given value of $u_1$. Moreover, the steady-state share of long-term unemployment is indicated. Essentially stability of structural unemployment occurs in the right-hand side of the figure because the line representing equation (8), line AB, cuts the 45-degree line from above, whereas it occurs in the left-hand side because its analogue, line CD, cuts the line corresponding to $z^*$ from above. Moreover, the interaction between both sides of the figure will guarantee that the process depicted in both sides tends to the same level of structural unemployment. We shall elaborate this below.

4.4 Empirical results

In the empirical analysis we have estimated both the employment function specified as follows:

$$ E = \{(N^h)^{100} + [(1-u^t)^{.N^h}]^{100}\}^{0.6}, \Theta = \Theta_0 + \Theta_1 t + \Theta_2 \ln(u_1) $$

(15)

and the long-term unemployment relationship of equation (13), with some terms added to the latter to capture the dynamics better. The estimation results are presented in Tables 1 and 2 for the period 1962-1986. In both cases we have used two sets of data for vacancies. One set is registered vacancies and the other set is consistent with the survey-data collected by the Central Bureau of Statistics - see Figure 7 above.

With respect to the employment function a satisfactory fit has been obtained, one sees from Table 1 that the Durbin-Watson statistic is rather low, however.
Our strong feeling is that this can be improved by a better specification of the structural factors that influence the variance of the distribution over micro-markets. These factors are now captured by a time-trend in addition to lagged unemployment: we have added a time-trend from 1969 onwards to the specification of \( \Theta \) in equation (4). Moreover, we took the logarithm of lagged unemployment instead of its level, as it yielded more satisfactory estimation results. It also turns out that the parameter estimates are quite stable.

From the results presented in Table 1 four observations can be made. First, lagged unemployment has a significant impact on the variance of the distribution over micro-markets and hence should be included in the specification of the employment function. A second observation is that the time-trend starts in 1969, this is consistent with the widely observed outward shift in the Netherlands in the relationship between unemployment and vacancies from the mid-sixties onwards. But since the trend is only about 0.1 per cent per year, it is much lower than usually is observed. This can be attributed to the partial exclusion of long-term unemployed from labour supply, which also brings us to the third observation: Long-term unemployment reduces effective labour supply, although not to the full extent. In all cases a test against \( \alpha \) equals unity was rejected. However, it is remarkable that the estimated value of \( \alpha \) differs strongly when we use the registered data on vacancies (\( \alpha = 0.47 \)) or the corrected data (\( \alpha = 0.86 \)). This difference is by far the most remarkable difference between the estimation results, which is our fourth observation. For the moment being the explanation of this difference is a matter of further research.

| Table 1 |
The CES-employment function (15), 1962-1986

<table>
<thead>
<tr>
<th></th>
<th>( \Theta_\alpha )</th>
<th>( \Theta_1 )</th>
<th>( \Theta_2 )</th>
<th>( \alpha )</th>
<th>DW</th>
<th>lnL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(/100)</td>
<td>(/100)</td>
<td>(/100)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Registered Vacancies</td>
<td>3.949</td>
<td>0.131</td>
<td>0.261</td>
<td>0.474</td>
<td>1.34</td>
<td>144.235</td>
</tr>
<tr>
<td>Corrected Vacancies</td>
<td>4.809</td>
<td>0.110</td>
<td>0.352</td>
<td>0.864</td>
<td>1.18</td>
<td>136.785</td>
</tr>
</tbody>
</table>

* standard errors between parentheses

With respect to the explanation of long-term unemployment a good fit is obtained, as can be seen from Table 2. We must admit that the dynamic structure is
specified on a rather ad-hoc data-determined basis,\textsuperscript{36} but the long-run results were rather insensitive to the specification of the dynamics. Moreover, the parameter estimates are stable.

From Table 2 one sees that the estimated parameter values satisfy the constraints on three elasticities in equation (12).\textsuperscript{37} These restrictions are summarized in the long-term unemployment equation (13). The first two restrictions imply that the parameters of $\Delta \ln u$ and $\ln(u/u')$, should lie between -1 and 0, which obviously is the case. Moreover, the unemployment-vacancies ratio indeed does have a positive impact on the share of long-term unemployment, as we assumed above. With respect to the long-run results implied by the estimation results, we find that the steady-state equilibrium share of long-term unemployment is about 21 per cent.

<table>
<thead>
<tr>
<th>Table 2</th>
</tr>
</thead>
</table>

**Short-run:**

$$\Delta \ln(u^t/u) = -0.447 - 0.836 \Delta \ln U - 0.412 \Delta \ln V_4$$

$$-0.260 \ln(u^t/u)_t + 0.103 \ln(u/v_t)$$

$$R^2 = 0.841$$

$$DW = 2.01$$

<table>
<thead>
<tr>
<th>Long-run:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Registered Vacancies:</strong> $\ln(u^t/u) = -1.72$ + 0.40 $\ln(u/v)$</td>
</tr>
<tr>
<td>Mean lag: 2.85</td>
</tr>
<tr>
<td><strong>Corrected Vacancies:</strong> $\ln(u^t/u) = -1.55$ + 0.48 $\ln(u/v)$</td>
</tr>
<tr>
<td>3.16</td>
</tr>
</tbody>
</table>

* Registered vacancies only, standard errors between parentheses.

The most interesting observation with respect to the estimation results is that the unemployment-vacancies ratio definitively can be regarded as a significant factor in the explanation of long-term unemployment, also in the long run. We highlight this point since we have not seen similar results elsewhere.\textsuperscript{38} The importance of the impact of the unemployment-vacancies ratio is illustrated in Figure 10 where
both the actual observations on $\ln(u'/u)$ and $\ln(u/v)$ and the long-run relationship, i.e. ignoring lags, between both (see Table 2) are plotted. From this figure one sees that there are strong cyclical movements in the short-run relationship, but that in the long run a clear positive relationship can be distinguished.

Using the results presented in Tables 1 and 2 we can calculate the rate of structural unemployment according to equation (8) and its semi-steady state counterpart according to equation (14).

The results are presented in Figure 11 for survey data on vacancies. From the figure one sees that the rate of structural unemployment increases slowly from between 2 and 3 per cent in the sixties till about 4 per cent in 1980 and stabilises around 5 per cent from 1984. The semi-steady state rate is 2.7 per cent in the sixties and increases slightly till 4.1 per cent in 1988.

![Figure 10](image)

**Figure 10**
Long-term unemployment and the $u/v$-ratio

It is interesting to observe in Figure 11 that the trend in the employment equation only causes a rather small increase in the semi-steady state rate of unemployment. This is due to the low values which were estimated for this trend, as we observed in Table 1. Moreover, one sees that the level of structural unemployment varies around its semi-steady state counterpart till the mid-seventies, but increases afterwards. This occurs in particular after 1980 when unemployment increases sharply. The divergence between the rate of structural unemployment and its steady state counterpart can be explained from Figure 12 which is an elaboration.
of Figure 9.

In the first quadrant of that figure equation (8) is presented conditional on the one hand on the steady state value of $u^*/u$ of 0.21 and on the other hand on the relevant value for the late eighties of 0.5. The corresponding values of $u^*$ lie around 0.04 and 0.05, respectively. In the second quadrant of the figure we present equation (8) conditional on $u_1 = 0.04$ and $u_1 = 0.05$, respectively, together with $u^{**} = z^*, u^*$. Now one sees that the rate of structural unemployment in the eighties of 5 per cent clearly represents a disequilibrium position in relation to long-term unemployment, since at that level in the second quadrant of Figure 12 long-term unemployment lies to the left of its steady state value. That is, the steady state rate is much lower and therefore long-term unemployment will start to decline. As a consequence equation (8) in the first quadrant will shift downwards, since it is conditional on long-term unemployment. In its turn this implies a lower level of structural unemployment. But at that lower level of structural unemployment, both equation (8) will have shifted to a lower level in the second quadrant and the steady state rate of long-term unemployment is also lower. This process will continue till the rate of structural unemployment, $u^{**}$, and the rate of long-term unemployment, $u^*$, in Figure 12 are reached.

Figure 11
Structural unemployment, with corrected vacancies

![Graph showing structural unemployment with corrected vacancies](image)
However, for the moment being we are in a state of disequilibrium with a relatively high rate of structural unemployment. The reason for this is that other feedbacks in the system, some of which have been discussed in the previous section, cause negative impulses on unemployment and therefore tend to increase structural unemployment above its semi-steady state level. Moreover, unemployment and vacancies diverge strongly as we saw in Figure 7 above.

When I briefly look at the implications of the above analysis for economic policy, two points should be noted. First, long-term unemployment reduces effective labour supply and therefore increases structural unemployment. Lagged unemployment has a positive impact on structural unemployment too, since it increases the variance of demand and supply over micro markets. Moreover, it has an indirect influence since it will increase the unemployment-vacancies ratio, which in its turn influences long-term unemployment positively. Thus 'negative shocks' to 'the system' tend to increase structural unemployment, which shows a tendency to rise anyhow. Since both long-term unemployment and lagged unemployment are high, the rate of structural unemployment is high too - it lies between 6 and 8 per cent, depending on the measurement of vacancies. Structural unemployment is 50 to 100 per cent higher than when the labour market is in a 'normal' state, i.e. a state in which unemployment and vacancies fluctuate around each other. Thus in order to enhance a reduction of structural unemployment, strong 'positive shocks' should be administered.

The second point is that long-term unemployment is almost three times as high
as its 'normal' level of 21 per cent of total unemployment. This is also caused by
the high level of (lagged) unemployment, in particular in relation to that of
vacancies. Therefore a reduction in unemployment should lead to a much stronger
proportional reduction of long-term unemployment. This may be a very important
insight, in the light of the seriousness of the problem of long-term unemployment.
Not only special policy measures directed towards long-term unemployment should
be considered, but also a straightforward policy against unemployment in general.
The lags involved in the adjustment process are considerable, however.

5 Cures to high unemployment

The serious nature of the unemployment problem has been sketched in section 2
and needs not to be elaborated here. This problem has to be cured and therefore
to be analysed carefully. Now I have already warned in the introduction that the
analysis of unemployment presented above is of a partial character. It is based on
an analysis of the production structure, which is described by a putty-clay vintage
model, and an analysis of the employment function.

In the vintage model high real wage costs and stagnation in investment demand
reduce classical demand for labour. In section 3 I argued that the impact of a
persistent low rate of capacity utilization should also be included in the analysis.
In the early eighties this induced additional scrapping of equipment and hence had
a negative effect on classical demand for labour. This negative effect will of
course be enhanced by the negative effect of low capacity utilization on
investment. Moreover, it is obvious that Keynesian demand for labour will
decrease when the utilization rate falls.

The employment function can be used to measure structural unemployment.
Long-term unemployment has a positive impact on structural unemployment since
it reduces effective labour supply, as is shown in section 4. Structural
unemployment is also positively related to unemployment in the past, since that
tends to increase the variance of demand and supply of labour over micro
markets. Moreover, lagged unemployment has a positive influence on long-term
unemployment as it tends to increase the unemployment vacancies ratio. Therefore
it also influences structural unemployment indirectly in a negative way. Thus the
increase in the rate of unemployment in the early seventies caused an increase in
both structural and long-term unemployment above its semi steady-state level, and
the negative shocks due to decreases in Keynesian and classical demand for labour
induced an increasing divergence of structural unemployment from its steady-state
level till 1984.

From the description of the Dutch situation in section 2 and the analysis in
sections 3 and 4, the following picture emerges. After 1970 output growth slowed
down and investment stagnated. This ushered in a period of stagnation which
continued till 1984. During this period demand for labour stagnated, with a
tendency to decrease, and unemployment rose sharply, since labour supply
continued to grow. Output and investment growth picked up after 1984 and unemployment started to decline. However, during the long period of stagnation, unemployment became so large that it got its own momentum, which also showed up in the increasing share of long-term unemployment. And therefore it is not sufficient that investment and demand for labour started to grow again in 1984, and did return to the pre-1970 pattern with respect to output growth. Output growth will have to increase more, too. And then one may hope that the upward momentum in unemployment can be reversed. Moreover, demand for labour can be stimulated by moderating increases in wage costs. This should not be put to its extreme, however, for reasons which fall outside the scope of the previous analysis.45

I am afraid that this is as far as I can go on the basis of my analysis: I warned the reader already in the introduction for the partial character of the analysis - and the result is that not much can be inferred from it in terms of clear policy prescriptions. However, the analysis highlighted the importance of avoiding persistent low capacity utilization and the possibility of reducing long-term unemployment, simply by reducing unemployment. Moreover, some indications are given on the nature of unemployment. Roughly speaking, in 1988 about a third of unemployment consists of structural unemployment, somewhat less of Keynesian unemployment and somewhat more of Classical unemployment. But the above analysis showed that all three kinds of unemployment can be reduced by stimulating output growth, which should also lead to growth in investment.

The above analysis is in the disequilibrium tradition. That implies that market forces alone are hardly expected to solve the unemployment problem within a reasonable amount of time. Therefore I think we have to rely on economic policy measures to solve the unemployment problem. And I think that in applying such measures we should not be afraid to rely on a strong stimulus from increasing effective demand, which will increase the utilization rate (which still is low in non-manufacturing, see Figure 6). 46 Investment then might be expected to increase too, in particular when wage costs can be kept within bounds. In that respect a mild inflation would create room for income policy and therefore inflationary pressure should not be avoided at all costs (from the past we have learned that these costs can be very high). Moreover, the surplus on the current account also provides no barrier to demand stimulation.

Recent experience with budgetary policy has shown that an increase in output growth generates unexpected high tax income. For that reason I think that demand should be stimulated by a reduction of income taxes, which also has a moderating effect on wage increases. Reduction of government expenditures should not have a high priority, but the composition should change towards more investment expenditures (including education). When these measures succeed in triggering off a higher growth in output, I think that the problem of government debt will disappear gradually. Of course one should be aware, however, of the strong limits to independent economic policy in the Netherlands due to the openness of the
Dutch economy. For that reason one should also aim at a successful policy coordination at an European level.

It is obvious that since these suggested cures are sketchy and at best only remotely based on my previous analysis they are rather off the cuff. But by suggesting these cures I hope at least to provoke a discussion on the cures of unemployment, although in this conference that will hardly be necessary. And then I can contribute to such a discussion with the elements I have presented above.
Notes

1. University of Limburg, Department of Economics. I did benefit much from discussions with and comments of Erik de Regt. I also thank Franz Palm for his useful comments. Of course non of the errors in the paper can be attributed to these comments.

2. This problem of the identification of causes is stressed by Sneessens and Drèze (1986).

3. Strictly speaking, employment is explained by both demand for labour and labour supply, as we shall elaborate when we discuss the employment function below. However, in particular in the period after 1970 employment lies much closer to demand for labour (employment plus vacancies) than to labour supply - unemployment exceed vacancies to a large extent.

4. The transformations are \( e^{32.34 \cdot (empl)^{1.5}} \) and \( e^{26.1 \cdot (inv)^{0.53}} \), respectively.

5. Labour productivity is scaled to the 1965 level of wage costs, i.e. for the whole period it is multiplied by a factor 2.8.

6. In the figure we multiplied the rate of capacity utilization in manufacturing by a factor 1.16 to make its level comparable to the overall rate.

7. These data are used by the Central Planning Bureau, cf. Gelauff, Wennekers and de Jong (1986). It is remarkable, however, that the data used nowadays are distinctly higher for the period after the first oil-crisis than those published by Gelauff, Wennekers and de Jong. This may be due to difficulties in applying the peak-to-peak interpolation method in the rather hectic period 1970-1985. The data therefore should be interpreted with care.

8. This low level may partly be due to measurement errors using the peak-to-peak interpolation method, see also the previous note.

9. It is tempting to detect a flavour of hysteresis here. To a certain extent this is consistent with the capital shortage explanation of hysteresis.

10. Data on registered unemployment have also been criticized on various grounds. However, the Central Planning Bureau recently argued that when the international definition of unemployment is followed, unemployment lies rather close to registered unemployment (CEP 1989, pp. 94-95). This also holds for the unemployment data on the Netherlands, published by the US Bureau of Labour Statistics - cf. de Neubourg (1988, p. 21).

11. In that analysis it was called quantitative structural unemployment (due to lack of productive capacity) and cyclical unemployment, respectively.


14. A similar conclusion is found by Gelauff, Wennekers and de Jong (1985). One should realise, however, that the data used on the rate of capacity utilization in the eighties were biased downwards. But tentative experiments
with the new data on capacity utilization showed similar results. Cf. Meijers (1989).

15. Conform the result of Muysken and van Zon (1988, p.108) I took $\gamma$ to be equal to 0.38. Sneessens and Drèze (1986) found a value of 0.27.

16. This means that vacancies are interpreted as Keynesian demand for labour minus employment, even if classical demand for labour lies below Keynesian demand - I will elaborate this when I discuss the underlying structure of micro-markets below. Of course, it is more elegant to derive Keynesian demand for labour from aggregate demand, as is done in Sneessens and Drèze (1986).

17. This section is based on Muysken and de Regt (1990).


19. This choice is motivated in Muysken and Meijers (1989).

20. The interpretation of vacancies as Keynesian demand for labour now can be further motivated. It is obvious that it does not hold in a situation of increasing classical demand for labour on a micro market. If in such a situation classical demand still lies below Keynesian demand, this will induce a corresponding increase in vacancies. In a situation of declining classical demand for labour, this will be different, however. For in that case, labour hoarding will occur, as can be seen from equation (1). And if classical demand for labour lies below Keynesian demand, there simply will be no vacancies. Therefore in such a situation all vacancies will correspond to Keynesian demand for labour minus employment. Since the latter situation is dominant from the early seventies on (see Figure 8) this interpretation at least is justified since that period.

21. Actually one can also use a CES-employment function with three arguments, distinguishing between classical and Keynesian demand for labour. Cf. for instance Sneessens and Drèze (1986) and, for a further elaboration, Bierings and Muysken (1989). And this then also provides a direct link to classical and Keynesian unemployment.

22. Strictly speaking this holds when unemployment has risen with respect to vacancies.

23. The specification of this term often is on an ad hoc basis, in particular its dynamic structure. Further research is necessary here.

24. This is approximately equal to $u^{**} = (\Theta_\nu \ln 2)/(1 - \Theta_\nu \ln 2)$ and this process is stable when $\Theta_\nu \ln 2 < 1$, which we assume to be the case. One sees that the presence of the lagged term increases the level of structural unemployment above $\Theta_\nu \ln 2$, which it would be without such a term.

25. The steady state equilibrium unemployment $u^{**}$ is implicitly defined by substituting $u^* = u = u^{**}$ in equation (8). It obviously is conditional on a given value of $u^\nu$. When $u^\nu$ increases, a higher value of $u^{**}$ will be found.

26. This assumption is in line with the duration theory in the hysteresis literature. In Muysken and de Regt (1990) we show that approximately holds $\alpha = 1-\beta$.

27. Provided that $\alpha \geq i, \; u^*_{i+1} + \beta u^\nu$. 
28. The $u/v$ ratio is introduced in order to account for the impact of the duration of unemployment, $d = u/i$. A positive relationship between both is assumed [See also Knight (1988), Ch. 2]: $\ln d = \ln d^* + \delta \ln(u/v)$, $\delta > 0$. This is elaborated in Muysken and de Regt (1990).

29. In Muysken and de Regt (1990) we point out that the restriction mentioned in note 26 above may be violated for some micro markets. In those cases a value of $z$ will be generated according to equation (13) that exceeds unity, whereas $z=1$ should hold then. The proportion of micro markets for which this condition will be violated varies inversely to the ratio of unemployment over vacancies. This implies that when equation (13) is estimated at an aggregate level, the estimated value of $\mu$ will be downward biased.

30. That we did not estimate from 1950 onwards is due to the peculiar behaviour of long-term unemployment in the period 1950-1960: both unemployment and long-term unemployment are very low in that period, but the ratio of $uL/u$ is quite high. We used the data on 1987 and 1988 to test for the predictive power of the estimated specification.

31. A relatively low value of the Durbin Watson statistic is consistently found by anybody estimating this type of unemployment function for whatever country - for instance see the various estimation results presented in Bean and Drèze (1990).

32. When a first-order autoregressive process is assumed, the Durbin-Watson statistic still remains low.

33. We have tested both for a structural break in 1985 - being the first year in the eighties where unemployment started to decrease - and for predictive accuracy of our model using the last two available observations (1987-1988).

34. This influence which was introduced in Lambert (1988), is often ignored. See for instance Sneessens and Drèze (1986), who only use a time trend and a dummy variable.

35. Therefore the assumption of Driehuis (1990) that $\alpha=1$ is not justified. However, when his constructed demand for labour lies close to employment plus corrected vacancies (and not registered vacancies) our results do not diverge strongly since in that case we find $\alpha = 0.86$.

36. While estimating the long-term unemployment equation, we started from an unrestricted specification with two lags for each variable. The four restrictions implied by the parsimonious specification presented in Table 2 are not rejected. These restrictions include a homogeneity restriction of the steady state solution, i.e. the steady state of long-term unemployed only depends on the ratio of unemployed to vacancies. No separate influence of lagged unemployment could be found.

37. It is not surprising that the estimated parameter values hardly differ when survey data are used in stead of registered ones, for growth rates and shares change only little when different data are used.
38. Following the approach of Layard and Nickell (1986), all authors relate long-
term unemployment only to total unemployment in a dynamic setting. For the
Dutch studies the implied steady state results are roughly:
Driehuis (1990): $u^* = 0.34u^n$
Van Esch (1988): $u^* = -0.01 + 0.3u + 2u^n$
Kapteyn cs. (1989): $U^n = U - 68$ (in levels x 1000)
whereas Layard and Nickell (1986) find
$u^* = 0.3u + 2u^n$
for the British labour market. The steady-state shares of long-term
unemployment at a unemployment level of 5% are 0.17 for Driehuis (1990)
and 0.22 for van Esch (1988).

39. The figure uses data on survey vacancies. The steady-state regression line is
conditional upon $\Delta \ln(u^n) = \Delta \ln(u/v) = 0$. With positive average growth rates
during the estimation period, this condition is clearly violated. This explains
the upward bias in the steady-state regression line.

40. The underlying relationship between the unemployment-vacancies ratio and
the share of long-term unemployed is represented by the straight line in
Figure 10. This line is consistent with the steady state share, $z^*$, cf. equation
(13). From the figure one sees, however, that for high values of the $u/v$ ratio
an extrapolation of this straight line will lead to values of the share of long-
term unemployment that exceed unity. This is an unfortunate result of the
specification of the equation. Therefore we also estimated the equation in a
logistic form - that is, replacing $\ln z$ by $\ln [z/(1-z)]$. This yielded similar
estimation results compared to those presented in Table 2. The resulting long-
run relationship between the unemployment-vacancies ratio and the share of
long-term unemployed is represented by the curved line in Figure 10.

41. We use the term semi-steady state instead of steady state because of the
presence of the trend term in the steady state results.

42. The results found when employing registered vacancies are quite similar,
although the difference between $u^{**}$ and $u^*$ is larger.

43. One sees that equation (8) hardly shifts due to changes in $u_{1}$. A change in $u_{1}$
by a factor of 1.5 changes $\Theta$ only with a factor of 0.02 for values of $u_{1}$
around 4 per cent.

44. A feedback that typically should be included in an extension of the present
analysis is the impact of increased unemployment on wages and hence on
demand for labour. This "feedback" may be mitigated by the notion that long
term unemployment also is not (entirely) effective in reducing wage-
demands - nonetheless it exists [See f.i. Lindbeck and Snower (1986) and
Graafland and Huizinga (1988)]. However, in this analysis we stress other
aspects of the so-called hysteresis discussion than wage-formation.

45. In this respect I do not primarily think about negative repercussions on
effective demand of low real wages, but more about the fact that too strong a
moderation is bound to create social unrest. The reason is that real wages
hardly have risen since 1980, as can be seen from Figure 5 above. The figure
also shows, however, that there still is a gap between real wage costs and labour productivity compared to the mid-sixties. On the other hand, the share of labour income in national income is back to its 1965 level.

46. This should be accompanied by an active labour market and schooling policy.
References


--------; de Regt, E. *Persistence in structural unemployment*, Research


