

The Beveridge Curve and Institutional Arrangements



Willem Adema

Final draft: January 1993.

Submitted in fulfilment of the thesis requirement for the degree of
Doctor of Philosophy at the University of Oxford.

voor mijn Vader en Moeder

Contents.

	title	page
	Abstract.	v
	List of Tables.	vi
	List of Figures.	viii
	Acknowledgements.	ix
1.	Introduction.	1
2.	Theoretical Aspects of the <i>Beveridge Curve</i> .	
2.0.	Introduction.	7
2.1.	The Matching Principle.	9
2.2.	The <i>Beveridge Curve</i> : the Basic Model.	13
2.3.	The Importance of a Shift of the <i>Beveridge Curve</i> .	20
2.4.	The <i>Beveridge Curve</i> and Long-term Unemployment.	
2.4.1.	Long-term Unemployment Effects.	26
2.4.2.	The Basic Model Extended.	32
2.5.	The <i>Beveridge Curve</i> and Hidden Unemployment.	38
	Appendix to chapter 2.	43
3.	Labour Market Developments in Great Britain, the Netherlands and Sweden.	
3.0.	Introduction.	46
3.1.	The Data.	
3.1.1.	Unemployment Data.	48
3.1.2.	Vacancy Data.	55
3.2.	Patterns in Unemployment and Vacancies.	61
3.3.	Mismatch Indices: Empirical Evidence.	81
3.4.	Long-term Unemployment Ratios: Empirical Evidence.	86
4.	Particular Social Welfare Institutions.	
4.0.	Introduction.	99
4.1.	Social Welfare Systems: Some Indicators.	101

4.2.	Particular Aspects of the Dutch Social Welfare Institutions.	
4.2.1.	The Disability Insurance System.	111
4.2.2.	Disability: the Hidden Unemployment Component.	130
4.3.	Particular Swedish Institutional Arrangements.	
4.3.1.	Swedish Labour Market Policies.	143
4.3.2.	Swedish Disability Pensioning.	152
4.4.	British Sickness and Disability Regulations.	162
4.5.	Disability: an International Comparison.	184
5.	The <i>Beveridge Curve</i> : Econometric Analysis.	
5.0.	Introduction.	190
5.1.	Stationarity and Cointegration.	193
5.2.	Dutch Model Specifications.	
5.2.1.	The Dutch <i>Beveridge Curve</i> .	205
5.2.2.	The Unmeasured Unemployed and the Dutch <i>Beveridge Curve</i> .	219
5.2.3.	Explaining Dutch Long-term Unemployment.	229
5.3.	Swedish Model Specifications.	
5.3.1.	The Swedish <i>Beveridge curve</i> .	245
5.3.2.	The Adjusted Swedish <i>Beveridge Curve</i> .	250
5.3.3.	The Unmeasured Unemployed and the Swedish <i>Beveridge Curve</i> .	253
5.4.	British Model Specifications.	
5.4.1.	The British <i>Beveridge Curve</i> .	257
5.4.2.	Explaining British long-term unemployment.	269
5.5.	Summary.	276
	Appendix to chapter 5.	278
6.	The <i>Beveridge Curve</i> : a Countrywise Comparison.	
6.0.	Introduction.	290
6.1.	Structural Change and Declined Search Effectiveness.	291
6.2.	Disability Arrangements.	299
6.3.	Long-term Unemployment Patterns.	304
6.4.	Summary.	310
7.	Epilogue.	318
	List of References.	326

The Beveridge Curve and Institutional Arrangements.

Willem Adema

Submitted for the D.Phil. degree

St. Edmund Hall

Hilary term 1993

Abstract.

The main objective of our analysis is to investigate the causes of shifts of the *Beveridge curve* in Great Britain, the Netherlands and Sweden.

In chapter 2., we will outline the model which is the basis for our analysis. The cornerstone of our theoretical framework regarding the long-run relationship between unemployment and vacancies otherwise known as the *Beveridge curve* is the matching process. We will describe how certain features such as structural mismatch, the relative attractiveness of benefit provisions and changes in search intensity and search effectiveness of the unemployed, could theoretically affect the *Beveridge curve*.

In order to analyse a possible shift of the Beveridge curve, time series analysis will be used. In chapter 3., we describe the patterns of the relevant data series. Also, we describe the significance of the long-term unemployment problem in Great Britain and the Netherlands.

In the following chapter we describe the characteristics of the disability arrangements in the three relevant countries. We do this in order to explain how the disability arrangements have affected the unemployment patterns in one of our sample countries. The focal point is the existence of a hidden unemployment component in the disability stock.

In order to estimate the Beveridge curve for each country, we will use the instrumental variables technique. In chapter 5., after first having tested for the suitability of our econometric practice regarding the data series in the context of the theory of cointegration, we will present and discuss several model specifications regarding the *Beveridge curve*. We will also test for the sensitivity of our main results to variations in data and estimation method. Also, we present models of the British and Dutch long-term unemployment patterns.

In chapter 6., we will discuss the most relevant results and compare the British, Dutch and Swedish labour market experiences. Conclusions are presented in the final chapter.

List of Tables.

table	title	page
1.	Comparison of Dutch Unemployment Figures.	51
2.	Vacancy Correction Factor Great Britain.	57
3.	Comparison of Dutch Vacancy Figures.	58
4.A.	Patterns of Unemployment and Vacancies.	64
4.B.	Patterns of Unemployment and Vacancy Rates.	65
4.C.	Adjusted Vacancy Rates.	66
5.A.	Patterns of Employment and the Labour Force.	73
5.A.	Indexed Patterns of Employment and the Labour Force.	74
6.	u/v Ratios.	77
7.	Mismatch Indices.	82
8.	Long-term Unemployment Ratios.	88
9.A.	Means w.r.t. Dutch Long-term Unemployment Measures.	91
9.B.	British Long-term Unemployment Measures.	93
10.	Characteristics of Long-term Unemployment.	96
11.	Government Expenditure and Social Security Transfers.	102
12.	Public Expenditure on Labour Market Programs.	105
13.	Replacement Ratio Patterns.	109
14.	The Netherlands: Labour Unsuitability Patterns.	122-123
15.	Adjusted Dutch Unemployment Patterns.	136-137
16.	Dutch Long-term Unemployment Patterns (Unadjusted and Adjusted).	141
17.	Sweden: Labour Market Programs.	150
18.	Sweden: Disabled Pensioners.	156
19.	The Swedish Unmeasured Unemployed.	160
20.A.	Patterns of British Disability.	178
20.B.	Adjusted British Unemployment Patterns.	181

21.	Patterns of Disability Ratios.	186
22.	Unit Root Tests for Unemployment and Vacancies.	198
23.	Tests on Cointegration.	202
24.	Robustness of Model Specification (NL7.).	225
25.	The Impact of British Unmeasured Unemployment.	267
A1.	Model Specification (NL1.).	278
A2.	Model Specification (NL5.).	279
A3.I.	Model Specification (NL7.).	280
A3.II.	Model Specification (NL7.) continued.	281
A3.III.	Model Specification (NL7.) continued.	282
A3.IV.	Model Specification (NL7.) continued.	283
A4.	Model Specifications (SV1.) and (SV4).	284
A5.	Model Specifications (SV5.) and (SV5).	285
A6.	Model Specifications (GB1.) and (GB2).	286
A7.	Model Specification (GB6.).	287
A8.I.	British Unmeasured Unemployment Model Specifications.	288
A3.II.	British Unmeasured Unemployment Model Specifications continued.	289
26.	Explaining Unemployment Patterns at Constant Vacancies (Percentage Point Changes in Unemployment).	294
27.	Explaining Unemployment Patterns with 'Disability' at Constant Vacancies (Percentage Point Changes in Unemployment).	300
28.	Explaining Long-term Unemployment Patterns (Changes in the Long-term Proportion).	305-306
29.	Explaining Dutch Unemployment Patterns at Constant Vacancies (Percentage Point Changes in Unemployment).	315

List of Figures.

figure	title	page
1.A.	Dutch Unemployment and Vacancies Patterns.	62
1.B.	Swedish Unemployment and Vacancies Patterns.	62
1.C.	British Unemployment and Vacancies Patterns.	63
2.	British (Corrected) Vacancy Rates.	70
3.A.	British, Dutch and Swedish Vacancy Rates.	72
3.B.	British, Dutch and Swedish Unemployment Rates.	72
4.A.	The Dutch <i>Beveridge Curve</i> .	78 and 312
4.B.	The Swedish <i>Beveridge Curve</i> .	78 and 149
4.C.	The British <i>Beveridge Curve</i> .	79
4.D.	The Adjusted British <i>Beveridge Curve</i> .	79 and 312
5.	British and Dutch Mismatch Indices.	84
6.A.	British and Dutch Long-term Unemployment Ratios.	87
6.B.	The Swedish Long-term Unemployment Ratio.	95
7.	Dutch (Adjusted) Unemployment Rates.	138
8.	The Dutch Long-term Unemployment Ratio and the Hidden Unemployment Rate.	138
9.	The Dutch <i>Beveridge Curve</i> (1969 - 1990).	139
10.	The Adjusted Dutch <i>Beveridge Curve</i> .	139
11.	Dutch (Adjusted) Long-term Unemployment Ratios.	141
12.	Swedish (Corrected) Unemployment Rates.	148
13.	The Adjusted Swedish <i>Beveridge Curve</i> .	149
14.	British, Dutch and Swedish Disability Ratios.	188
15.A.	Dutch Unemployment and Vacancies (logs).	194
15.B.	Swedish Unemployment and Vacancies (logs).	194
15.C.	British Unemployment and Vacancies (logs).	195
16.	Pattern of Dutch Unemployment, Model Specification (NL7.).	223

Acknowledgements.

As those who have done it before will know, writing a D.Phil. thesis is not the easiest thing to do in life. Maybe, some social scientist with philosophical aptitude should write a thesis on why people write D.Phil. theses in the first place. Be that as it may, several factors have contributed greatly to the completion of what now lies in front of the reader.

First, and foremost, I am indebted to my supervisor, Prof. S.J. Nickell, without whose continuous support (not in the least during the final stages of this project), corrections and guidance, it would have been impossible to present this thesis in its present form. Another indispensable factor has been the British government, through the British Council, for awarding me a 'Foreign and Commonwealth Office Scholarship'. Thanks are also due to Jurgen Doornik and Prof. D.F. Hendry for enabling me to use Pc Give 7., a more powerful tool than its predecessor, even in its development phase, for econometric analysis. I am also grateful to Mike Clements for his illuminating comments regarding the theory of cointegration. Also, many thanks to George Walker and Kate Carpenter. They have done a wonderful job in spotting quite a few - what a nice English euphemism - deficiencies in my use of the English language. I will return the favour, if they ever feel the need of writing something in Dutch. Remaining errors are of course my responsibility.

Over the years I have had many useful and enjoyable conversations about economics - yes, economics can be a bit of a joke - with many people. Two of the debaters greatly deserve to be mentioned: David Armstrong and Mozaffar Qizilbash. I am very grateful for their friendship.

Of course, one does not just write a thesis in Oxford. There are so many 'distractions'. At the same time, I am convinced that without those 'distractions' writing a thesis truly becomes the struggle it is sometimes projected to be. What is one without his friends? Fortunately enough, Teddy Hall has been an extremely 'sociable' place to me. It is impossible to name them all, but without the rugby lads, the footie boys, cricketers, and those partaking in the banter in the mcr, and on several memorable occasions in the buttery, life in Oxford would not have been so thoroughly enjoyable. Thanks a lot!

Last but definitely not least, innumerable thanks are due to my loving parents, from whom I have learnt so much and who started to educate me, what now seems a long time ago.

1. Introduction.

The main objective of our analysis is to investigate changes in the structure of labour markets in Great Britain, the Netherlands and Sweden over the last three decades. In particular we shall compare and analyse the underlying reasons for the different patterns in unemployment in these countries. The motive for choosing these three European countries is that the different patterns of unemployment observed could well be due to different institutional arrangements, *i.e.* the social security system, in each country. And, as we will see, these three countries have rather different ways of operating their social security arrangements. At present we will not discuss the literature on the topics concerned, with one exception (see below), that will be done in the relevant chapters.

In order to analyse changes in labour market structure, we focus on the long-run shifts in the *Beveridge curve*. We use the *Beveridge curve* approach to analyse unemployment for a number of reasons. Aggregate unemployment and vacancies or unfilled jobs, are the most obvious indicators of aggregate labour supply and demand. Their long-run relationship is therefore a very useful tool for analysing the possible existence of structural problems in any labour market, as has been demonstrated on many occasions¹. However, as regards the empirical modelling of the *Beveridge curve* approach there are serious data problems. As we will see, vacancy data in particular can be a source of difficulty. This feature is not

¹ See, among others, Jackman, Pissarides and Savouri (1990a) and (1990b).

just restricted to vacancy data. An alternative approach might involve the analysis of wage determination, but acquiring consistent and proper data on wages for the last thirty years can be equally troublesome, especially if one wants to take account of changes in the bargaining process for instance. However, we will show below that it is not impossible to acquire reasonably reliable vacancy data which reflect the trend as regards aggregate demand for labour at the labour market sufficiently well.

The same is true for unemployment. Changes in measurement and/or definition hamper the construction of consistent time series. However, we still feel that these data reflect the trends as regards labour supply reasonably well. Moreover, we are especially interested in the 'true' size of the unemployment problem. We will make an attempt to depict the true nature of this by correcting the orthodox unemployment figures for the impact of institutional arrangements. If we are able to show that these variables affected the true *Beveridge curve*, than this will emphasize the significance of these variables, rather than just reflecting a temporary short-run effect on labour markets.

In order to analyse possible shifts of the *Beveridge curve*, time series analysis will be used on (among other variables) total unemployment, aggregate vacancies and total employment for each of the three countries. In chapter 3., we describe the patterns of the relevant data series. We will also investigate the consistency of the time series, which may be hampered by changes in definition and/or new measurement techniques, as regards the relevant variable. Adjustment of the available data may be required in order to obtain proper time series.

In chapter 2., we shall outline the model which is the basis for our analysis. The cornerstone of our theoretical framework is the matching process, *i.e.*

the process which links people with job-opportunities. The number of vacancies determine the labour market opportunities which, in their turn, determine changes in the unemployment level. The long-run relationship between unemployment and vacancies is the *Beveridge curve*. We will describe how certain features such as structural mismatch and the relative attractiveness of benefit provisions could theoretically affect the *Beveridge curve*. Also, we will describe how changes in search intensity and search effectiveness of the unemployed, indicated by fluctuations in the proportion of unemployed persons who have been out of work for at least one year, may influence the *Beveridge curve*.

Indeed, one of the most striking features of the labour market in the last decade is the huge rise in the aggregate level of unemployment. For instance, it was only in 1987 that British unemployment started to decline substantially, following the explosion in unemployment in Great Britain and the Netherlands, at the beginning of the eighties. A high inflow into the stock of unemployed persons, together with a low outflow from this stock, led to an increase in the amount and duration of long-term unemployment. The rise in long-term unemployment in the Netherlands has been quite dramatic, with the ratio of the total number of long-term unemployed to the total number of unemployed persons being greater than .5 (at its peak the ratio was .4 in Great Britain). These figures depict the importance of the long-term unemployment problem. Its impact on the *Beveridge curve* will be thoroughly investigated. Also, we investigate the pattern of long-term unemployment itself. We will try to determine which variables explain the nature of its pattern. We will try to establish the efficacy of some measures introduced to tackle the long-term unemployment problem in Great Britain and the Netherlands.

Eligibility for unemployment benefits, the level of the unemployment benefit relative to the wage rate (*i.e.* replacement ratio), the duration of the benefit, and obligations (or lack of them) of the beneficiary to the benefactor, *i.e.* the state, could all influence various characteristics of long-term unemployment and therefore aggregate unemployment. Here the question is whether or not 'intercountry' differences in institutional arrangements, explain the different patterns in unemployment. In Sweden a benefit subscriber cannot reject offers for jobs or training more than three times, otherwise he\she loses benefit. In the Netherlands the benefit system is as generous as in Sweden (in terms of money), but punishment in the case of default is both less probable and less severe. The British system is less extensive and less generous than its Dutch and Swedish counterparts. The presence of institutional differences such as these is the reason for selecting Sweden, the Netherlands and the United Kingdom, with their different unemployment patterns, as countries for research.

Nevertheless, there is another, less obvious, feature of the social welfare system which affects unemployment patterns. Therefore, in chapter 4., we will describe the characteristics of the disability arrangements in the three relevant countries. The focal point is the existence of a hidden unemployment component in the disability stock. Intuitively, this seems rather odd. Ideally, an efficiently operated institutional disability arrangement should care for those whose disabilities prevent them from providing for themselves. Nevertheless, the Dutch experience is rather different from that paragon.

Specifically, the existence of the 'Wet Arbeidsongeschiktheid' (WAO), 'the first disability or labour-unsuitability Act', in the Netherlands may have con-

tributed to the fact that the aggregate unemployment figures are not higher than they are at present. The WAO gives funds to those who, for medical reasons, do not have a 100 percent ability to work. The act, however, also states that in the determination of the degree of disability, not only the applicant's medical situation but also his\her chances of obtaining a job should be taken into account. So if the applicant's chances of getting a job are low, *e.g.* on account of being long-term unemployed, his\her chances of being classified as a person with a higher degree of disability are increased. Therefore, it is possible that some people being funded on grounds of the WAO would just be regarded as (long-term) unemployed, had the WAO not existed. Hence, the number of (long-term) unemployed people could be much higher than the actual (long-term) unemployment figures account for. Also, grants are based upon loss of earnings and not on medical disability. Hence, for the beneficiary this scheme is financially much more favourable than the 'orthodox' unemployment benefit.

The existence of long-term unemployment could maintain a high unemployment-rate for the years to come. It is important to estimate to what extent the problem is aggravated, by including those who are part of the hidden unemployment stock, *eg.* those who apply more or less unjustifiably to a scheme for the 'medically disabled'. The significance of the long-term unemployment problem, and thus the altered search intensity and search effectiveness of the unemployed, its different features in the various countries, together with other possible variables which underlie the outward shift of the *Beveridge curve*.

We will estimate the *Beveridge curve* for each country by using the instrumental variables technique (IVE). However, we will also investigate the

sensitivity of our results obtained in this manner, by reestimating our most important model specifications by OLS. In chapter 5., after first having tested the suitability of our econometric practice with regard to the data series in the context of the theory of cointegration, we will present and discuss several model specifications concerning the *Beveridge curve*. In so doing we will expose the economic factors which have significantly influenced the pattern of unemployment over the past three decades. In chapter 6., we will discuss the most relevant results and compare the British, Dutch and Swedish labour market experiences. Lastly, we will present conclusions in the final chapter.

2. Theoretical Aspects of the *Beveridge Curve*.

2.0. Introduction.

In this chapter we will outline a framework which enables us to discuss theoretical aspects of the long-run unemployment-vacancies relationship or *Beveridge curve*. Initially (see, section 2.1.), we shall discuss the characteristics of the matching process. The features of this process, connecting job-searchers with unfilled jobs, is the foundation of the relationship between unemployment and vacancies. This matching principle will provide us with the basic concepts necessary for deriving a theoretical framework for the *Beveridge curve* (see, section 2.2.).

In section 2.3., we will explain the importance of the *Beveridge curve*. The appearance of unusually and persistently high unemployment in several European countries over the last decade, along with the associated high social costs and waste of resources, seems incompatible with the notion of competitive markets, *i.e.* 'market clearing'. The concept of 'market clearing' relies very much on the absence of price (wage) inertia. The link between the *Beveridge curve* (also, its association with the equilibrium level of unemployment) and the wage determination process indicates its importance in economic analysis.

Section 2.4. contains a lengthy discussion of another empirical feature of the eighties: the increase of the average length of unemployment spells. First, we discuss the characteristics of long-term unemployment. Also, we shall focus on

some empirical problems concerning tests of the significance of long-term unemployment in shifting the *Beveridge curve*. Subsequently, the long-term unemployment feature will be embodied in our theoretical framework. Long-term unemployment is linked to the matching process: changes in matching effectiveness can be due to changes in the choosiness of the employers and/or changes in the search effectiveness and search intensity of the long-term unemployed. Also, section 2.4.2. contains a discussion of other variables which might affect the position of the *Beveridge curve*. We will look at the possible impact of mismatch, labour market policies and the social security system, *i.e.* benefit duration and the replacement ratio.

In section 2.5., we shall discuss how the existence of particular institutional arrangements, *i.e.* the social security system, in first world economies, can affect the estimation of the matching process and the *Beveridge curve* in yet another way. How these institutions affect the estimation of the 'true' *Beveridge curve* in the context of hidden unemployment will be discussed in the last section of this chapter.

2.1. The Matching Principle.

Over the last three decades both unemployment and the number of unfilled jobs (vacancies) have fluctuated substantially in most industrial countries. These fluctuations are, of course, related. Changes in the unemployment level are caused by a change in the outflow rate from the unemployment stock relative to a change in the inflow rate into the unemployment stock. These flows depend upon the labour market opportunities, which depend, in their turn, on the number of vacancies. The long-run relationship between unemployment and vacancies is known as the *Beveridge curve*.

Continuous movements of people in and out of the unemployment stock, the employment stock and the labour force, are taking place in the labour market. At the heart of these movements is a process of matching workers with jobs, *i.e.* employers and job-searchers are involved in a process of search and exchange of information with respect to jobs and potential employees¹. So, we are facing an economy in which jobs are continually created and destroyed, *i.e.* new jobs become profitable or lose their profitability, respectively. Also, employees voluntarily leave jobs (quits), due to the fact that they find better job-opportunities elsewhere; they can make a better match. So, it is not only the unemployed² who are participating

¹ For a lengthy discussion of the link between the Beveridge curve and the matching function, see Blanchard and Diamond (1989).

² For instance, see Burgess (1989).

in the search process but also the employed job-searchers. There is evidence that search (except for highly skilled workers) is no more effective when the job-searcher is unemployed than employed³. So, in this respect unemployment is not productive. For the (new) unfilled jobs, vacancies may be posted. Indeed, in some countries the public registration of vacancies is legally required. Potential employees will apply for a vacancy if the offered wage exceeds the reservation wage. When a job becomes unprofitable the worker becomes unemployed. (There is, of course, the feature of 'labour hoarding', *i.e.* to maintain, at least partly, the actual labour force size while waiting for better times. The reason for this kind of firm behaviour is generally thought to be the size of employment adjustment costs.)

The matching process links people with job-opportunities and is vital for the operation of the labour market. As stated before, matching enhances linking (new) job-searchers with (new) unfilled jobs. This is a continuous process. No matter how bad the state of the economy, employers will always be looking for people to fill vacancies due, at least in part, to the voluntary departure of employees (quits or retirements). Another characteristic of the matching process is that it takes time. It should also be noted that the matching process is not centrally organized. Firms and potential employees are continually looking for a suitable match. The employment service might help, but basically the parties who participate in the search process have to do it themselves.

In setting up the matching function it is necessary to outline some definitions and assumptions. The effective job-searchers are those who are looking for a job whilst unemployed, and those who are employed while looking for another job.

³ See Layard, Nickell and Jackman (1991), p. 235.

Therefore, the number of effective job-searchers is:

$$JS = cU + \check{c}J \quad (1.)$$

The total number of effective job-searchers is represented by JS. The average effectiveness of the unemployed job-searcher is denoted by c , whereas \check{c} represents the average effectiveness of the employed job-searcher. U is the number of unemployed persons, whereas J is the number of employed job-searchers (on-the-job searchers).

Furthermore, we suppose that the probability that an employed person will search for another job depends inversely on the number of effective unemployed competitors relative to the number of vacancies. Hence:

$$J = (cU/V)^{-\beta} E \quad , \text{ with } 0 \leq \beta < 1 \quad (2.)$$

The total number of employed persons is denoted by E , whereas V denotes the total number of vacancies. It is assumed that; $0 \leq \beta < 1$, *i.e.* the total number of on-the-job searchers is not too sensitive to labour market conditions. Consequently, the total number of effective job-searchers is:

$$JS = cU + \check{c}(cU/V)^{-\beta} E \quad (3.)$$

As pointed out above, the participants in the matching process are the job-searchers and the employers looking for potential employees. Consequently, the

number of hires depends on the number of effective job-searchers and the number of vacancies. The matching process can be described by the following general matching function:

$$M = m(cU, \check{c}J, V) \quad (4.)$$

The total number of matches, engagements or hires is represented by M . Furthermore, for simplicity we will assume the Cobb-Douglas form for the matching function. Additionally, we assume constant returns to scale. It is to be expected that more effective job-search and more vacancies lead to more new matches, *i.e.* matching depends positively on effective job-search and the number of vacancies, so $\delta M / \delta JS > 0$ and $\delta M / \delta V > 0$. However, there is no reason to believe that an increase (decrease) in the amount of effective job-search and the number of vacancies will lead to a more than proportional increase (decrease) in the total number of matches. This is the rationale for assuming constant returns to scale regarding the matching function. All this, equations (1.), (2.), (3.) and (4.), leads to the matching function below:

$$M = (cU + \check{c}(cU/V)^{-\beta}E)^{\alpha}(V)^{1-\alpha} \quad , \text{ with } 0 \leq \alpha < 1 \quad (5.)$$

The parameters c and \check{c} are of considerable analytical importance here. They reflect the effectiveness of the whole matching process. As will be discussed subsequently, changes in the values of these parameters lead to inward or outward shifts of the *Beveridge curve*.

2.2.

The Beveridge Curve: the Basic Model.

The derivation of the *Beveridge curve* is based on its link with the matching function. Given the matching function, equation (5.), we can define the hiring rate per effective job-searcher as:

$$M/(cU + \check{c}J) = (V/(cU + \check{c}(cU/V)^{-\beta} E))^{1-\alpha} \quad (6.a.)$$

By definition, an effective job-searcher is equally likely to find a job whatever his\her labour market status. Therefore, the hiring rate as shown in equation (6.a.) must be the same as the hiring rate from unemployment per effective unemployed job-searcher. Note, the outflow from the unemployment stock or the number of hires from the unemployed is denoted by O^{ue} . Hence:

$$O^{ue}/cU = M/(cU + \check{c}J) = (V/(cU + \check{c}(cU/V)^{-\beta} E))^{1-\alpha} \quad (6.b.)$$

Some additional definitions are appropriate. Let I_t^{lu} represent the (re)entrants in period t , to the unemployment stock from out of the labour force, whereas I_t^{eu} denotes the entrants into unemployment from the employment stock. Total inflow into the unemployment stock is defined as the sum of these two flows: $I_t = I_t^{lu} + I_t^{eu}$. The outflow from the unemployment stock is defined likewise; O_t^{ul} denotes the outflow from unemployment towards out of the labour force and O_t^{ue}

the outflow into employment. Consequently, total outflow from the unemployment stock is: $O_t = O_t^{ue} + O_t^{ul}$. Also:

$$U_t/(U_t+E_t) = (I_t/(U_t+E_t)) * (U_t/I_t) \quad (7.)$$

This points out that the unemployment rate depends on the inflow rate into unemployment and the average length of the unemployment spell. Further, $I_t^{eu} = k_t E_t$, where k_t is the inflow rate from employment into unemployment.

Focusing on the relationship between unemployment and vacancies, we can state that in equilibrium there is an inverse relationship between unemployment and vacancies. For instance, when there are less vacancies, for any given unemployment level, there are fewer job-matches, see equations (4.) and (5.). Hence, outflow (O^{ue}) will decrease and consequently unemployment will increase. In steady state the rate of job-destruction, job-creation and the effectiveness of the matching process determine the relationship between unemployment and vacancies; the u-v relationship or *Beveridge curve*. The points on the *Beveridge curve* reflect combinations of unemployment and vacancies, where unemployment is not changing. We put emphasis upon the facts that the *Beveridge curve* is only a steady state locus and that this equilibrium relationship entails a inverse connection between unemployment and vacancies.

In practice, the steady-state of an economy is continually undermined by reappearing shocks. With respect to our analysis, several types of shocks are of analytical importance. Aggregate demand shocks, shocks reflecting structural shifts and labour supply shocks. The impact of each of these shocks on the *Beveridge*

curve is quite different. A decrease in aggregate demand leads to an increase in unemployment and a fall in the number of vacancies, *i.e.* unemployment and the number of vacancies are steered in opposite directions, at a given structural labour market situation. After the initial impact of the adverse aggregate demand shock, the increase of the unemployment-vacancy ratio will slow down and, due to the bigger unemployment stock, matching will increase. The velocity with which unemployment increases will diminish. In the 'new' steady state the labour market will reach an equilibrium, given the vacancy level, at a higher unemployment level than before.

It can be shown⁴ that fluctuations in aggregate demand (temporary shocks) lead to counterclockwise movements around the *Beveridge curve*. At points to the right of the *Beveridge curve* vacancies are above equilibrium, given the unemployment level. Consequently, $O^{ue} > I^{eu}$. Hence, unemployment is falling. At points to the left of the *Beveridge curve* vacancies are below equilibrium, given the unemployment level. Therefore, $O^{ue} < I^{eu}$. Thus, unemployment is rising. The aggregate demand shock does not actually shift the *Beveridge curve*, whereas a structural shift (a permanent shock), at a given level of aggregate demand, can lead to an increase, or decrease in both vacancies and unemployment, *i.e.* movements in the same direction. This kind of shock leads to an outward or inward shift of the *Beveridge curve*. Looking at the movements of and around the *Beveridge curve* can tell us what characterizes the situation in the labour market.

There is another feature which can influence the unemployment-vacancies relationship. Movements in labour supply influence the unemployment-vacancies

⁴ See Blanchard and Diamond (1989), pp. 12-14.

relationship through their impact on employment and unemployment. It is quite obvious that an expansion of the labour force leads to a temporary increase in unemployment and a decrease in the number of vacancies. An increase in the labour force could be due to demographic shifts or increased female participation rates, *e.g.* caused by permanent changes in social attitudes (emancipation). The financially motivated added worker effect, *i.e.* female participation inspired by a decline in family income (for instance, caused by an aggregate demand shock) is a short-run phenomenon. The (exogenous) labour supply movements will have their impact on employment, unemployment and the number of vacancies. However, there is no reason to believe that these labour supply shocks have a permanent (long-run) effect on the relationship between unemployment and vacancies. Therefore, they will not induce a shift of the *Beveridge curve*.

In order to proceed with constructing the model, we set up the unemployment-vacancies relationship:

$$U_{t+1} - U_t = I_t - O_t \quad (8.a.)$$

$$= I_t^{lu} + I_t^{eu} - (O_t^{ul} + O_t^{ue})$$

$$= I_t^{lu} - O_t^{ul} + k_t E_t - O_t^{ue}$$

$$= l_t E_t + k_t E_t - O_t^{ue} \quad (8.b.)$$

We have assumed that $l_t = (I_t^{lu} - O_t^{ul})/E_t$, which is a measure of the net inflow into the unemployment stock from out of the labour force.

In steady-state, the unemployment level does not change. Consequently, the inflow into unemployment equals the outflow out of the unemployment stock.

Hence:

$$U_{t+1} = U_t, \quad I_t = O_t, \quad I_t^{lu} + I_t^{eu} = O_t^{ue} + O_t^{ul} \quad (9.)$$

Combining equations (8.b.) and (9.) leads to:

$$(l_t + k_t)E_t - O_t^{ue} = 0 \quad (10.)$$

Equations (6.b.) and (10.) imply that in steady state the following relation will hold (further on, we drop the subscripts regarding the periods (t)):

$$(1 + k)E = cU(V/(cU + \check{c}(cU/V)^{-\beta} E))^{1-\alpha} \quad (11.)$$

The unemployment rate is defined as $u = U/(U+E)$, whereas the vacancy rate is defined as $v = V/E$. In addition we can define:

$$u/(1-u) = U/(U+E)/\{(U+E)/(U+E) - U/(U+E)\} = U/E = \bar{u} \quad (12.)$$

Combining equations (11.) and (12.) leads to the *Beveridge curve*:

$$(1 + k) = \bar{c}\bar{u}(v/(\bar{c}\bar{u} + \check{c}(\bar{c}\bar{u}/v)^{-\beta}))^{1-\alpha} \quad (13.)$$

Taking total derivatives leads to⁵ :

⁵ See the appendix to this chapter.

$$dl + dk = \alpha_1 d(\log \bar{u}) + \alpha_1 d(\log c) + \alpha_2 d(\log v) \quad (14.)$$

With α_1 and α_2 defined as:

$$\begin{aligned} \alpha_1 &= \{c\bar{u}(v/(c\bar{u} + \check{c}(c\bar{u}/v)^{-\beta}))^{1-\alpha}\} * \\ &\{1 + [(\alpha-1)(c\bar{u} - \beta\check{c}(c\bar{u}/v)^{-\beta})/(c\bar{u} + \check{c}(c\bar{u}/v)^{-\beta})]\} , \alpha_1 > 0, \\ \alpha_2 &= \{c\bar{u}(v/(c\bar{u} + \check{c}(c\bar{u}/v)^{-\beta}))^{1-\alpha(1-\alpha)}\} * \\ &\{1 - [\beta\check{c}(c\bar{u}/v)^{-\beta})/(c\bar{u} + \check{c}(c\bar{u}/v)^{-\beta})]\} , \alpha_2 > 0 \end{aligned}$$

In order to ensure that the *Beveridge curve* is downward sloping, it is necessary that α_2 is positive. By definition, $0 \leq \alpha < 1$, see equation (5.). Hence, α does not cause any problems regarding the sign on α_2 . If $\beta > 0$, then α_2 is positive as long as:

$$\begin{aligned} \beta\check{c}(c\bar{u}/v)^{-\beta} &< (c\bar{u} + \check{c}(c\bar{u}/v)^{-\beta}) \Rightarrow \\ \beta\check{c}(c\bar{u}/v)^{-\beta} - (\check{c}(c\bar{u}/v)^{-\beta}) &< c\bar{u} \Rightarrow \\ (\beta-1)\check{c}(c\bar{u}/v)^{-\beta} &< c\bar{u} \end{aligned}$$

We have made the assumption that $\beta < 1$, see equation (2.). This is a sufficient condition for α_1 and α_2 to be positive.

In order to look at the possible causes of a shift in the *Beveridge curve*, we rearrange equation (14.). Consequently:

$$d(\log \bar{u}) = -(\alpha_2/\alpha_1)d(\log v) - d(\log c) + (1/\alpha_1)(dl + dk) \quad (15.)$$

According to this, the possible causes for an outward shift of the *Beveridge curve* are: first, the net inflow from out of the labour force rises; $l \uparrow$, second, an increase in the outflow rate into unemployment, the turnover rate; $k \uparrow$ and finally, the search effectiveness of the (unemployed) job-searchers decreases; $c \downarrow$. Therefore, it is of crucial importance to determine which economic features affect the possible causes of shifts in the *Beveridge curve*. These economic features will be the topic of debate in the last two sections of this chapter.

2.3. The Importance of a Shift of the *Beveridge Curve*.

As has been pointed out above, the position and the movements of and around the *Beveridge curve* can illustrate what characterizes the situation in the labour market. Also, as we will now focus upon, the importance of the *Beveridge curve* lies in its relationship to wage determination.

Given a competitive market system (market clearing) without price inertia, wages are determined in a competitive way and it is supposed that in equilibrium the suppliers of labour will all be on their labour supply curves. Hence, unemployment will not be considered as a very important economic indicator. Unemployment under this kind of regime, will be due to productivity and labour supply shocks. Consequently, unemployment will be considered as a short run phenomenon and the *Beveridge curve* will not be regarded as important in economic analysis. As will be documented in the following chapter, unemployment in the eighties is much higher than in previous decades. Also, there is the appearance of substantial numbers of long-term unemployed, which will be discussed in the next section. However, the high unemployment figures do not automatically imply a higher equilibrium rate of unemployment or a more outward position of the *Beveridge curve*.

Given the existence and persistence of high unemployment, which could reflect disequilibrium in the labour market, it is not surprising that theories containing elements of non-competitive wage determination have appeared. Some of

these (bargaining) models contain mechanisms whereby unemployment, as an opportunity cost for the worker, directly affects the model outcome. Below, we will briefly discuss some of these models, *e.g.* efficiency wage models and union bargaining models, which can explain the persistence of unemployment even in the long-run.

The main characteristic of efficiency wage models is that firms pay wages higher than the competitive equilibrium wage level⁶. In other words, firms may find it disadvantageous to cut wages even in the presence of unemployment. There could be several reasons why firms may behave in this way. The shirking model is based on one of these reasons⁷. The firms pay more in order to stimulate work effort, because the cost of monitoring, to check whether the worker is shirking or not, is high. Hence, additional pay is required to take away the incentive to shirk. It pays the worker to put more effort in because, due to the higher wages there is unemployment. The penalty for shirking is job-loss without immediate prospects of another job. There is the sociological/moral/fairness approach, which focuses on the 'gift-exchange' nature of employment arrangements⁸. According to this, firms pay higher wages in order to induce their employees to identify themselves with the firm. In this manner, higher wages improve morale and increase productivity. Pay is just one of the stimuli, fringe benefits another. Another reason for paying more is to avoid the high costs associated with labour turnover. Hiring and firing costs are high, especially for skilled labourers. Alternatively, firms, especially large ones,

⁶ For a clear discussion on this topic, see Nickell (1990).

⁷ See Shapiro and Stiglitz (1984).

⁸ See Akerlof (1982).

could pay their workers higher wages in order to avoid productivity disruptions. These could, of course, be caused by unions. Also, paying relatively high wages gives the firm the opportunity to attract high quality job-applicants, which enables the firm to select high quality workers. So there are many reasons for firms to pay more than the competitively determined equilibrium wage. However, it should be quite clear that the existence of a large unemployment pool will enable firms to curb the wage level.

When firms and unions are not only bargaining over the wage level but over the employment level as well, it can be shown that efficiency wage models⁹ can lead to an efficient contract. That is, efficient to the contract partners, not necessarily to the rest of the world. Note, in most cases unions bargain over wages and working conditions, whereas employers determine employment ('right to manage')¹⁰.

It is assumed that firms will try to maximise their profits. The union can strive for various goals¹¹, e.g. wage bill maximization. It is not impossible that the goals of the union membership and the union leadership may differ. Anyway, most popular in the context of union bargaining models is the concept of an 'utilitarian' union striving for utility maximization. The union is trying to maximise the utility of its members, which is a function of wages and unemployment, where the workers are comparing the utility of an union job with a nonunion job. The best known model regarding these bargaining problems is the 'Nash' model. In this

⁹ See, among others, Hall and Lilien (1979) and McDonald and Solow (1981).

¹⁰ See Nickell (1990), p. 413.

¹¹ For a lengthy discussion of union behaviour, see Farber (1986).

context, both bargaining partners will maximise their profit or utility relative to the outcome in case an agreement is not reached: strike, disruption of production. The outcome of the bargaining process depends on (among other factors) the bargaining power of the parties involved, the existence of asymmetric information, *i.e.* one party having information the other party does not possess, the weight unemployment has in the union's utility function and the possible influence of non-union workers (outsiders). A consequence of this way of wage determination, as has been shown¹², is a situation wherein the wage is a mark-up on outside wages and, among other things, is decreasing in the unemployment rate. In these models unemployment affects downward pressure on the wages. However, at the same time firms and unions, or insiders for that matter, do have reason to create and maintain a situation wherein higher than competitively determined equilibrium wages are being paid to at least some workers. Thereby, explaining the persistence of unemployment.

As stated above, wages depend positively on the ease with which an unemployed job-searcher of given search effectiveness can obtain work (O^{ue}/cU). Also, the difficulty of filling vacancies as measured by the duration of vacancies (V/M), has a positive impact on wages. However, the duration of vacancies and the ease with which an unemployed job-searcher finds a job are directly related. Recall equation (5.):

$$M = (cU + \check{c}(cU/V)^{-\beta}E)^{\alpha}(V)^{1-\alpha} \quad (5.)$$

¹² See Nickell (1990), p. 415, and Nickell and Wadhvani (1990).

This leads to the following measure of the duration of vacancies:

$$\begin{aligned} M/V &= (cU + \check{c}(cU/V)^{-\beta}E)^{\alpha}/V^{\alpha} \Rightarrow \\ V/M &= (V/(cU + \check{c}(cU/V)^{-\beta}E))^{\alpha} \end{aligned} \quad (16.a.)$$

Recall equation (6.b.):

$$O^{ue}/cU = M/(cU + \check{c}J) = (V/(cU + \check{c}(cU/V)^{-\beta}E))^{1-\alpha} \quad (6.b.)$$

Combining equations (6.b.) and (16.a.) leads to:

$$(O^{ue}/cU)^{\alpha/(1-\alpha)} = V/M = (V/(cU + \check{c}(cU/V)^{-\beta}E))^{\alpha} \quad (16.b.)$$

Hence, the difficulty of filling vacancies is directly related to the ease with which an unemployed job-searcher finds a job, so we need only to consider the latter. Accordingly, wages depend positively on (O^{ue}/cU) . Recalling and rearranging the steady state relationship, equation (10.):

$$O^{ue}/E = k + l \quad (17.)$$

Consequently, wages depend positively on $((k+l)/c\bar{u})$. Therefore, pressure on wages at any given unemployment level is increasing in the turnover rate (k) and the net inflow from out of the labour force (l), whereas it is decreasing in search effectiveness of the unemployed job-searcher (c). However, as we have seen in equation

(15.), these variables are also responsible for possible shifts in the *Beveridge curve*. Thus, an outward shift of the *Beveridge curve* corresponds exactly to an increase in inflationary pressure at a given unemployment level. This corresponds, in its turn, to a rise in the equilibrium level of unemployment, which is precisely why we are interested in outward shifts of the *Beveridge curve*.

2.4. The Beveridge Curve and Long-term Unemployment.

2.4.1 Long-term Unemployment Effects.

As far as the long-term unemployed are concerned, it is assumed that personal characteristics influence their chances of re-entry in the employment stock. With respect to this, two conflicting hypotheses are in fashion: the state dependency (duration dependence) and the unobserved heterogeneity hypotheses. The key element in both hypotheses is the substantial decline in the outflow rate, or exit probability, out of unemployment. It has been shown, that for Great-Britain¹³ and Finland¹⁴ (among other countries) the probability of leaving the unemployment stock decreases with the duration of unemployment. In other words: the probability of finding a job is lower for the long-term unemployed than for the short-term unemployed. Regarding the relatively low probability for the long-term unemployed of finding a job, there is evidence¹⁵ that this is due to a decline in search effectiveness with duration rather than a decline in search effort (time spend on job-search).

A description of the two conflicting hypotheses is appropriate. First, the pure state-dependence (duration) hypothesis: each individual becoming unemployed

¹³ See Budd, Levine and Smith (1988), pp. 1075-1079.

¹⁴ See Aarnio (1989), pp. 69-71.

¹⁵ See Layard, Nickell and Jackman (1991), pp. 263-265.

has initially the same probability of becoming reemployed. Unemployment experience itself affects the exit probability. Hence, the individual exit probability becomes a function of duration. In the case of negative state dependence, the longer a person is unemployed, the smaller his/her probability of becoming reemployed. There could be several reasons for the decline in exit probability. Long-term unemployed persons become demoralized by lack of success. Hence, their search activity declines with unemployment duration. Also, the long-term unemployment experience may be seen by employers as a bad indicator of the workers' productivity (lack of recent work-experience, loss of skills): stigmatization or discrimination.

Second, the pure heterogeneity hypothesis: people entering unemployment have different individual exit probabilities, which remain fixed throughout the unemployment spell. These differences may be due to personal characteristics; motivation, (innate) ability, etc. Therefore, some individuals have initially fewer chances of finding a job than others. The job-searchers with higher individual exit probabilities leave the unemployment stock relatively fast, the 'good' people leave first! Whereas, those with lower individual exit probabilities remain (longer) in the unemployment stock. Consequently, the proportion of unemployed persons with low individual exit probabilities increases with duration. Hence, we observe a declining average overall exit (hazard) rate. The problem here is to find out what causes the observed decrease of average exit probabilities, negative state dependency or unobserved heterogeneity, or both. There have been several attempts by various authors to cast light on this identification problem. The problem with using cross-sectional data in this respect is the proper estimation of the true hazard. If this is not done properly (due to misspecification and/or the identification problem as

regards state dependency and unobserved heterogeneity) the cross-section approach is not likely to be very fruitful¹⁶. Below, we will follow the approach used by Budd, Levine and Smith¹⁷, making use of time-series data.

This approach uses so-called cohort analysis. We set out the following definitions. Let $U_t^{(T,T+1)}$ be the stock of unemployed at the beginning of period t , who have been unemployed for between T and $T+1$ periods. This group is known as the 'cohort $T,T+1$ '. Also, let $X_t^{(T,T+1)}$ be defined as the exit probability of leaving the unemployment stock, during period t , for those who are unemployed between T and $T+1$ periods. Thus, we have equation (18.):

$$X_t^{(T,T+1)} = [U_t^{(T,T+1)} - U_{t+1}^{(T+1,T+2)}] / U_t^{(T,T+1)} \quad (18.)$$

This is the exit rate in terms of unemployment stocks. We can define the outflow from the unemployment stock for the 'cohort $T,T+1$ ', in an analogous way: $O_t^{(T,T+1)} = U_t^{(T,T+1)} - U_{t+1}^{(T+1,T+2)}$. Hence, the total flow out of the unemployment stock per period is the sum of the various cohort outflows added to the outflow of new entries ($I_t - U_{t+1}^{(0,1)}$).

As stated before, the exit probability is the key element. As has been proven¹⁸, a higher proportional decline in exit probabilities for the long-term unemployed is inconsistent with the assumption of no state dependency. Ergo, when

¹⁶ See Amemiya (1986), pp. 442-447, Heckman (1991), Heckman and Singer (1982) and (1985), Lancaster and Nickell (1980) and Ridder (1987).

¹⁷ See Budd, Levine and Smith (1985) and (1988).

¹⁸ See Budd, Levine and Smith (1988), appendix II, pp. 1089-1090.

the differences in exit probabilities are due to negative state dependency, the increase of the long-term unemployment ratio will induce an outward shift of the *Beveridge curve*. Positive state dependency implies that the long-term unemployed have a better chance of a job than the short-term unemployed, which is clearly not the case. In case of pure heterogeneity the fluctuations in the long-term unemployment ratio will not affect the *Beveridge curve*.

The above may need some further elaboration. In the context of the above, long-term unemployment is important when there is genuine duration dependence in unemployment spells. The detection of duration dependence using micro-data is tricky, but not impossible. Essentially, it is necessary to estimate a hazard function allowing for omitted heterogeneity with a sufficiently flexible baseline hazard. At minimum, omitted heterogeneity should be captured non-parametrically, using mass point techniques¹⁹. Also, the baseline hazard should be flexible enough to allow for non-monotonicity. There are several published British studies which fulfil these criteria²⁰. The results in all these studies indicate that the baseline hazard exhibits negative duration dependence after a certain point, somewhere up to 5 months duration. Interestingly enough, this negative duration dependence is not confirmed in studies for the United States of America²¹, probably because benefits in the USA are of fixed duration. As a consequence the hazard increases towards the benefit exhaustion point. This is not

¹⁹ See Heckman and Singer (1984). Also, the papers referred to in footnote 16.

²⁰ For an early example, see Nickell (1979). More recently (and possibly more sophisticated), Narendranathan and Stewart (1989) and (1991).

²¹ For instance, see Heckman and Borjas (1980) and Meyer (1990).

relevant for the United Kingdom, or the Netherlands for that matter, where benefits are effectively indefinite. The Swedish situation is more complicated. A benefit can run out, but employment guarantees exist (we refer to chapter 4.). However, long-term unemployment is not a typical Swedish problem.

Nevertheless, because studies based on micro-data (cross section) find it so hard to identify the true baseline hazard, alternative aggregate (time series) tests of negative duration dependence have been devised²².

It is argued that, in a comparison of steady states, the overall exit rate from unemployment and the exit rate from unemployment for new entrants move in proportion if there is pure heterogeneity and no state dependence. However, as Jackman and Layard note:

"...But in Britain over the last twenty years the aggregate exit rate has fallen by very much more than the fall in the exit rate of new entrants. This appears inconsistent with an explanation based on pure heterogeneity and suggests that state-dependence must be present..."²³

Furthermore, tests are performed on the significance of an indicator of search effectiveness (often denoted by \hat{c} or a character similar to it) and the survival rate (often denoted by S_d). When the indicator of search effectiveness is significant when it comes to explaining the aggregate outflow rate this serves as evidence for duration dependence. When the survival rate is significant w.r.t.

²² Apart from the time series studies already mentioned above by Aarnio (1989) and Budd, Levine and Smith (1985) and (1988), we also refer to Jackman and Layard (1991) and Layard, Nickell and Jackman (1991), pp. 259-265.

²³ See Jackman and Layard (1991), p. 94.

duration specific outflow rates this indicates the presence of heterogeneity. As regards the empirical evidence it is stated:

"...Thus, however we view the evidence, it supports the existence of some state-dependence. Moreover, turning to the effects of the survival rate (S), these are unreliable, and almost insignificant at both short and long durations..."²⁴

Therefore, it seems fair to state that there is sufficient empirical evidence that duration dependency has played a role, although we do not deny the existence of a heterogeneity effect as regards the overall fall in exit rates from unemployment²⁵.

While looking at several European labour markets, see chapter 3., section 4., we can hardly say that the value of the long-term unemployment ratio has been stable over time. Additionally, the long-term unemployment ratio is very high for the actual unemployment level, compared with its value in the past at comparable unemployment levels. As has been pointed out, employers may discriminate against the long-term unemployed²⁶ who, in their turn, may have a lower than average search intensity. The rise in the long-term unemployment ratio causes, in the case of state dependence, the fall in the exit probabilities. A combination of the more time consuming matching process for the long-term unemployed and the rise in the

²⁴ See Jackman and Layard (1991), p. 100.

²⁵ For the empirical (econometric) evidence see, Jackman and Layard (1991), p. 100 and p. 102. Comparable results (*i.e.* robust significance for the indicator of average search effectiveness of the unemployed, and a, with exceptions, less than significant role for the survival rate), can also be found in Disney et al. (1992), pp. 239-242.

²⁶ See Meager and Metcalf (1987).

long-term unemployment ratio implies that, for a given unemployment level, vacancies remain unfilled for a longer period of time. Hence, the unemployment-vacancies ratio will increase; the *Beveridge curve* will shift out.

In a situation described as state dependence, the rise in long-term unemployment induces average search intensity and suitability to fall, which will ceteris paribus, cause an outward shift of the *Beveridge curve*. This effect could be dampened, or even reversed due to the presence of older workers in the long-term unemployment stock. Older workers are relatively over represented among the long-term unemployed. This could lead to an increase in O_t^{ul} , which denotes the flow from the unemployment stock to out of the labour force; retirement. This effect could be aggravated by the existence of early retirement schemes in several Western European countries, e.g. regarding the Netherlands, the 'Vervroegde Uittreding' (VUT). This (early) retirement effect will shift the *Beveridge curve* inwards.

All in all, when there is state dependency in unemployment, and there is sufficient proof for at least some state dependency in Britain, consistent with the fall of exit probabilities over time for a 'cohort T,T+1', leading to a rise in long-term unemployment which in its turn causes the suitability rate and average search intensity of the unemployed to fall, the *Beveridge curve* will shift outwards.

2.4.2. The Basic Model Extended.

In this section the characteristics of the long-term unemployed will be

embodied in the basic model outlined in section (2.2.). The key element here is the search effectiveness of the unemployed, which not only depends on long-term unemployment, but on several other factors as well.

It is important to state that the effectiveness of the unemployed job-searcher (c), depends positively on the search intensity of the unemployed (su_t) and the choosiness of employers (sf_t). Therefore, the 'general' *Beveridge curve* can be written as:

$$\log u_t = f_1(\log v_t, l_t, k_t, su_t, sf_t) \quad (19.)$$

However, the search intensity of the unemployed depends on unemployment benefits, benefit level (b_t) and benefit duration (bd_t), the long-term unemployment experience itself (ltu_t) and other variables (xsu_t). Choosiness of employers (sf_t) depends on mismatch (mm_t), the long-term unemployment experience (ltu_t) and other variables (xsf_t). Therefore:

$$su_t = g_1(b_t, bd_t, ltu_t, xsu_t) \quad (20.)$$

$$sf_t = g_2(mm_t, ltu_t, xsf_t) \quad (21.)$$

A description of these variables, other than long-term unemployment, is appropriate. First, let us look more closely at the feature which can be described as mismatch (mm_t). As has been stated above, the process of matching potential employees with firms is time-consuming, and thus costly. Several factors influence this. Matching might not take place instantly due to regional and/or occupational

differences between vacancies and job-searchers. Also, requirements w.r.t. skills are possibly not instantly met by potential employees. This feature is otherwise known as mismatch.

The mismatch index as developed by Jackman, Layard and Pissarides²⁷ is one of the indicators of structural unemployment. This indicator can be constructed for instance w.r.t. occupation and can be, as far as it concerns its impact on the *Beveridge curve*, investigated empirically in a straightforward manner. One possible mismatch index may be defined as follows:

$$1/2 * \{ \sum_i | [(U_i/U_{tot}) - (V_i/V_{tot})] | \} \quad (22.)$$

Unemployment per category, *e.g.* occupation, region is denoted by U_i ; U_{tot} reflects total registered unemployment; V_i denotes vacancies per category and V_{tot} represents the total number of registered vacancies. Thus, structural mismatch (persistent rather than temporary mismatch) with its negative impact on the effectiveness on the matching process, increasing the amount of structural unemployment, can induce an outward shift of the *Beveridge curve*.

The other variables (x_{su_t} and x_{sf_t}) which influence the search effectiveness of the unemployed job-searcher will include the effect of labour market policies. Labour market policies are aimed at bringing down the unemployment level. In the context of the matching function, this means that the apparent loss of efficiency (the high level of aggregate unemployment) of the labour market could

²⁷ See Jackman, Layard and Pissarides (1984), pp. 8-9. For a lengthy discussion of mismatch and various mismatch indices, see Jackman, Layard and Savouri (1991), and Layard, Nickell and Jackman (1991), pp. 285-335.

be restored by the labour market policies: improving search effectiveness, we refer to equations (4.) and (5.). So, policies could be aimed at increasing the effectiveness of the employment service: making it easier for employees and employers to find a proper match. Alternatively, the increase in training programs could to take away the difference between supply and demand of skills. Also, some labour market policies, the implementation of job creation programs, *e.g.* public works etc, financed out of general funds, and employment subsidies, *e.g.* subsidies for employers who hire long-term unemployed workers are intended to stimulate demand for (certain categories of) labour. It has been shown that the influence of these policies (the implementation of labour market policies was intensified in the eighties) reduces unemployment²⁸. Also, the labour market policies had their effect on structural mismatch, with an inward moving impact on the *Beveridge curve*.

Another one of the 'other variables' may be the cost of the search process. The more costly the search process the lower will be the search intensity. If successful search looks so impossible to the worker that he\she gives up search altogether, we speak of the discouraged worker effect. The choosiness or search intensity of the employer can be affected in an analogous way. Consequently, the lower the availability of workers and the higher the costs (the lower the profitability of a job), the more chance there is of a decline in search intensity on behalf of the employers. Also, if it becomes more difficult to dismiss workers, *e.g.* due to more rigid employment protection laws, the choosiness of employers will increase (their search intensity will fall).

²⁸ See Jackman, Pissarides and Savouri (1990a) and (1990b).

The unemployment benefit level (b_t) and duration (bd_t) effects upon the search effectiveness and search intensity of the unemployed is worth a more detailed view. The replacement ratio is the ratio of the value of unemployment benefits to the (expected) wage rate. If this ratio goes up, the difference between wage and benefit declines. Consequently, the search intensity of the potential employee will fall. If the job-availability is low, search can be expected to be difficult. Hence, the search intensity will fall. A job-searcher will accept a job-offer if the offered wage exceeds his\her reservation wage. The reservation wage is increasing in benefits, *i.e.* when the benefit level increases the reservation wage will rise. On the other hand, benefits are expected to decline with duration. So, the longer the length of a persons' unemployment spell the lower the reservation wage of that person.

So, one has to look at the significance of employment legislation changes or changes in benefit system; replacement ratio, etc. Unemployment benefits seem to have a small impact on unemployment and especially on the conditional probability of leaving unemployment for the long-term unemployed²⁹. The suitability rate and average search intensity are unobservable variables and the long-term unemployment ratio might be used as a proxy for these unobservables.

There is one problem regarding the analysis so far. The equations (20.) and (21.) tell us which variables influence the search effectiveness of the unemployed job-searcher. The main point to be made is that long-term unemployment is not exogenous to these variables. Long-term unemployment depends upon unem-

²⁹ With regard to: the Netherlands, see Ridder and Gorter (1986) and van den Berg (1990); and the United Kingdom, see Narendranathan, Nickell and Stern (1985) and Pissarides (1986).

ployment as well as benefit duration, benefit level, mismatch and other variables.

Therefore:

$$ltu_t = g_3(u_t, bd_t, b_t, mm_t, xltu_t) \quad (23.)$$

Regarding *Beveridge curve* analysis we have to take the 'non-exogeneity' of long-term unemployment into account. Combining equations (19.), (20.), (21.) and (23.) leads to:

$$\log u_t = f_2(\log v_t, l_t, k_t, ltu_t, b_t, bd_t, mm_t, xsu_t, xsf_t) \quad (24.a.)$$

and

$$ltu_t = g_3(u_t, bd_t, b_t, mm_t, xltu_t) \quad (24.b.)$$

Thus, we need two equations to analyse the *Beveridge curve*. As far as it concerns the feature of long-term unemployment, the above equations (24.a.) and (24.b.) constitute the basic model which enables us to analyse *Beveridge curve* movements.

As will be shown elsewhere, the long-term unemployment ratio proves to be of significant importance when it comes to estimating the *Beveridge curve* in Great-Britain and the Netherlands.

2.5. The Beveridge Curve and Hidden Unemployment.

Most first world economies can be characterized by, among other things, the existence of a more or less comprehensive social security system. These institutional arrangements can have an impact on the *Beveridge curve*. As we have seen in the previous section, institutional arrangements can reflect the impact of the social security system, through the unemployment benefit level and the replacement ratio on the unemployment pattern, we refer to equations (20.) and (21.). Apart from the possible impact of employment legislation, and the real value of benefits relative to the real wage rate etc., on the unemployment pattern, these institutional arrangements could influence the unemployment figures in yet another way. Key elements here are the inappropriate use of social security regulations and the feature of hidden unemployment. In order to clarify this point with an example, we give a brief description of the practice regarding the Dutch labour unsuitability acts.

In most first world countries, it has been decided on the basis of sound political motives, that those who are not in a position to work should be entitled to a income-compensating benefit in order to have adequate financial support³⁰. One of the schemes based on the foundations of the welfare state is the provision of a benefit in case of physical disability. Application of this physical disability criterion

³⁰ In the Netherlands for instance, the obligation of the government to guarantee financial support to Dutch citizens, who themselves are not able to earn the social minimum income level, is laid down in the Dutch constitution. See, Grondwet voor het Koninkrijk der Nederlanden, Hoofdstuk 1, art. 20.

varies from country to country. In the Netherlands³¹ the 'Algemene Arbeidsongeschiktheidswet en de Wet Arbeidsongeschiktheid' (AAW\WAO), the labour unsuitability acts, provide the legal basis for payments to the physically disabled. The point is that until very recently, the act stated that in assessing the applicants' medical situation his\her chances of obtaining a job should be taken into account. Therefore, it is not unlikely that quite a few of those actually enlisted on the scheme on basis of pure medical reasons should not be regarded as disabled but as unemployed. With that knowledge in mind, we should at least attempt to correct for the unemployment figures as used in the matching function and the *Beveridge curve*. Note, it is a fact that a small group of people enlisted on the AAW\WAO scheme return to work and are thus participating in the matching process. Yet another feature should be noted. Applicants to the AAW\WAO scheme who were previously in private sector employment cannot enlist without having been enlisted first in the 'Ziektewet' (ZW), sickness benefit provision. The duration of this enlistment is, at most, one year. Therefore, those enlisted on the AAW\WAO-scheme who can be regarded as unemployed, can be accounted for as long-term unemployed. One year is the threshold for the most commonly used long-term unemployment definition. As has been discussed in the previous section, this characterization enforces us to take account of the lower search intensity and search effectiveness of what we will call 'unmeasured unemployed' persons, and a less than average willingness of employers to employ these people. It is important to account for these effects when estimating the 'true' *Beveridge curve*.

³¹ A more detailed description of the developments regarding the Dutch labour unsuitability acts can be found in chapter 4, section 2.

As will be described in chapter 4., the number enlisted in the AAW\WAO scheme has increased substantially since the WAO was introduced in 1967. The actual number of enlisted persons is about 900.000, with a total population of about 15 million persons in the Netherlands. There is no reason to believe that the Dutch general state of health has declined significantly over the last two decades. This is one of the main reasons why the amount of 'true' disability among those enlisted on the AAW\WAO scheme is the subject of public debate³². As will be pointed out later, in practice the Dutch labour unsuitability acts turned out to be a financial resort for quite a few people who would otherwise have been regarded as (long-term) unemployed. Given that, it is worth looking at how this fact could affect estimation of the *Beveridge curve*.

Accepting that the Dutch 'unsuitable for labour' stock (WBW) contains 'unmeasured unemployed' (UU) persons, over the last fifteen years the existence of the AAW\WAO scheme has had a decreasing impact on the amount of aggregate unemployment and on the unemployment rate in the Netherlands.

Let us recall the matching function:

$$M = m(cU, \check{J}, V) \quad (4.)$$

A lower level of unemployment theoretically leads to less matching. For reasons stated above, the 'unmeasured unemployed' will have a very low search intensity and search effectiveness. Therefore, if the 'unmeasured unemployed' had

³² For instance, see de Kam and Nypels (1990), Trouw (1990a), p. 4 and (1990b), p. 1. Also, see the references as regards section 4.2.

been included in the unemployment stock the average search effectiveness of the unemployed (c) would be lower as it is now, with its decreasing impact on matching.

It is conceivable that the unexpected developments regarding the AAW\WAO scheme has led to a huge flow from employment into the AAW\WAO stock; L_t^{ew} , thereby decreasing the flow from employment into unemployment; L_t^{eu} , and the turnover rate (k_t), see equation (19.). As stated before, the amount of 'unmeasured unemployed' in the AAW\WAO stock, depends upon the unemployment benefit level (b_t), unemployment benefit duration (bd_t) and possible other variables (xUU_t), e.g. the social status of not being unemployed. Therefore:

$$UU_t = q * WBW_t \quad (25.)$$

$$UU_t = g_4(b_t, bd_t, xUU_t) \quad (26.)$$

Where, q denotes that a share of the unsuitable for labour stock can be regarded as 'unmeasured unemployed'. Combining equations (25.) and (26.) with equations (24.a.) and (24.b.) leads to the following *Beveridge curve* model:

$$\log u_t = f_3(\log v_t, l_t, k_t, ltu_t, b_t, bd_t, mm_t, xsu_t, xsf_t, xUU_t) \quad (27.a.)$$

and

$$ltu_t = g_3(u_t, bd_t, b_t, mm_t, xltu_t) \quad (27.b.)$$

Given that the unemployment rate depends positively upon the turnover rate, it is clear that a fall in the turnover rate due to an increase of the flow into the

'unmeasured unemployed' stock, will have a negative impact on the unemployment figures. Following this approach, the coefficient on the stock of 'unmeasured unemployed' in the *Beveridge curve* specification would have a negative sign, denoting an inward moving impact.

As will be shown elsewhere, the stock of 'unmeasured unemployed' prove to have a significant impact on the Dutch *Beveridge curve*.

Appendix to chapter 2.

The *Beveridge curve* can be modelled as:

$$(1 + k) = \bar{c}\bar{u}(v/(\bar{c}\bar{u} + \check{c}(\bar{c}\bar{u}/v)^{-\beta}))^{1-\alpha} \quad (13.)$$

Rewriting leads to:

$$(1 + k) = \bar{c}\bar{u}(v)^{1-\alpha}(\bar{c}\bar{u} + \check{c}(\bar{c}\bar{u})^{-\beta}(v)^{\beta})^{\alpha-1} \quad (13.b.)$$

Taking the total derivative w.r.t. c (dc) leads to:

$$\begin{aligned} & \bar{u}(v)^{1-\alpha}(\bar{c}\bar{u} + \check{c}(\bar{c}\bar{u})^{-\beta}(v)^{\beta})^{\alpha-1} + [(\bar{c}\bar{u}(v)^{1-\alpha}) [(\alpha-1)(\bar{c}\bar{u} + \check{c}(\bar{c}\bar{u})^{-\beta}(v)^{\beta})^{\alpha-2} \\ & \quad * (\bar{u} + -\beta\check{c}(c)^{-\beta-1}(\bar{u})^{-\beta}(v)^{\beta})]] = \\ & \bar{u}(v)^{1-\alpha}(\bar{c}\bar{u} + \check{c}(\bar{c}\bar{u})^{-\beta}(v)^{\beta})^{\alpha-1} + [(\bar{c}\bar{u}(v)^{1-\alpha}) [(\alpha-1)(\bar{c}\bar{u} + \check{c}(\bar{c}\bar{u})^{-\beta}(v)^{\beta})^{\alpha-1} \\ & \quad * (\bar{u} + -\beta\check{c}(c)^{-\beta-1}(\bar{u})^{-\beta}(v)^{\beta})/(\bar{c}\bar{u} + \check{c}(\bar{c}\bar{u})^{-\beta}(v)^{\beta})]] = \end{aligned}$$

Rearranging:

$$\begin{aligned} & (1/c) \{ [\bar{c}\bar{u}(v)^{1-\alpha}(\bar{c}\bar{u} + \check{c}(\bar{c}\bar{u})^{-\beta}(v)^{\beta})^{\alpha-1}] \\ & \quad + ((\bar{c}\bar{u}(v)^{1-\alpha}) [(\alpha-1)(\bar{c}\bar{u} + \check{c}(\bar{c}\bar{u})^{-\beta}(v)^{\beta})^{\alpha-1} \\ & \quad * (\bar{c}\bar{u} + -\beta\check{c}(c)^{-\beta}(\bar{u})^{-\beta}(v)^{\beta})/(\bar{c}\bar{u} + \check{c}(\bar{c}\bar{u})^{-\beta}(v)^{\beta})]) \} = \\ & (1/c) \{ [\bar{c}\bar{u}(v/(\bar{c}\bar{u} + \check{c}(\bar{c}\bar{u}/v)^{-\beta}))^{1-\alpha}] \\ & \quad * [1 + [(\alpha-1)(\bar{c}\bar{u} - \beta\check{c}(\bar{c}\bar{u}/v)^{-\beta})/(\bar{c}\bar{u} + \check{c}(\bar{c}\bar{u}/v)^{-\beta})]] \} \end{aligned}$$

Define α_1 as: $\alpha_1 = \{ [c\bar{u}(v/(c\bar{u} + \check{c}(c\bar{u}/v)^{-\beta}))^{1-\alpha}] * [1 + [(\alpha-1)(c\bar{u} - \beta\check{c}(c\bar{u}/v)^{-\beta})/(c\bar{u} + \check{c}(c\bar{u}/v)^{-\beta})]] \}$

Hence, $d/dc = \alpha_1(1/c) = \alpha_1 d/dc(\log c)$.

Derivation w.r.t. \bar{u} ($d\bar{u}$) leads to a similar result:

$d/d\bar{u} = \alpha_1(1/\bar{u}) = \alpha_1 d/d\bar{u}(\log \bar{u})$.

Recall equation (13.b.):

$$(1 + k) = c\bar{u}(v)^{1-\alpha}(c\bar{u} + \check{c}(c\bar{u})^{-\beta}(v)^\beta)^{\alpha-1} \quad (13.b.)$$

Taking the total derivative w.r.t. v (dv) leads to:

$$\begin{aligned} & c\bar{u}(1-\alpha)(v)^{-\alpha}(c\bar{u} + \check{c}(c\bar{u})^{-\beta}(v)^\beta)^{\alpha-1} \\ & + [(c\bar{u}(v)^{1-\alpha}) [(\alpha-1)(c\bar{u} + \check{c}(c\bar{u})^{-\beta}(v)^\beta)^{\alpha-2} * (\beta\check{c}(c\bar{u})^{-\beta}(v)^{\beta-1})]] = \\ & c\bar{u}(1-\alpha)(v)^{-\alpha}(c\bar{u} + \check{c}(c\bar{u})^{-\beta}(v)^\beta)^{\alpha-1} \\ & + [(c\bar{u}(v)^{1-\alpha}) [(\alpha-1)(c\bar{u} + \check{c}(c\bar{u})^{-\beta}(v)^\beta)^{\alpha-1} * (\beta\check{c}(c\bar{u})^{-\beta}(v)^{\beta-1})/(c\bar{u} + \check{c}(c\bar{u})^{-\beta}(v)^\beta)]] \end{aligned}$$

Rearranging:

$$\begin{aligned} & (1/v) \{ [c\bar{u}(1-\alpha)(v)^{1-\alpha}(c\bar{u} + \check{c}(c\bar{u})^{-\beta}(v)^\beta)^{\alpha-1} + [(c\bar{u}(v)^{1-\alpha}) \\ & * (\alpha-1)((c\bar{u} + \check{c}(c\bar{u})^{-\beta}(v)^\beta)^{\alpha-1})(\beta\check{c}(c\bar{u})^{-\beta}(v)^\beta)/(c\bar{u} + \check{c}(c\bar{u})^{-\beta}(v)^\beta)] \} = \\ & (1/v) \{ [c\bar{u}(v/(c\bar{u} + \check{c}(c\bar{u}/v)^{-\beta}))^{1-\alpha}] \\ & * [(1-\alpha) + (\alpha-1)[(\beta\check{c}(c\bar{u}/v)^{-\beta})/(c\bar{u} + \check{c}(c\bar{u}/v)^{-\beta})]] \} = \end{aligned}$$

$$(1/v) \{ [c\bar{u}(v/(c\bar{u} + \check{c}(c\bar{u}/v)^{-\beta}))^{1-\alpha}(1-\alpha)] * [1 - [\beta\check{c}(c\bar{u}/v)^{-\beta}]/(c\bar{u} + \check{c}(c\bar{u}/v)^{-\beta})] \}$$

Define α_2 as: $\alpha_2 = \{ [c\bar{u}(v/(c\bar{u} + \check{c}(c\bar{u}/v)^{-\beta}))^{1-\alpha}(1-\alpha)]$
 $* [1 - [\beta\check{c}(c\bar{u}/v)^{-\beta}]/(c\bar{u} + \check{c}(c\bar{u}/v)^{-\beta})] \}$

Hence, $d/dv = \alpha_2(1/v) = \alpha_2 d/dv(\log v)$.

Combining the above leads to equation (14.):

$$dl + dk = \alpha_1 d(\log \bar{u}) + \alpha_1 d(\log c) + \alpha_2 d(\log v) \quad (14.)$$

Rearranging equation (14.) leads to:

$$d(\log \bar{u}) = -(\alpha_2/\alpha_1)d(\log v) - d(\log c) + (1/\alpha_1)(dl + dk) \quad (15.)$$

3. Labour Market Developments in Great Britain, the Netherlands and Sweden.

3.0. Introduction.

In the previous chapter we set up a theoretical framework for the analysis of the matching function and the long-run unemployment-vacancies relationship. As we have seen, features like mismatch and long-term unemployment can, in theory, play a crucial role in explaining shifts of the *Beveridge curve*.

We will now turn to the empirical side of matters and describe the developments over the last three decades in the labour markets of Great Britain, the Netherlands and Sweden. The motivation for choosing these three European countries is that, as we shall see, each country exhibits a very different pattern of unemployment and vacancies. This could well be due to, among other things, differences in some particular institutional arrangements in each country.

In order to analyse the *Beveridge curve* we will use time series on, among other variables, total unemployment, aggregate vacancies and total employment for the three countries concerned¹. Unfortunately, changes in definition and/or methods of compilation with regard to these variables occur quite frequently.

Hence, proper time series may not be directly available. Consequently, the raw data

¹ For analysis on the *Beveridge curve* with regard to: the Netherlands, see van den Berg (1982), Graafland (1991) and van Ours (1991); Sweden, see Calmfors (1991); and the United Kingdom, see Pissarides (1986).

must be adjusted where necessary. In section 3.1.1., we will discuss in more detail, some problems regarding the consistency of time series, using the Dutch unemployment series as an example. In section 3.1.2., we will reflect upon some problems typical of data on registered vacancies.

In section 3.2., we will discuss the patterns of unemployment and vacancies in Great Britain, the Netherlands and Sweden. Also, we will look at labour force and total employment patterns. These variables directly affect the patterns of the unemployment and vacancy rates. We will compare the performance of the labour markets in the three countries concerned, and we will comment upon their *Beveridge curves*.

Following this, we will discuss empirical evidence for some variables which may be responsible for shifts of the *Beveridge curve*, in particular, structural imbalances captured by various mismatch indices (see section 3.3.). Additionally, in section 3.4., we will discuss the empirical evidence for long-term unemployment while focusing on the patterns of the long-term unemployment ratios over the last thirty years.

3.1. The Data.

3.1.1. Unemployment Data.

In order to analyse the *Beveridge curve* empirically one must first examine the patterns in the data on unemployment and vacancies. Before discussing these patterns, in section 3.2., we shall look at a related topic, namely the changes in definition of the relevant variables and the method of data gathering as regards these variables.

These changes in definition and/or methods of data collection are particularly troublesome in the context of time series analysis. With time series analysis it is crucial to use a data series on a particular variable which is consistent over time. The story of the Dutch unemployment data in this context is particularly informative.

The data regarding registered unemployment in the Netherlands were supplied by the 'Ministerie van Sociale Zaken en Werkgelegenheid' (SZW), the Dutch employment office (see the notes on table 4.A.). The definition upon which the time series is based is²: the registered unemployed are those who do not have an employment relationship, who are not older than 64 years of age and who are willing and prepared to have an employment relationship for at least twenty hours a week. Also, the unemployed have to be registered with a 'Gewestelijk Arbeids-

² See Ministerie van Sociale Zaken en Werkgelegenheid (1988), p. 100.

bureau' (GAB), a regional labour office³. This official definition has been used by the Dutch employment office since 1983. Unemployment data as supplied by the Dutch employment office for the period 1976-1987 are based on this definition⁴. Changes in the definition of unemployment for this period are embodied in the supplied time series. For the period 1960-1975 original figures were supplied by the Dutch employment office. These are not directly comparable with the figures for 1976-1987. It is worth outlining some changes in the unemployment definition concerning the pre 1976 period. Since July 1970 unemployed married women, whose husbands are working, have been registered as unemployed. Until 1 January 1978 the lower bound, as far as job availability is concerned was 30 hours per week; from 1 January 1978 until 31 December 1982 it was 25 hours per week, and since 1 January 1983 it has been 20 hours per week⁵.

Fortunately, for the period 1976-1978, both the corrected figures (data which conform with the official definition as outlined above) and the original

³ Regarding the United Kingdom the actual unemployment definition is: unemployed persons are those who are claiming benefit at the Unemployment Benefit Offices and who are able and willing to do any suitable work. Note, that unlike the Dutch unemployment definition, there is no mention of a threshold regarding the supply of hours work. See Department of Employment (1991a), p. S67.

⁴ The unemployment definition, according to ILO (International Labour Organisation) guidelines is: unemployed are all persons over a specific age who, during the reference period, were without employment, who were currently available for employment during that period, and who had taken active steps to find employment during a specified recent period. There are no conceptual differences between this unemployment definition and the Swedish one. See OECD (1985), p. 17.

⁵ The exact 'pre 1983' Dutch unemployment definition is: the registered unemployed are those who are not older than 64 years of age and who (a) do not have an employment relationship and are available for work more than 25 hours a week and (b) do have an employment relationship (e.g. volunteers) but not a job and who are available for any job. See, Ministerie van Sociale Zaken en Werkgelegenheid (1988), p. 100.

figures are available. Comparing the corrected and the original figures for these three years, it is possible to compute a correction factor. This correction factor has been used to adjust the original figures for 1960-1975, in order to have a proper time series on unemployment for the period 1960-1987 (series: U_{nl} , table 4.A.). This series does not include data which cover the 'less able' who are employed in 'sociale werkvoorzieningsobjecten', *i.e.* government job schemes for the disabled.

Unfortunately, this is not the end of the story. In particular, the 'Centraal Bureau voor de Statistiek' (CBS), the Netherlands Central Bureau of Statistics, recently claimed that the unemployment data only based upon registration with the regional labour offices were inaccurate⁶. The Dutch central statistics office bases its unemployment figure on registration with the regional labour offices and the 'Enquête Beroepsbevolking', a labour force survey. As can be seen, when we compare these Dutch unemployment figures (see table 1.), the unemployment figures as supplied by SZW, are about one third higher than the figures as obtained by the CBS in a more sophisticated way. The main reasons for the overestimation of the 'true' amount of unemployment are: first, quite a few of those enlisted as unemployed with the labour offices are actually working. Second, a part of the enlisted unemployment stock is not available for work. This is in conflict with the official unemployment definition, and therefore those enlisted with the labour offices should not be regarded as unemployed. A substantial number of those who have found a job apparently do not inform the regional labour offices (or if they do, with considerable delay). The labour office in turn does not record the incoming information about job status and/or work availability in a proper way. Obviously, there

⁶ See Ministerie van Sociale Zaken en Werkgelegenheid (1988), pp. 36-44.

is a registration problem. Consequently, the figure regarding registered unemployment in the Netherlands, as supplied by the Dutch employment office, did not reflect accurately the 'real' amount of unemployment. In any case, the Dutch government, which had pledged to bring down the aggregate unemployment level to around 500 000 persons, decided in 1988 to proclaim the much lower CBS figure (GWL) as the new official figure concerning the registered amount of unemployment (see table 1.).

table 1. Comparison of Dutch Unemployment Figures.

(All figures * 1 000)

Unemployment figure	Year		
	1988	1989	1990
GWL (post '88 (1))	433.0	390.0	346.0
BZB (pre '88 (2))	683.1	660.0	612.0

Notes on table 1.

Ad.(1) Source: Kwartaalbericht Arbeidsmarkt, Ministerie van Sociale Zaken en Werkgelegenheid, Derde Kwartaal (third quarter) 1990 and Vierde Kwartaal (fourth quarter) 1990. This figure represents the official figure regarding the registered unemployed, as computed by the CBS.

Ad.(2) Source: see Ad.(1). This figure concerns those who are registered with the regional labour offices as unemployed.

Given the enormous difference between the unemployment figures as used before 1988 and the official unemployment figure from 1988 onwards, it is obviously impossible to use both figures in a single time series. Furthermore, it is not feasible to correct the unemployment figures for the whole sample period to take

account of the introduction of the new measurement technique. We simply do not have sufficient information on the degree of overestimation, if any, of the 'true' unemployment figure for the period before 1988. Therefore, if we want to apply time series analysis, we have to stick with the 'old' unemployment figure.

Fortunately, the Dutch employment office still publishes the previously official unemployment figure under a new name, *i.e.* 'Bemiddelingsbestand Zonder Baan' (BZB); we are therefore able to extend our data series. It should be noted that the credibility of these BZB figures is in doubt, especially for the years 1988-1990. However, it is our opinion that, in the context of consistent time series, we have no choice but to use these figures.

Changes in the definition and/or methods of compilation as regards economic variables are by no means an uniquely Dutch phenomenon, though the latest change in the officially published Dutch unemployment figure is quite striking. Over the last decade several changes in definition have affected the 'unemployment count' as regards the United Kingdom, we will highlight only a few of these changes⁷.

A significant change in method and definition took place in 1982⁸. At that moment, registration for employment at a Jobcentre or Careers Office ceased to be a condition for entitlement to unemployment benefits⁹. Since the implementa-

⁷ For a more detailed discussion on the measurement of unemployment in Great Britain, see Glynn (1991), pp. 13-32. For a survey of the changes in definition and methods of compilation, and its estimated effects, as regards the British unemployment data, see Morris and Llewellyn (1991), pp. 58-59.

⁸ See Department of Employment (1982), pp. 389-393.

⁹ For a discussion of the comparability of the 'claimant count' figure with British unemployment figures based on the ILO definition, see Department of Employment

tion of this revision the Department of Employment bases its unemployment count on the computerized registration of the benefit offices, whereas it used to base the unemployment figures on records held at the Jobcentres and Careers Offices, where the count was done clerically. Due to this reform non-benefit claimants were excluded, whereas the severely disabled were included in the aggregate unemployment data. The net effect of the exclusion of the non-benefit claimants and the inclusion of the severely disabled unemployed persons was a reduction of the unemployment figure by about eighty thousand persons. The introduction of the computer count increased that effect.

As in the Netherlands (see above) there is a registration problem in the United Kingdom, regarding those who have found employment but at the same time are still enlisted as unemployed with the Unemployment Benefit Office. Estimates of the size of this over-recording problem suggest that the aggregate unemployment figure should be adjusted downwards with about sixty-five thousand persons¹⁰. Relative to the size of the Dutch over-recording problem, the British adjustments are of minor significance.

A recent change as regards the unemployment count entails the new benefit regulations for those who are under eighteen years of age¹¹. About ninety thousand young people are therefore no longer included in the British unemployment figures.

(1988a), pp. 534-547.

¹⁰ See Department of Employment (1986), pp. 107-108.

¹¹ See Department of Employment (1988b), pp. 660-663, and Department of Employment (1991a), p. S16.

Fortunately, the Department of Employment is aware of the problems which the numerous changes in the British definition cause, as far as it concerns the consistency of time series. The Department of Employment has published several historical series on unemployment data¹², containing series which are consistent with the latest definition. We also refer to the notes on table 4.A., Ad.(3).

Data on the unemployment rate are also affected by changes in method of collection or definition as regards employment data. In this respect the Census of Employment and the Labour Force Survey are used to adjust the annual British figures which are derived from the regular sample surveys. These tend to underestimate the number of employees¹³. Again, the Department of Employment has produced historical series on the employment data¹⁴. Also, see the notes on table 5.A., Ad.(6).

In Sweden the most significant break in the series on unemployment and employment took place at the beginning of 1987¹⁵. Prior to 1986, the figures included all persons aged sixteen to seventy four years old. From 1986 onwards the figures exclude those who are aged sixty five to seventy four years. The Swedish Labour Force Surveys conducted by the Statistiska Centralbyrån (SCB), Statistics Sweden, are based upon a sample containing about eighteen thousand persons. Before 1987, the sample size was approximately twenty two thousand persons.

¹² See Department of Employment (1988b), pp. 662-663, and Department of Employment (1989a).

¹³ See Department of Employment (1991b), pp. 197-204.

¹⁴ See Department of Employment (1989b).

¹⁵ See OECD (1990a), p. 391, and p. 473, also, Statistiska Centralbyrån (1990), p. 193.

Also, a new questionnaire was introduced¹⁶. All in all, the new results presented in a new system made direct comparison with figures published before 1987 impossible. As a consequence of the introduction of the new method for estimating unemployment in the Swedish Labour Force Surveys, we have made 'guestimates' as regards the Swedish unemployment figures from 1987 onwards, in order to make these figures comparable with the unemployment figures published before 1987. To sustain our series (see table 4.A.) we had to adjust the new Swedish unemployment figure downwards by about twenty thousand persons.

We have pointed out above, that the introduction of new measurement techniques and changes in definition can create serious problems for time series analysis. Therefore, data adjustment, when feasible, might be necessary. Moreover, the introduction of new measurement techniques may cast doubt on the reliability of the previously published data series. For the sake of consistency of the time series used, it might be imperative to rely on figures gathered in a less sophisticated way.

3.1.2. Vacancy Data.

In section 3.1.1., we have discussed some problems regarding the unemployment data. We will now turn to the data on vacancies.

In the United Kingdom, a registered vacancy is defined as a job opportunity which remained unfilled on the day of count and which had been notified by

¹⁶ See Konjunkturinstitutet (1987), p.68, and Statistiska Centralbyrån (1991), p. 7.

an employer to a Jobcentre or Careers Office. The Department of Employment publishes data on the number of vacancies registered with the Jobcentres, and it is upon this that our vacancy series for Great Britain is based (see table 4.A.). Unfortunately, the figures with regard to vacancies have to be treated cautiously. There are a few shortcomings concerning the data on vacancies and their usage for *Beveridge curve* analysis. The most striking point is that not all unfilled jobs are included in the statistics concerning registered vacancies. Employers simply do not report all their unfilled jobs to the authorities (Jobcentres and Careers Offices) concerned. It is not known exactly to what extent the number of registered vacancies actually reflects the total number of unfilled jobs within firms; this is another huge registration problem. Regarding the United Kingdom, the Department of Employment suggests that about one third of the vacancies are registered with the Jobcentres¹⁷. In order to overcome this deficiency in the vacancy data, a correction factor has to be used to adjust the series. This correction factor is based upon the notion that the employment service's share in filling vacancies is not one hundred percent. Hence, the vacancy series has to be adjusted by a factor in order to cover for vacancies not reported to the employment service. Regarding the British data, a corrected vacancy series has been constructed, which shows indeed that about one third of the total number of vacancies in the economy are notified¹⁸. This correction factor is

¹⁷ See Department of Employment (1991a), p. S41.

¹⁸ The vacancy correction factor is computed in the following manner.

VOE = Vacancies Outflow as % of the number of engagements.

VIS = Vacancies Inflow as % of the number of separations.

$[(VOE + VIS) / 2]^{-1} * 100 = \text{vacancy correction factor (v.c.f.)}$.

See Jackman, Layard and Pissarides (1989), p. 383. Data on engagements and separations appeared on Inland Revenue 'P60' forms. Apparently, some administrative change in the Inland Revenue has made it impossible to collect these data since 1984.

based upon available data on the inflow and outflow of the vacancy stock, per annum, related to the number of separations and engagements, respectively.

table 2. Vacancy Correction Factor (v.c.f.) Great Britain (1).

Year	v.c.f.	Year	v.c.f.	Year	v.c.f.	Year	v.c.f.
1968	4.6189	1974	3.8911	1980	3.0864	1986 (2)	2.6691
1969	4.8900	1975	4.2194	1981	3.2733	1987 (2)	2.6960
1970	4.4150	1976	3.3753	1982	3.2362	1988 (2)	2.9048
1971	4.5558	1977	3.3278	1983	2.8818	1989 (2)	3.2278
1972	4.3573	1978	3.0257	1984	2.9112	1990 (2)	3.4018
1973	3.6900	1779	2.9718	1985 (2)	2.7590		

Notes on table 2.

- Ad.(1) Own computations based on data presented in Jackman, Layard and Pissarides (1989), 'On Vacancies', Oxford Bulletin of Economics and Statistics, p. 387.
- Ad.(2) These values of the v.c.f. have been computed. This has been done by regressing the v.c.f. series on British vacancy and unemployment data. On basis of this forecasts for the values 1985-1990 have been obtained. Also, see table 4.C. and the text.
-

Thus, the uncorrected vacancy rate is multiplied by a factor, varying from year to year, of around 3 to 4 (for further details regarding the British vacancy series see table 4.C. presented in section 3.2.). While looking at table 2., we can see that the correction factor has decreased over time¹⁹. This indicates that the role the employment service plays in the matching process has risen over time.

The situation in the Netherlands, as regards the reliability of registered vacancy data is not much different. The number of vacancies, as registered with the labour office, is considered to be far below the real number of vacancies in the

¹⁹ That is until 1987, but as described in the notes of table 2., the values for the v.c.f. for the years 1985-1990 are 'forecasts' and should therefore be interpreted with caution.

economy. Consequently, the CBS, the Netherlands Central Bureau of Statistics, has gathered more accurate vacancy data, by means of a vacancy survey ('vacature enquête'). Comparison of the various vacancy figures shows that the CBS vacancy figures are between two and three times greater than the number of vacancies registered with the labour offices²⁰.

table 3. Comparison of Dutch Vacancy Figures.

Year	V_{nl} (1)	V_{nl}cbs (2)	Year	V_{nl}	V_{nl}cbs
1980	53 920	52 000	1986	27 120	66 000
1981	20 950	27 000	1987	26 510	71 000
1982	11 280	18 000	1988	27 000	65 000
1983	9 500	24 000	1989	35 500	89 800
1984	15 270	35 000	1990	44 000	114 800
1985	25 550				

Notes on table 3.

Ad.(1) Source: see notes on table 4.A., Ad.(1).

Ad.(2) Source: Kwartaalbericht Arbeidsmarkt, Ministerie van Sociale Zaken en Werkgelegenheid, Derde Kwartaal 1990 and Eerste Kwartaal 1991. These data are not directly comparable due to the fact that over the years the vacancy surveys have not been taken place in the same month. In 1985 no vacancy survey was conducted. The figure for 1990 is based on data of the lately introduced quarterly vacancy survey whereas, the previous figures are based on the annual vacancy survey.

As is shown in table 3., the vacancy figures based upon registration with a labour office (V_{nl}) and the vacancy survey (V_{nl}cbs) diverge, notably from 1982 onwards²¹. The increase in aggregate unemployment with its expected positive

²⁰ See Ministerie van Sociale Zaken en Werkgelegenheid (1990a), pp. 5-10, and Ministerie van Sociale Zaken en Werkgelegenheid (1990b), pp. 22-23.

²¹ For further analyses as regards the characteristics of the Dutch vacancy figures during the eighties, see van Ours and Ridder (1991).

impact on the ease with which an employer fills a job, might have diminished the incentive for employers to register unfilled jobs with an employment office. Furthermore, it could be easier for employers to fill vacancies from within the firm. This could be the explanation for the divergence of the two vacancy series. However, the patterns of both series are more or less the same; a low level of vacancies in 1983\1984, followed by an increase of the number of Dutch vacancies which continued into the nineties.

Unfortunately, once again, the CBS figures are only available from the beginning of the eighties. Hence, as regards the total number of vacancies in the Netherlands, one can argue about the validity of constructing a consistent time series for the period 1960-1990, using the CBS data²².

Both in the United Kingdom and the Netherlands the notification of a vacancy with a Jobcentre or labour office is not compulsory²³. In Sweden notification has been mandatory since 1 October 1976²⁴. However, the introduction of obligatory notification, although it made comparison of the vacancy figures more difficult, did not seem to affect the Swedish vacancy figures a great deal.

Another point which should not be neglected is that the available data concern both men and women. It is therefore to be expected that the patterns in the vacancy (and aggregate unemployment) series, are dominated by the male series.

²² Despite this, we have constructed a Dutch vacancy series using the CBS data for the last decade (see section 3.2., table 4.C.). We will use this series later on in our econometric practices (see chapter 5.).

²³ In the United Kingdom the registration of vacancies was mandatory until 1956. See Ministry of Labour (1956), p. 377.

²⁴ See OECD (1982), p. 62.

For instance, with regard to the Netherlands the vacancy data have only been published for men and women together since 1980. This might be ideologically sound, as far as 'emancipation' is concerned, but it is a drawback for statistical analysis on the labour market.

It is to be expected that in the future, definitions and the methods of compilation, will continue to change. In particular, the methods of data collection and sample design will improve with the help of technology. For instance, in the United Kingdom, quarterly labour force Surveys will be introduced in 1992²⁵. As far as it concerns time series analysis, the need for readjustment of data series will doubtless remain.

²⁵ See Department of Employment (1991c), pp. 135-138.

3.2. Patterns in Unemployment and Vacancies.

In the previous sections, we have discussed at some length, the problems concerning the aggregate unemployment series and the data on the total number of registered vacancies. As we have seen, the construction of a consistent time series is not always easy. However, once a consistent time series has been obtained, we can use it to make inferences on the developments over time regarding the variable at hand. We can now turn to discussing the patterns of the aggregate unemployment figures and the total number of registered vacancies in the three countries concerned²⁶. As we can see from figure 1.A., figure 1.C. and table 4.A., there is a certain degree of similarity between the unemployment and vacancy patterns in the Netherlands²⁷ and Great Britain. Until the mid-seventies the levels of unemployment and registered vacancies were reasonably close to each other. During the eighties, in sharp contrast to the situation in the sixties and the beginning of the seventies, there was a massive discrepancy between the unemployment and vacancy levels in both countries. In the beginning of the eighties there was an enormous 'unemployment explosion' in both countries. The unemployment figures only started to decline in 1985 (the Netherlands) and 1986 (Great Britain), with the

²⁶ For analysis as regards the pattern of unemployment in OECD countries, see, among others, Alogoskoufis and Manning (1988), Layard, Nickell and Jackman (1991) and Newell and Symons (1985).

²⁷ For a survey of the developments as regards Dutch postwar unemployment, see Hartog and Theeuwes (1991). As regards an explanation of the character (structure) of Dutch unemployment, see Muysken (1984).

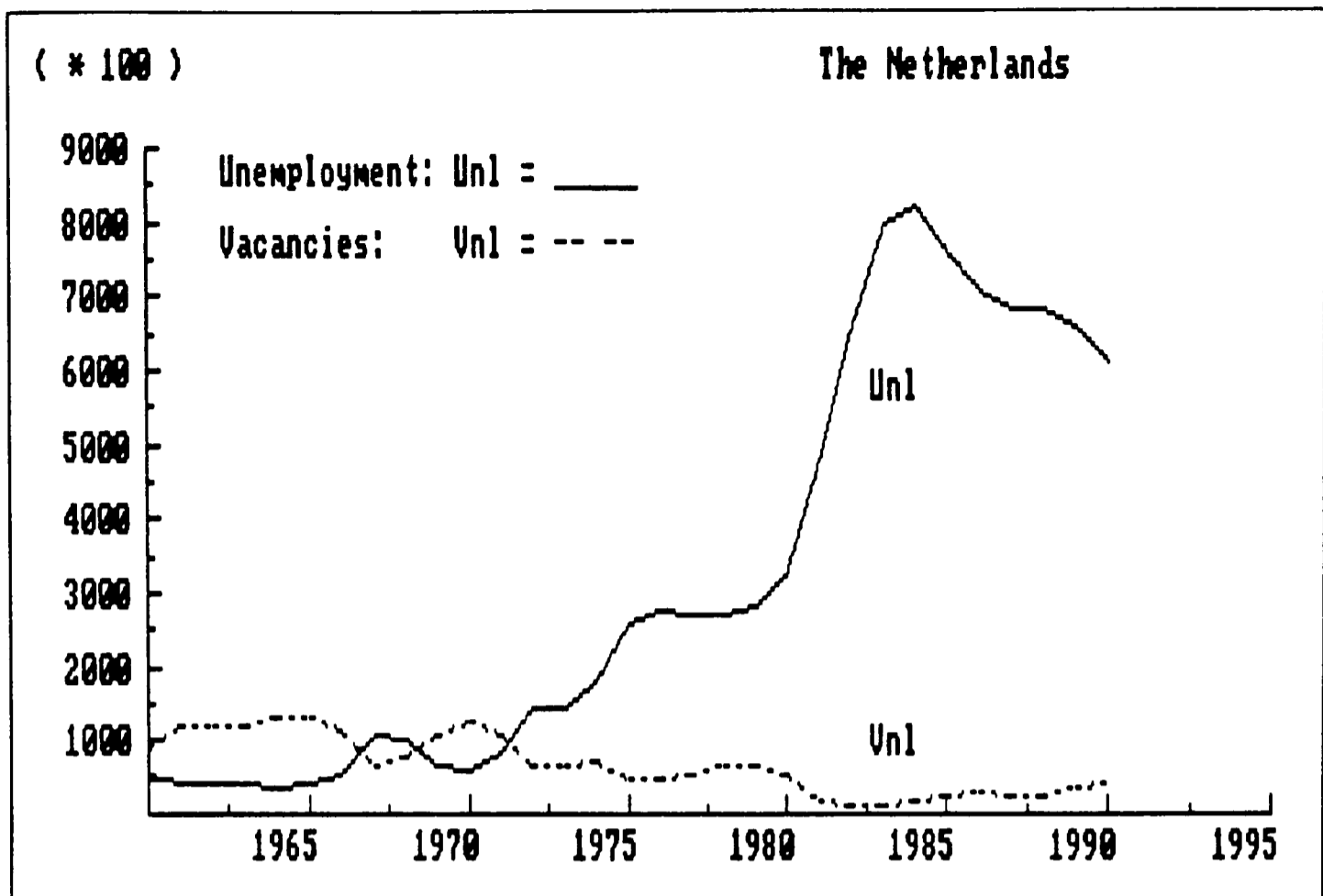


figure 1.A. Dutch Unemployment and Vacancies Patterns.

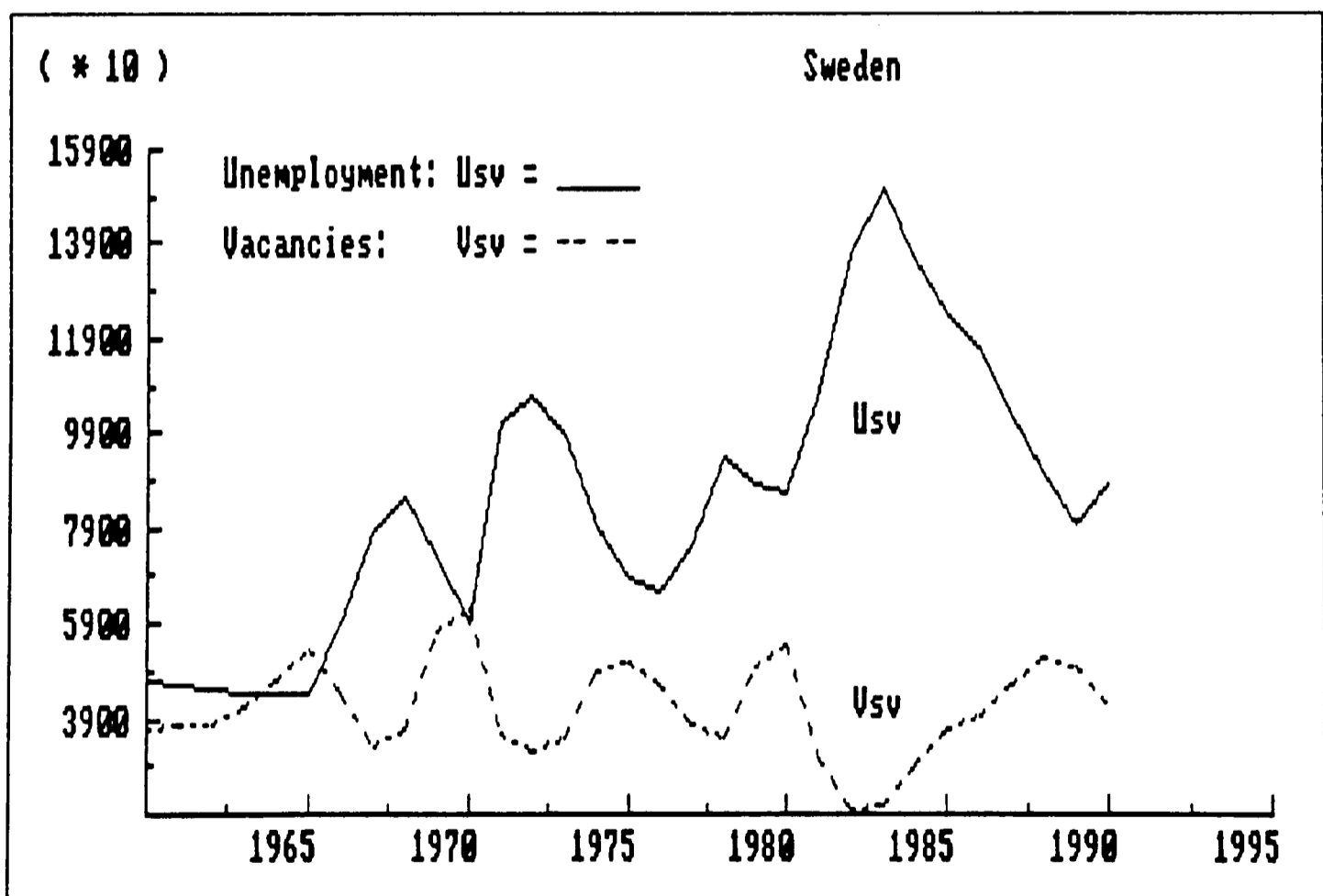


figure 1.B. Swedish Unemployment and Vacancies Patterns.

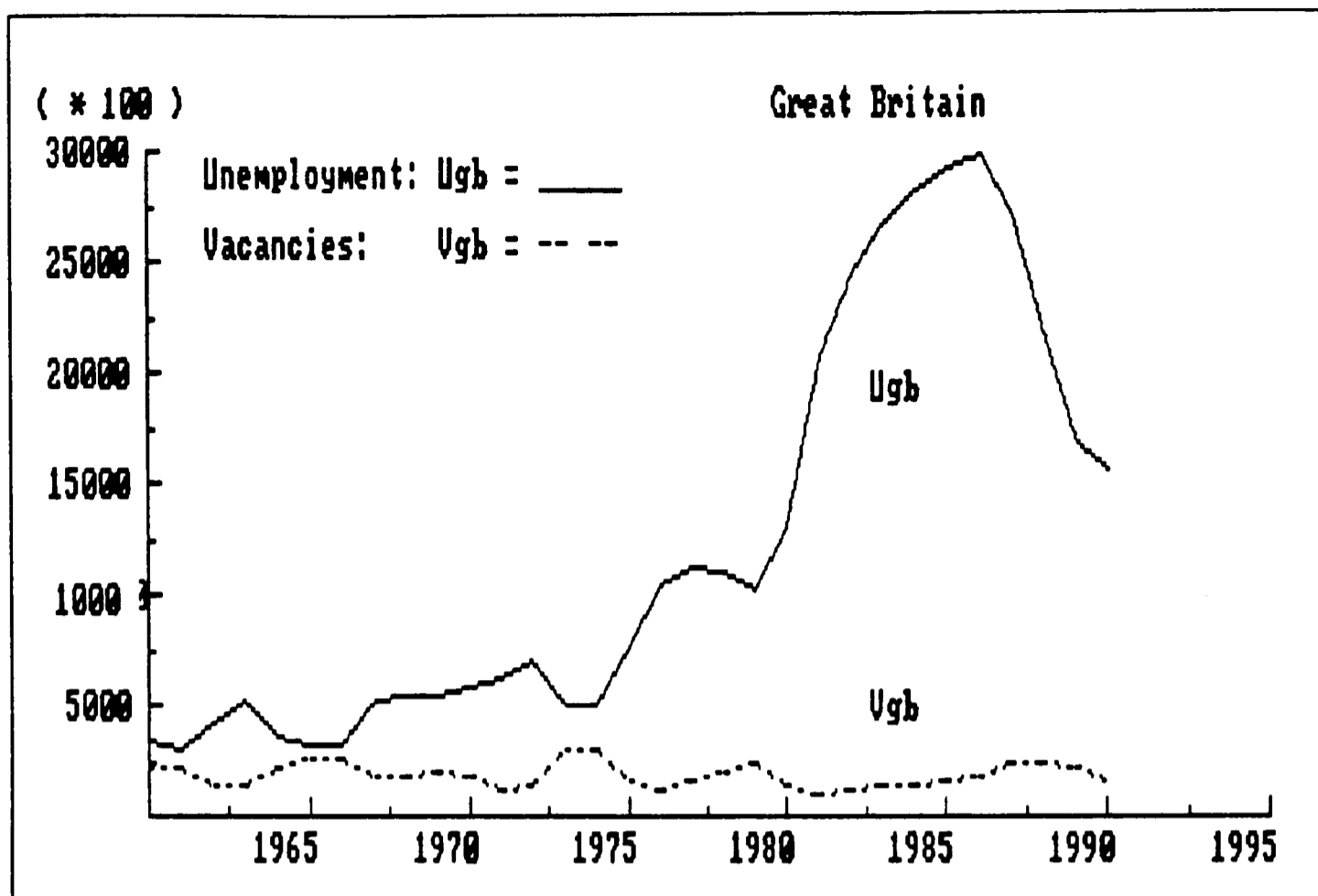


figure 1.C. British Unemployment and Vacancies Patterns.

British unemployment figures falling at a much faster rate (see table 4.A. and table 4.B.). It should be noted that for all three countries, unemployment figures were higher in the eighties than in the sixties²⁸.

Undoubtedly, the rise in unemployment (in the eighties) was caused by the 'second oil shock', *i.e.* the huge increase (doubling) of oil prices, turning the world's economy into recession. However, in this context it is of interest to record that both the Netherlands and Great Britain possess a substantial amount of natural

²⁸ As can be seen from table 4.A. and figure 1.A., the patterns over time of unemployment and registered vacancies concerning the Netherlands, are widely divergent from 1980 onwards. This is mainly due to the unemployment explosion, with at the same time an extremely low number of registered unfilled jobs. This could be regarded as empirical support for the 'Bulge-hypothesis'. This hypothesis is the notion that the high amount of (long-term) unemployment is mainly due to an enormous increase, within a given period, in the inflow into the unemployment stock, whereas after this 'high-inflow' period the inflow level reduces to 'normal' proportions.

table 4.A. Patterns of Unemployment and Vacancies (*).

(All figures * 1 000)

Year	Unemployment			Vacancies		
	U _{nl} (1)	U _{sv} (2)	U _{gb} (3)	V _{nl} (4)	V _{sv} (5)	V _{gb} (6)
1960	54.67	47.00	339.20	92.31	36.50	211.90
1961	41.49	46.00	306.40	118.53	38.00	213.30
1962	40.10	45.00	425.60	122.13	37.45	149.40
1963	42.28	44.00	513.10	121.58	41.60	143.80
1964	37.35	44.00	366.80	130.97	47.10	220.80
1965	43.18	44.00	313.00	129.15	53.80	265.10
1966	56.77	59.00	327.40	114.87	44.60	254.80
1967	110.54	79.00	516.80	68.22	32.60	174.00
1968	100.36	85.00	545.80	77.28	36.30	188.00
1969	65.34	73.00	541.10	106.32	56.90	199.60
1970	58.87	59.00	579.70	127.09	62.20	185.80
1971	82.11	101.00	620.80	106.63	36.00	129.00
1972	142.94	107.00	691.60	63.37	31.70	145.21
1973	145.53	98.00	490.00	67.05	35.30	303.61
1974	178.66	80.00	494.60	69.26	48.90	294.00
1975	258.65	68.00	763.60	47.20	50.30	151.00
1976	277.57	66.00	1 048.20	47.05	46.40	120.00
1977	270.83	75.00	1 113.30	55.38	38.00	152.75
1978	272.65	94.00	1 092.60	63.31	34.60	208.73
1979	280.53	88.00	1 022.90	68.07	49.40	240.00
1980	325.37	86.00	1 302.40	53.92	54.00	141.95
1981	479.80	108.00	2 087.70	20.95	30.00	96.30
1982	654.69	137.00	2 449.60	11.28	19.90	110.29
1983	800.64	151.00	2 683.80	9.50	20.80	144.00
1984	822.40	136.00	2 810.40	15.27	29.00	148.71
1985	761.03	124.00	2 923.00	25.55	36.40	160.51
1986	710.74	117.00	2 984.60	27.12	39.10	186.72
1987	685.47	103.00	2 700.20	26.51	46.10	231.45
1988	683.00	91.00	2 181.40	27.00	52.10	245.76
1989	660.00	80.00	1 678.80	35.50	50.20	215.77
1990	612.00	88.00	1 564.60	44.00	41.53	169.03

table 4.B. Patterns of Unemployment and Vacancy Rates (+).

Year	Unemployment rates			Vacancy rates		
	u_{nl}	u_{sv}	u_{gb}	v_{nl}	v_{sv}	v_{gb}
1960	1.29	1.32	1.41	2.21	1.04	.90
1961	.97	1.25	1.26	2.79	1.05	.89
1962	.92	1.22	1.74	2.82	1.02	.62
1963	.95	1.19	2.08	2.77	1.14	.59
1964	.83	1.19	1.48	2.93	1.29	.90
1965	.95	1.18	1.25	2.87	1.45	1.08
1966	1.24	1.56	1.30	2.51	1.19	1.03
1967	2.39	2.09	2.07	1.51	.88	.71
1968	2.15	2.22	2.20	1.69	.97	.77
1969	1.39	1.89	2.18	2.29	1.50	.82
1970	1.24	1.51	2.34	2.71	1.61	.77
1971	1.71	2.55	2.53	2.26	.93	.54
1972	2.96	2.70	2.81	1.35	.82	.61
1973	3.01	2.46	1.96	1.43	.91	1.23
1974	3.67	1.98	1.97	1.48	1.23	1.20
1975	5.17	1.65	3.03	1.00	1.24	.62
1976	5.51	1.59	4.14	.99	1.14	.49
1977	5.34	1.80	4.38	1.15	.93	.63
1978	5.31	2.24	4.27	1.30	.84	.85
1979	5.39	2.06	3.96	1.38	1.18	.97
1980	6.02	1.99	5.04	1.06	1.28	.58
1981	8.48	2.49	8.09	.40	.71	.41
1982	11.34	3.15	9.53	.22	.47	.47
1983	13.67	3.45	10.37	.19	.49	.62
1984	13.92	3.10	10.59	.30	.68	.63
1985	12.81	2.80	10.87	.47	.84	.67
1986	11.90	2.64	11.04	.52	.90	.78
1987	11.33	2.32	9.89	.49	1.06	.94
1988	10.99	2.03	7.92	.49	1.18	.97
1989	10.45	1.76	5.99	.63	1.12	.82
1990	9.60	1.91	5.54	.76	.92	.63

table 4.C. Adjusted Vacancy Rates.

Year	v_{nl}	vc_{nl} (1)	v_{gb}	vc_{gb} (2)	vcd_{gb} (3)
1960	2.21	2.21	.90	4.14	4.14
1961	2.79	2.79	.89	4.12	4.12
1962	2.82	2.82	.62	2.86	2.86
1963	2.77	2.77	.59	2.75	2.75
1964	2.93	2.93	.90	4.18	4.18
1965	2.87	2.87	1.08	4.97	4.97
1966	2.51	2.51	1.03	4.75	4.75
1967	1.51	1.51	.71	3.29	3.29
1968	1.69	1.69	.77	3.57	3.57
1969	2.29	2.29	.82	4.02	4.02
1970	2.71	2.71	.77	3.39	3.39
1971	2.26	2.26	.54	2.45	2.45
1972	1.35	1.35	.61	2.64	2.64
1973	1.43	1.43	1.23	4.57	4.57
1974	1.48	1.48	1.20	4.65	4.65
1975	1.00	1.00	.62	2.61	2.61
1976	.99	.99	.49	1.85	1.85
1977	1.15	1.15	.63	2.09	2.09
1978	1.30	1.30	.85	2.58	2.58
1979	1.38	1.38	.97	2.88	2.88
1980	1.06	1.02	.58	1.79	1.79
1981	.40	.52	.41	1.33	1.33
1982	.22	.35	.47	1.53	1.53
1983	.19	.47	.62	1.78	1.78
1984	.30	.69	.63	1.82	1.82
1985	.47	1.23	.67	1.95	1.85
1986	.52	1.25	.78	2.26	2.07
1987	.49	1.32	.94	2.74	2.54
1988	.49	1.18	.97	2.82	2.82
1989	.63	1.59	.82	2.38	2.64
1990	.76	1.99	.63	1.84	2.15

Notes on table 4.A.

- Ad.(*) All these data represent yearly averages.
- Ad.(1) Source: Ministerie van Sociale Zaken en Werkgelegenheid data-tape. Also, 'Kwartaalbericht Arbeidsmarkt', Ministerie van Sociale Zaken en Werkgelegenheid, third quarter 1990 and fourth quarter 1990.
- Ad.(2) Source: Statistik årsbok, Statistiska Centralbyrån (Statistics Sweden), 1965, 1971, 1978, 1990 and 1991.
- Ad.(3) Source: Employment Gazette, Department of Employment, July 1971, April 1989 and March 1991.
- Ad.(4) Source: see, (1). Also, Ecostat data-tape.
- Ad.(5) Source: OECD, Economic Surveys Sweden, 1964, 1972, 1981\1982 and 1990\1991. OECD, Main Economic Indicators, Historical Series, 1960-1979. Also, Statistik årsbok, 1991 and Ecostat data-tape.
- Ad.(6) Source: Employment Gazette, Department of Employment, June 1973, December 1976, December 1979, December 1983, December 1985, November 1987, September 1989 and March 1991. Also, Jackman, Layard and Pissarides, 1984.

Notes on table 4.B.

- Ad.(+) Own computations.

Notes on table 4.C.

- Ad.(1) Corrected Dutch vacancy series based on using CBS data for the last decade (see table 3.). The observation for 1985 has been obtained by comparing the v_{nl} and vc_{nl} series for the last nine years. The observation of v_{nl} for 1985 has been multiplied with this correction factor in order to obtain the observation of vc_{nl} for 1985.
- Ad.(2) Corrected British vacancy series based on the vacancy correction factor which computation is based on data presented in Jackman, Layard and Pissarides (1989), see the notes on table 2, Ad.(1). For the years up to 1968 and after 1984 no data on the v.c.f. are available. For the years up to 1968 the v.c.f. for 1968 has been used to compute vc_{gb} . For the years after 1984 the v.c.f. for 1984 has been used to compute vc_{gb} .
- Ad.(3) For the years up to 1984 see Ad.(2). To overcome the deficiency of a constant v.c.f. for the period 1985-1990, we have computed 'forecasts' on the values of the v.c.f. for this period (see the notes on table 2, Ad.(2)). The observations of vcd_{gb} for the years 1985 and after are have been obtained by multiplying v_{gb} with the 'forecast' v.c.f.'s.
-

resources: natural gas, the 'aardgasbel van Slochteren', and North Sea oil, respectively. Because of an increase in the oil price (the price of natural gas is linked with it) government revenue in these two countries rose as well, with a beneficial impact on the respective national economies. (The increase in the price of oil must have had a positive and exogenous impact on the trade balances of both countries.) Also, it must be noted that the start of the decline in unemployment figures coincides with the collapse of the price of oil in 1986.

The difference between the Dutch and British labour market patterns shows up when we look at the vacancy series. In Great Britain many vacancy figures of the eighties were as high as those in the seventies. In the Netherlands, on the other hand, the vacancy figures in the eighties reached an all time low, although there is an upward trend from 1987 onwards.

Over the last three decades, the Swedish unemployment and vacancy series have been the most stable of the three countries concerned²⁹. That is not to say that there have not been any observable shocks. There has been a substantial increase in Swedish unemployment due to the second oil shock (at the beginning of the eighties), and to a lesser extent, the first oil shock (1973-1974). In comparison with the Netherlands and Great Britain, however, the rise in the Swedish unemployment figure has been small. Regarding the Swedish vacancy series, we see that the level of unfilled vacancies has been rising since 1982, reaching a very high level in 1988. This level was only exceeded by the Swedish vacancy levels of 1969, 1970 and 1980. In combination with the low unemployment figures for the second

²⁹ For a description of the developments concerning the Swedish economy, see, among others, Calmfors (1991).

part of the eighties, this would indicate a situation of labour shortage³⁰.

We have to make some additional comments on the vacancy series presented in table 4.C. As stated before, we have used CBS data for the last decade to obtain the vc_{nl} series. Obviously therefore, this series is less consistent than the v_{nl} series. Also, the CBS data (based on surveys) have not been gathered in the same month. So, the impact of a possible 'seasonal trend' cannot be ruled out. However, we will only use the vc_{nl} series to investigate the sensitivity of our econometric results (see paragraph 5.2.1.). Our empirical analysis of the Dutch *Beveridge curve* will be based on v_{nl} .

Also described in the previous section are the deficiencies of the orthodox British vacancy series. In order to overcome those deficiencies a corrected British vacancy series (vc_{gb}) has been constructed. We will use this series for our econometric analyses of the British *Beveridge curve*. The main drawback of this series is the constant v.c.f. for the last six years. Therefore, we have constructed the vcd_{gb} series. This series will also be used to investigate the sensitivity of our results regarding the British *Beveridge curve* (see paragraph 5.4.1.). In figure 2. the corrected and original vacancy series for Great Britain are depicted (see the discussion in section 3.1.2.). At this stage it is worth noting that the gap between the two series gradually declines over time. As stated before, this could very well indicate the increased share of the employment service in the matching process.

In order to extend our discussion, we have to make some additional (see

³⁰ Remember that the Swedish unemployment figures for the years 1987-1990, as depicted in table 4.A., represent unemployment figures which were adjusted, and thus should be interpreted with caution, in order to make the Swedish unemployment series consistent. The official figures on Swedish unemployment, as gathered by means of the new measurement technique, are about 20 000 persons lower (see section 3.1.1.).

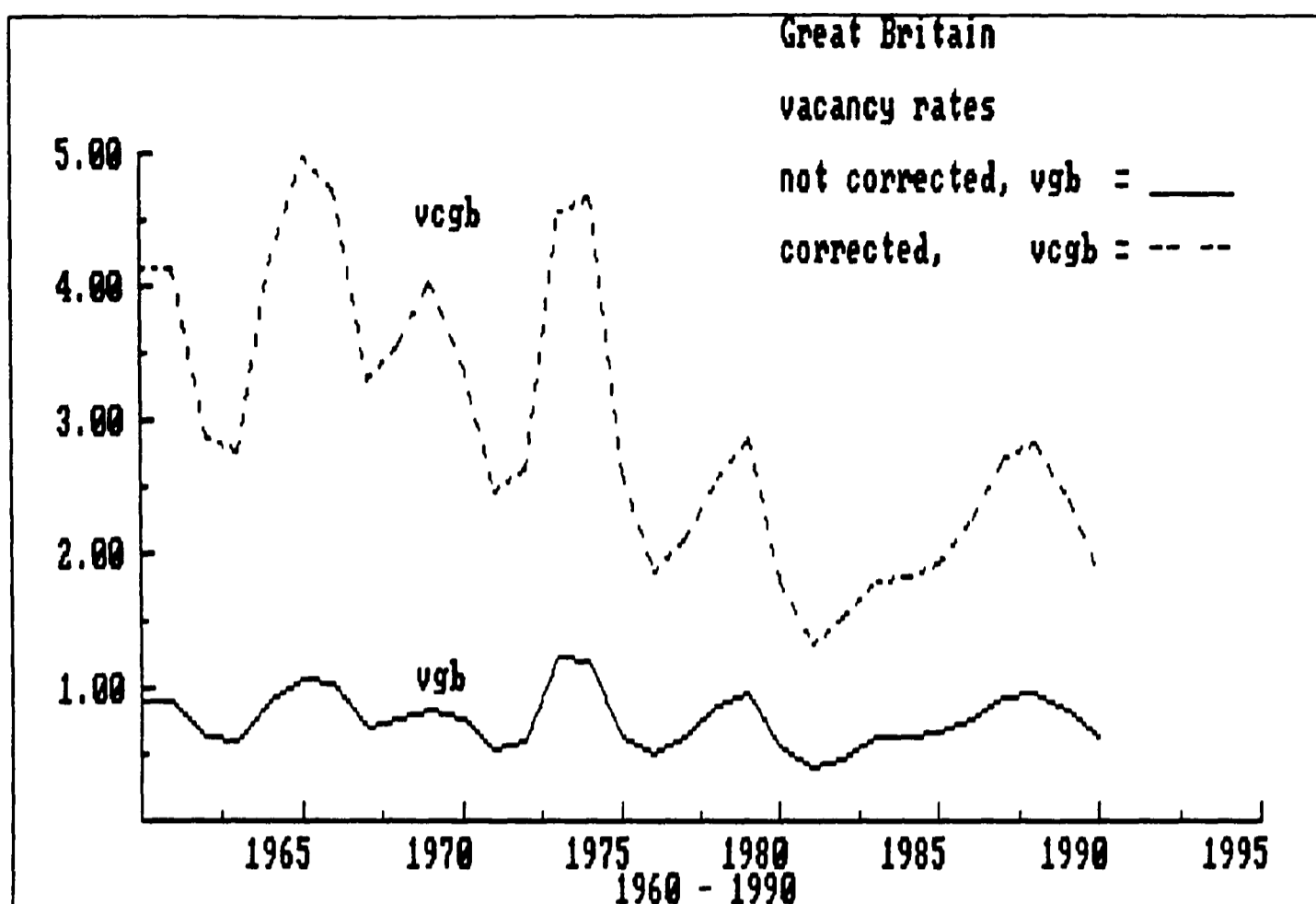


figure 2. British (Corrected) Vacancy Rates.

the notes on table 5.A.) remarks regarding the depicted employment series. In 1987 a revision took place in the Dutch employment series³¹. The CBS switched from the methods used while conducting the 'Arbeidskrachtentelling' (AKT) to new methods in accordance with the 'Enquête Beroepsbevolking' (see the discussion on the Dutch unemployment figures in paragraph 3.1.1.). This has led to an upward shift of around 500 000 persons in employment³². As was stated before, a new method was introduced regarding the Swedish labour force surveys, affecting the Swedish employment figures from 1987 onwards.

In order to construct the required unemployment and vacancy rates (see

³¹ For an interesting discussion of job duration and employment in the Netherlands, see Lindeboom and Theeuwes (1990).

³² The used Dutch employment data is corrected for this break in the series.

table. 4.B.) we require data on total employment (E), including armed forces personnel, and the labour force, unemployment and employment ($U+E$). Where, the unemployment rate $u = U/(U+E)$ and the vacancy rate $v = V/E$.

Referring to table 4.B., figure 3.A. and figure 3.B., we can, once more, state that the Swedish labour market patterns were the most stable over time. On the contrary, the Dutch patterns are the most volatile. The Dutch economy seems to be open to the winds. At the beginning of the sample period the Dutch economy, as regards aggregate unemployment, was the best performer with very low unemployment rates. At the same time the Netherlands faced relatively high vacancy rates. At the end of the sample period the situation is reversed with the Dutch economy exhibiting low vacancy rates and high unemployment rates³³. The British unemployment pattern is akin to the Dutch one, but the British vacancy rate has been comparatively stable over time.

As regards the employment and labour force patterns (see table 5.A. and table 5.B.), we can see that the British employment series has been remarkably stable over time (due to the relatively slow growth of the British labour force), whereas the Dutch and Swedish employment series show a clear upward trend over the years. At the beginning of the eighties, employment patterns in the three countries showed zero growth (the Netherlands and Sweden) or negative growth (Great Britain). Since 1984, employment in all three countries has been growing steadily. During the eighties the labour force (series: $U+E$) continued to grow in the Netherlands and Sweden, whereas from 1979 until 1984, the British labour force

³³ The new official Dutch figure regarding the unemployment rate (see section 3.1.1.) is around 5%, comparable with the British figure.

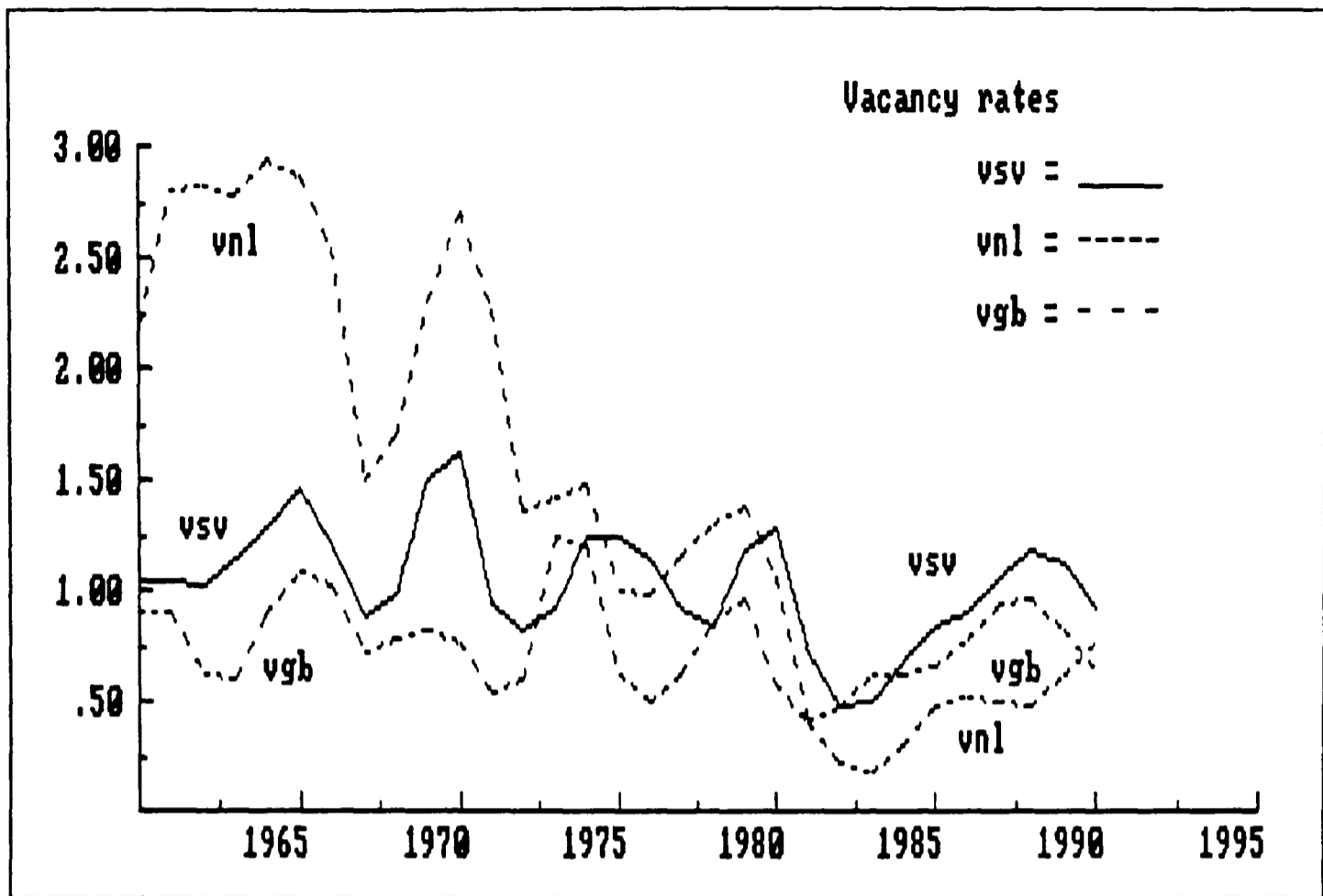


figure 3.A. British, Dutch and Swedish Vacancy Rates.

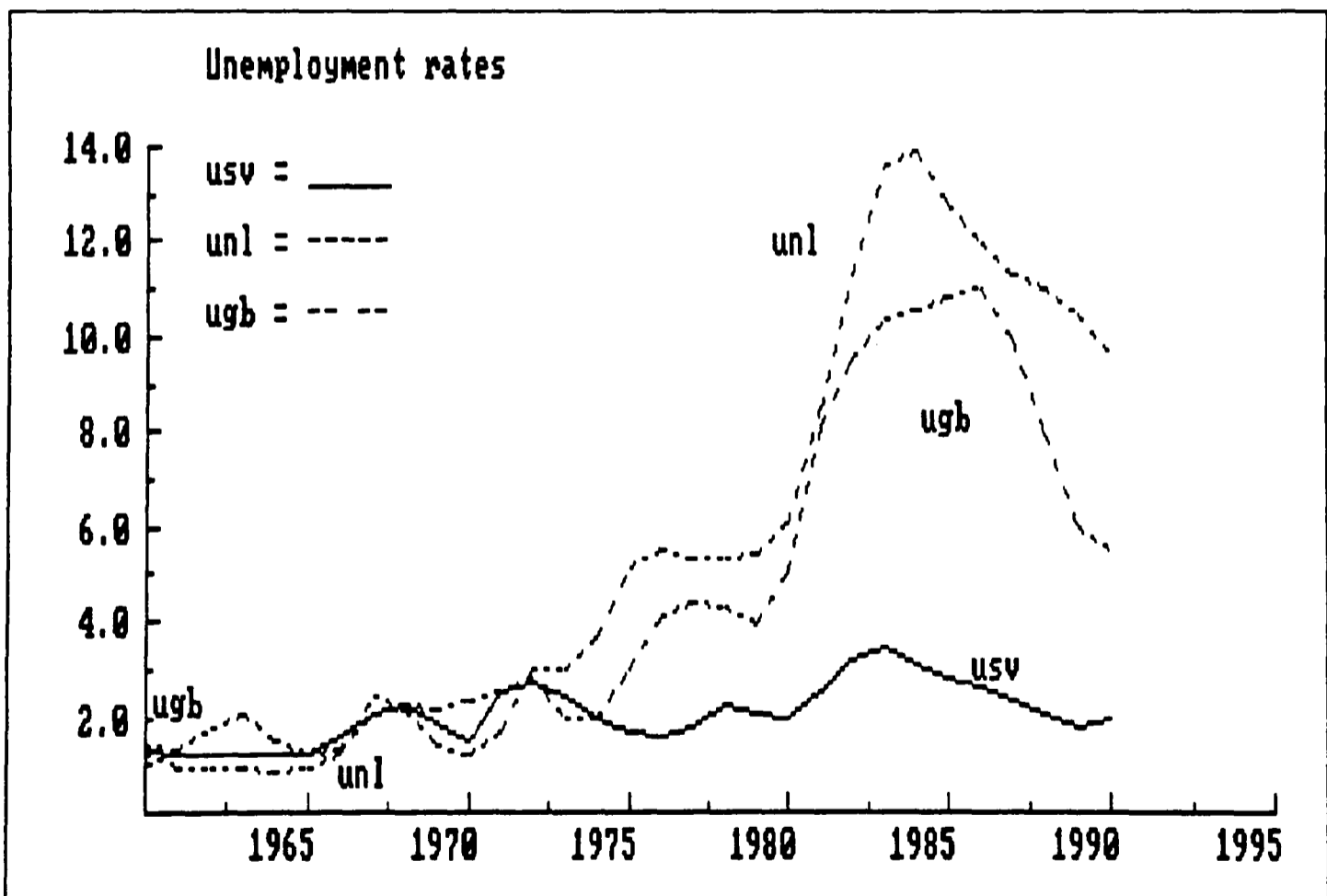


figure 3.B. British, Dutch and Swedish Unemployment Rates.

table 5.A. Patterns of Employment and the Labour Force (*).

Year	Labour Force			(All figures * 1 000) Employment		
	U+E _{nl} (1)	U+E _{sv} (2)	U+E _{gb} (3)	E _{nl} (4)	E _{sv} (5)	E _{gb} (6)
1960	4 237	3 568	23 984	4 182	3 521	23 645
1961	4 284	3 679	24 228	4 243	3 633	23 922
1962	4 368	3 702	24 514	4 328	3 657	24 088
1963	4 429	3 702	24 626	4 387	3 658	24 113
1964	4 501	3 704	24 759	4 464	3 660	24 392
1965	4 545	3 742	24 956	4 502	3 698	24 643
1966	4 594	3 792	25 128	4 537	3 733	24 801
1967	4 634	3 774	24 962	4 523	3 695	24 445
1968	4 665	3 822	24 834	4 565	3 737	24 288
1969	4 706	3 855	24 839	4 641	3 782	24 298
1970	4 755	3 913	24 763	4 696	3 854	24 183
1971	4 806	3 961	24 582	4 724	3 860	23 961
1972	4 826	3 970	24 639	4 683	3 863	23 947
1973	4 838	3 977	25 019	4 692	3 879	24 529
1974	4 867	4 042	25 086	4 688	3 962	24 591
1975	5 002	4 130	25 206	4 743	4 062	24 442
1976	5 034	4 149	25 320	4 756	4 083	24 272
1977	5 072	4 174	25 404	4 801	4 099	24 291
1978	5 132	4 199	25 576	4 859	4 115	24 484
1979	5 208	4 268	25 822	4 927	4 180	24 799
1980	5 402	4 318	25 824	5 077	4 232	24 522
1981	5 660	4 333	25 797	5 180	4 225	23 709
1982	5 774	4 356	25 707	5 119	4 219	23 257
1983	5 856	4 375	25 889	5 055	4 224	23 205
1984	5 906	4 391	26 533	5 084	4 255	23 723
1985	5 939	4 423	26 898	5 178	4 299	23 975
1986	5 969	4 427	27 035	5 258	4 310	24 050
1987	6 049	4 440	27 313	5 364	4 337	24 613
1988	6 215	4 490	27 530	5 532	4 399	25 349
1989	6 315	4 546	28 029	5 655	4 466	26 351
1990	6 374	4 596	28 264	5 762	4 508	26 699

table 5.B. Indexed Patterns of Employment and the Labour Force (*).

Year	Labour Force			(Index: 1985 = 100.) Employment		
	U+E _{nl}	U+E _{sv}	U+E _{gb}	E _{nl}	E _{sv}	E _{gb}
1960	71.34	80.67	89.17	80.76	81.90	98.62
1961	72.14	83.18	90.08	81.94	84.51	99.78
1962	73.55	83.70	91.14	83.58	85.07	100.47
1963	74.58	83.70	91.55	84.72	85.09	100.58
1964	75.59	83.74	92.05	86.21	85.14	101.74
1965	76.53	84.60	92.78	86.94	86.02	102.79
1966	77.35	85.73	93.42	87.62	86.83	103.45
1967	78.02	85.33	92.80	87.35	85.95	101.96
1968	78.55	86.41	92.33	88.16	86.93	101.31
1969	79.24	87.16	92.35	89.63	87.97	101.35
1970	80.06	88.47	92.06	90.69	89.65	100.87
1971	80.92	89.55	91.39	91.23	89.79	99.94
1972	81.26	89.76	91.60	90.44	89.86	99.88
1973	81.45	89.92	93.01	90.61	90.23	102.31
1974	81.94	91.39	93.26	90.54	92.16	102.57
1975	84.22	93.38	93.71	91.60	94.49	101.95
1976	84.75	93.81	94.13	91.85	94.98	101.24
1977	85.40	94.37	94.45	92.72	95.35	101.32
1978	86.41	94.94	95.09	93.84	95.72	102.12
1979	87.68	96.50	96.00	95.15	97.23	103.44
1980	90.96	97.63	96.01	98.05	98.44	102.28
1981	95.30	97.97	95.91	100.04	98.28	98.89
1982	97.21	98.49	95.57	98.86	98.14	97.01
1983	98.60	98.91	96.25	97.62	98.26	96.79
1984	99.45	99.28	98.64	98.18	98.98	98.95
1985	100.00	100.00	100.00	100.00	100.00	100.00
1986	100.50	100.09	100.51	101.54	100.26	100.31
1987	101.86	100.38	101.54	103.59	100.88	102.66
1988	104.65	101.51	102.35	106.84	102.33	105.73
1989	106.33	102.78	104.21	109.21	103.88	109.91
1990	107.32	103.91	105.08	111.28	104.86	111.36

Notes on table 5.A.

- Ad.(*) All these data represent yearly averages.
- Ad.(1) See, Ad.(4) concerning the Dutch employment series, and table 4.A., Ad.(1), regarding the Dutch unemployment series.
- Ad.(2) See, Ad.(5) concerning the Swedish employment series, and table 4.A., Ad.(2), regarding the Swedish unemployment series.
- Ad.(3) See, Ad.(6) concerning the British employment series, and table 4.A., Ad.(3), regarding the British unemployment series.
- Ad.(4) Source: Labour Force Statistics, 1959-1970, OECD, 1972, Labour Force Statistics, 1963-1974, OECD, 1976 and Labour Force Statistics, 1968-1988, OECD, 1990. Also, Rapportage Arbeidsmarkt 1990, Ministerie van Sociale Zaken en Werkgelegenheid.
- Ad.(5) Source: Labour Force Statistics, 1959-1970, OECD, 1972, Labour Force Statistics, 1963-1974, OECD, 1976 and Labour Force Statistics, 1968-1988, OECD, 1990. Also, Statistik årsbok, Statistiska Centralbyrån, 1991.
- Ad.(6) Source: Employment Gazette, Department of Employment, November 1989 and March 1991.

Notes on table 5.B.

- Ad.(*) Own computations.

growth came to a standstill. This could reflect the impact of the discouraged worker effect³⁴.

In this context we shall look at the patterns of participation rates in the three countries³⁵. The (male\female) participation rate is defined as the total (male\female) labour force for all ages divided by the total (male\female) population for ages 15-64[(U+E)/(U+E+N)]. N represents those in the total population who are not part of the labour force. Male participation rates have been

³⁴ The 'discouraged worker hypothesis' is the notion that under conditions of high unemployment, some of the unemployed are so demoralised by their very low chances of obtaining a job that they withdraw from the labour force. On the other hand, the 'added worker hypothesis' suggests that other members of the family would enter the labour force when the breadwinner (traditionally male) is unemployed, in order to sustain family income.

³⁵ See OECD (1990a), p. 468, pp. 492-493, and pp. 500-503.

continuously declining since the beginning of the seventies, with the male participation rates of the United Kingdom (1985: 87.7%) and Sweden (1985: 87.5%) at the same level. The Dutch male participation rate is at a significantly lower level (1985: 75.8%). The female participation rates in the Netherlands and Sweden have also been rising continuously since the start of the seventies. However, it has to be stressed that relative to international female participation rates the Dutch equivalent (1985: 41.0%) is very low, whereas the Swedish female participation rate is exceedingly high (1985: 79.7 , almost as high as the Swedish male participation rate). The female participation rate in the United Kingdom, at a level in between the Dutch and Swedish rates (1985: 62.6%), has been rising intermittently since the beginning of the seventies. For the period 1980-1983, the female participation rate declined in the United Kingdom. This was the period in which British unemployment rose to a very high level.

We can now focus on the long-run unemployment-vacancies relationship or *Beveridge curve*. As was discussed in chapter 2., the *Beveridge curve* reflects combinations of unemployment and vacancies where unemployment is not changing. Furthermore, the *Beveridge curve*, entailing an inverse relation between unemployment and vacancies, is only a steady state locus. The figures shown in table 6., do not depict the *Beveridge curve*. A shift of the curve is an increase in u (or v) at a given level of v (or u). However, the u/v ratios are another way of illustrating the labour market patterns in the three countries concerned. The ratios, as depicted in table 6., can change as a result of either u changing, or v changing or both u and v changing.

As we can see, the Swedish u/v ratio has been fairly constant over the

sample period, with the exception of the beginning of the eighties. In that same period the Dutch u/v ratio, and to a lesser extent the British one, rose to previously unknown heights, illustrating the massive excess of labour supply. In the beginning of the sample period the situation was completely the reverse, with u/v ratios less than one, reflecting a situation of excess demand for labour.

table 6. u/v Ratios (*).

Year	u/v_{nl}	u/v_{sv}	u/v_{gb}	Year	u/v_{nl}	u/v_{sv}	u/v_{gb}
1960	.58	1.27	1.57	1976	5.57	1.40	8.37
1961	.35	1.19	1.42	1977	4.63	1.94	6.97
1962	.33	1.19	2.80	1978	4.08	2.66	5.01
1963	.34	1.04	3.49	1979	3.90	1.74	4.09
1964	.28	.92	1.64	1980	5.67	1.56	8.71
1965	.33	.81	1.17	1981	20.97	3.51	19.92
1966	.49	1.30	1.27	1982	51.44	6.67	20.09
1967	1.58	2.37	2.91	1983	72.78	7.01	16.71
1968	1.27	2.29	2.84	1984	46.36	4.54	16.90
1969	.61	1.26	2.71	1985	27.03	3.31	16.23
1970	.46	.93	3.05	1986	23.09	2.91	14.22
1971	.76	2.73	4.69	1987	22.93	2.18	10.51
1972	2.19	3.28	4.63	1988	22.52	1.71	8.17
1973	2.11	2.71	1.58	1989	16.65	1.57	7.31
1974	2.49	1.60	1.65	1990	12.57	2.08	8.74
1975	5.20	1.33	4.90				

Notes on table 6.

Ad.(*)Own computations.

With reference to the plotted *Beveridge curves* (important, note the different scales) it is difficult to observe any shift of the Swedish *Beveridge curve* (figure 4.B.). If a shift in the Swedish *Beveridge curve* has taken place it must

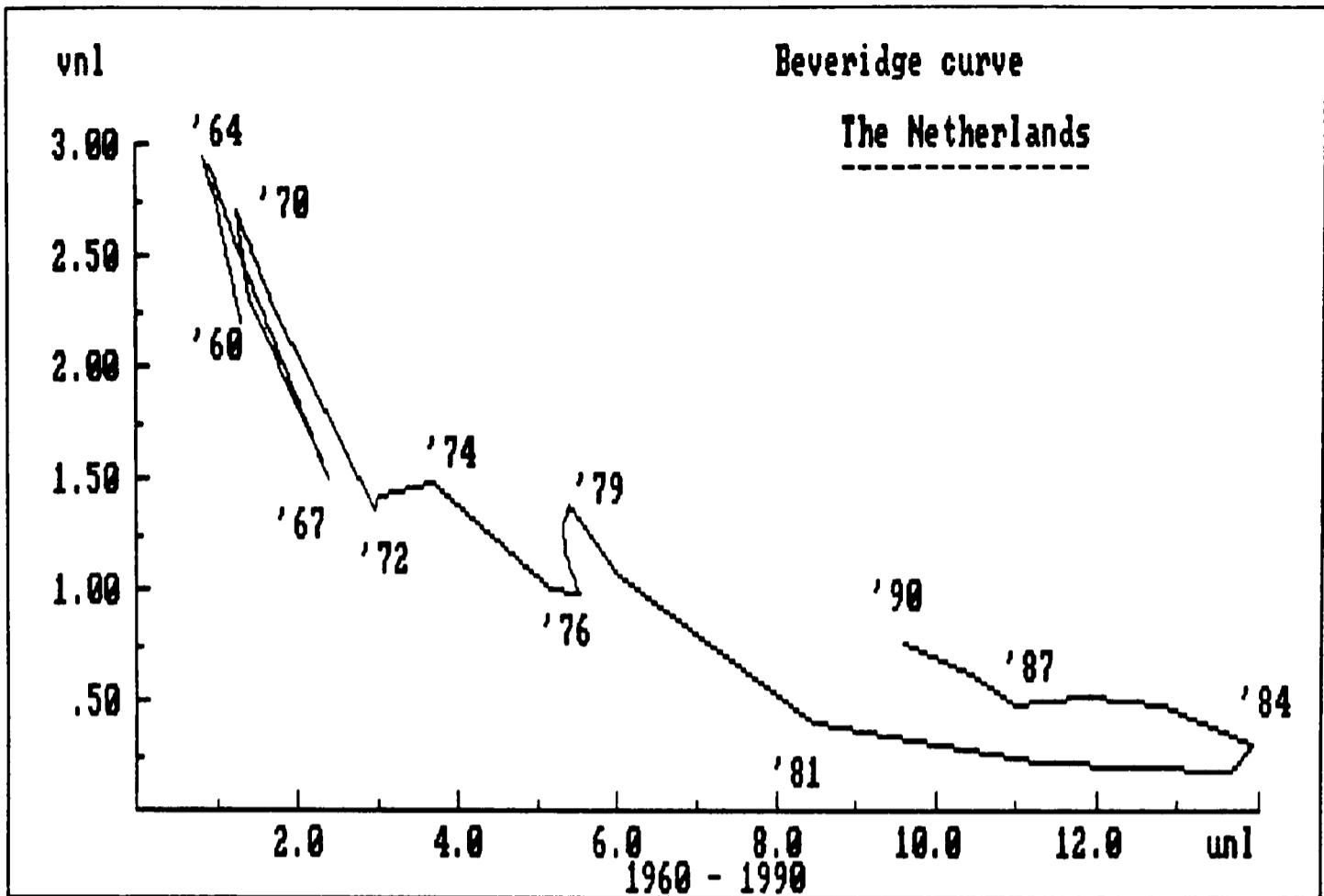


figure 4.A. The Dutch *Beveridge Curve*.

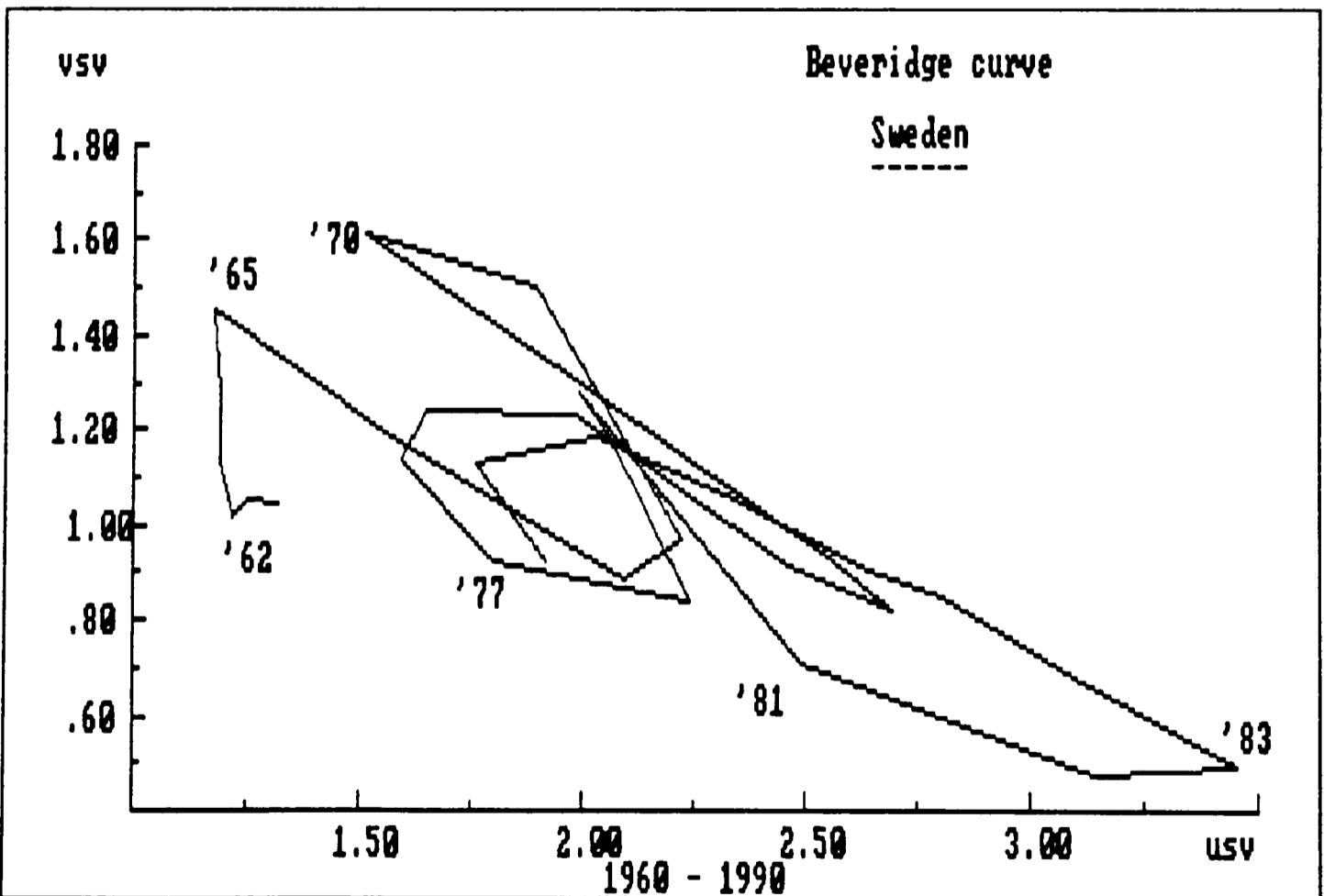


figure 4.B. The Swedish *Beveridge Curve*.

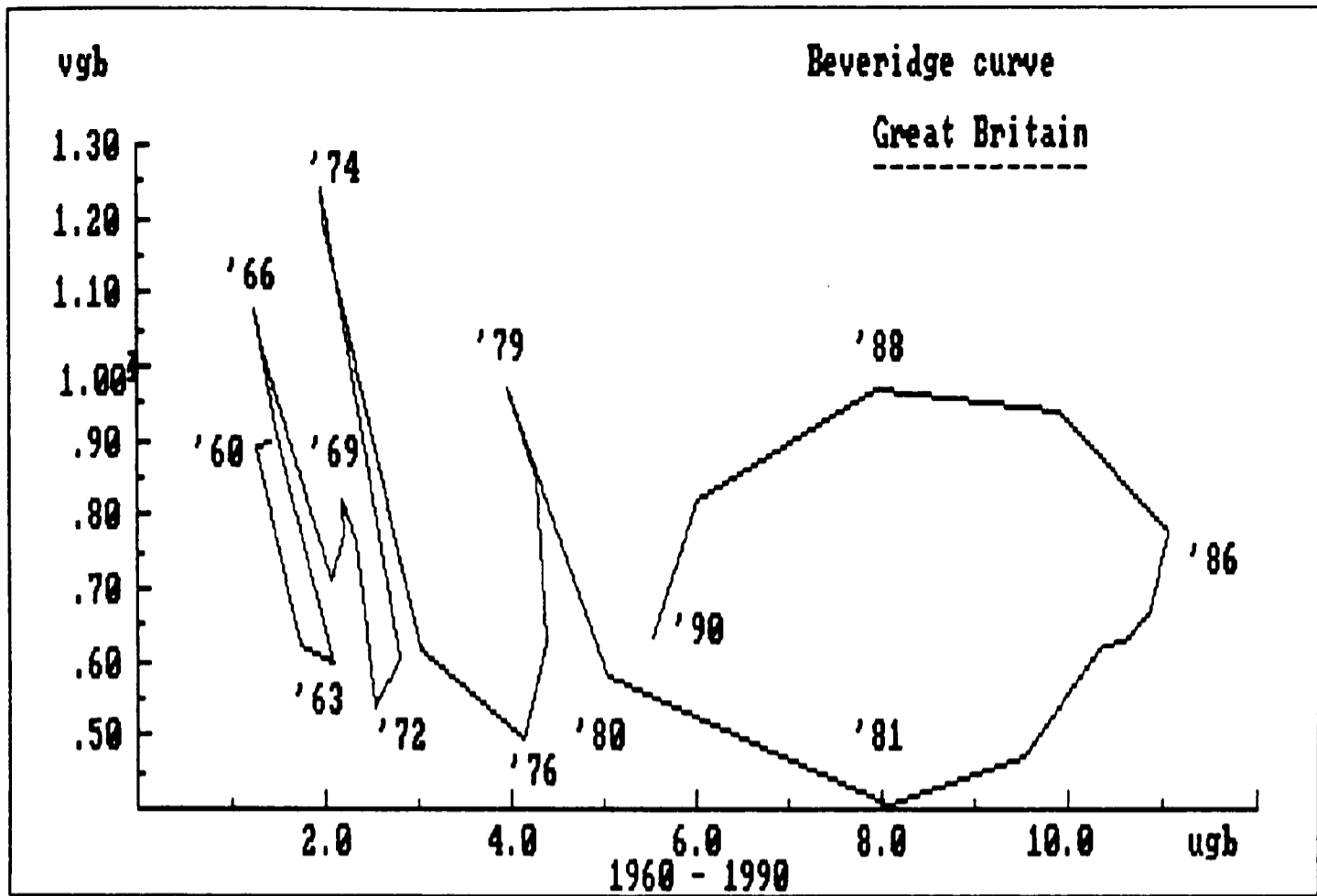


figure 4.C. The British *Beveridge Curve*.

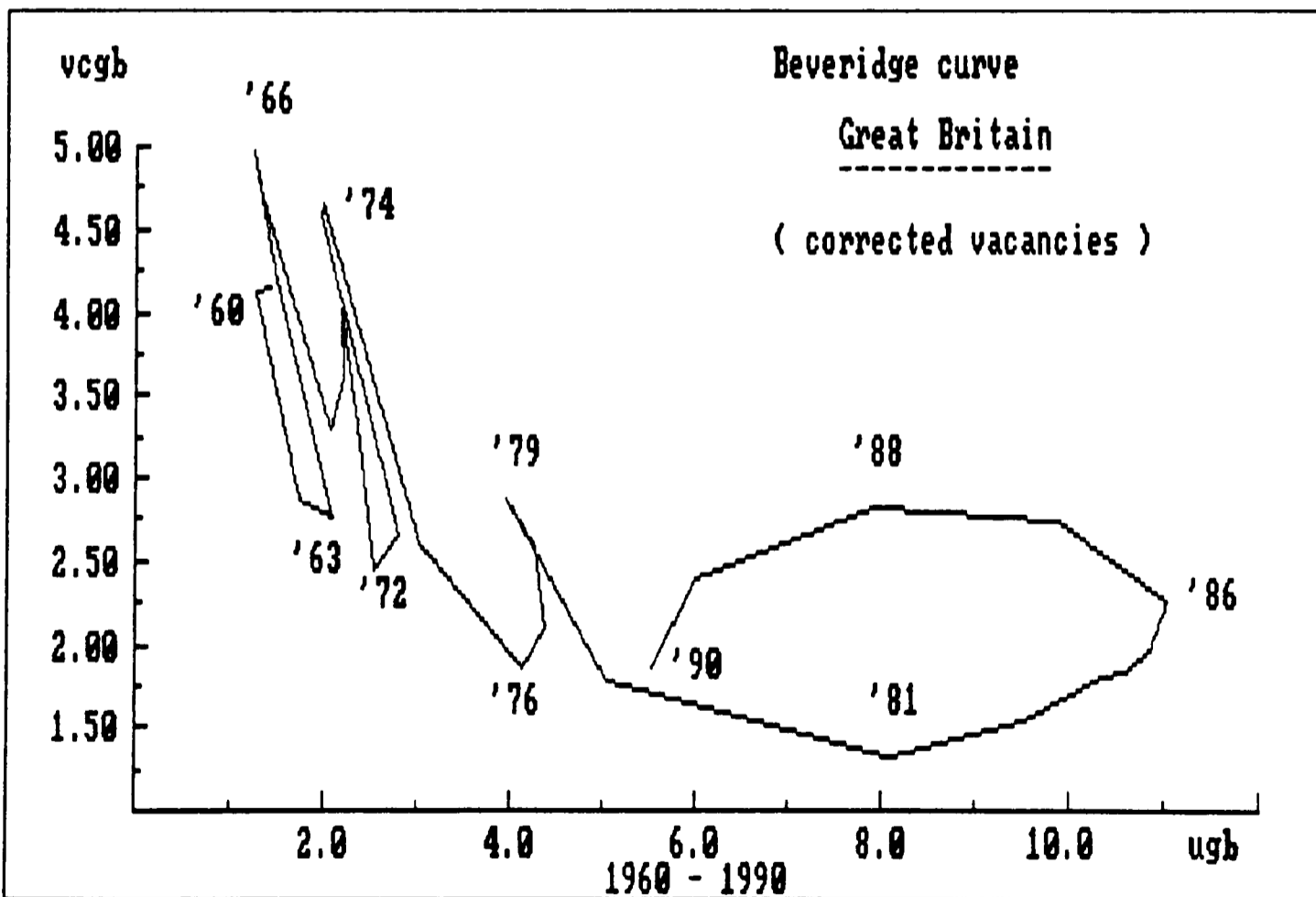


figure 4.D. The Adjusted British *Beveridge Curve*.

have done so at the very beginning of the sample period. Regarding the Dutch *Beveridge curve* (figure 4.A.) we observe over the sample period considerable movement towards the bottom right hand corner (eighties), depicting high u/v ratios.

As regards the British labour market, the *Beveridge curve* has been plotted both on the basis of the number of vacancies as registered with a Jobcentre (figure 4.C.) and the corrected vacancy series³⁶: the adjusted British *Beveridge curve* (figure 4.D.). Also, see the discussion in section 3.1.2.. The British labour market patterns cannot be explained solely by movements along the *Beveridge curve*. As we have already observed, in contrast to the Dutch vacancy rate, the British vacancy rate has been fairly stable over the sample period. It can be seen clearly, especially from the British *Beveridge curve* based on the uncorrected vacancy figures, that over the years there have been outward shifts of the British *Beveridge curve*. Approximately, we can say that at the beginning of each decade there occurred an outward shift of the British *Beveridge curve*, coinciding with the two episodes of increasing aggregate unemployment, as described above.

³⁶ The data on engagements and separations are only available for the period 1968-1984. For the years 1960-1967 the computed vacancy correction factor (v.c.f.) for 1968 has been used. Regarding the years 1985-1990 the v.c.f. for 1984 has been used. The corrected vacancy series regarding the whole sample period (1960-1990) should for that reason be interpreted with caution.

3.3. Mismatch Indices: Empirical Evidence.

In the following two sections we shall look briefly at the data on structural mismatch and long-term unemployment. As we have seen in section 2.4.2., structural mismatch is one of the variables which could be responsible for a shift of the *Beveridge curve*. Recalling equation (22.) depicting an indicator of structural mismatch:

$$1/2 * \{ \sum_i | [(U_i/U_{tot}) - (V_i/V_{tot})] | \} \quad (22.)$$

According to this definition an occupational mismatch index series for the period 1960-1987, has been constructed for the Netherlands³⁷. Classification by occupation was done according to the way in which a person is registered at the 'Gewestelijk Arbeidsbureau', *i.e.* the regional labour office. The labour office's classification (see the notes on table 7.) defines 16 occupations, *e.g.* sailors, farmers etc., upon which the constructed mismatch index is founded. Unfortunately, data on registered vacancies classified into occupations as described above, are no longer collected by the Dutch employment office. As can be seen in table 7. and

³⁷ Because of a lack of consistent data, we have not constructed a mismatch index series for Sweden. Furthermore, available data on unemployment per region for the eighties do not display striking disparities between the 24 regions. See, Statistiska Centralbyrån (1991), p. 58. Also, as we have seen above, Sweden does not really suffer from an unemployment problem. It therefore seems very unlikely that occupational or regional mismatch has played any part in determining the pattern of Swedish unemployment.

table 7. Mismatch Indices (*).

Year	mm_{nl} (1) no. of occupa- tions [16\15]	mm_{gbo} (2) no. of occupa- tions [24\18]	mm_{gbr} (3) no. of regions [11\10]
1960	.35		
1961	.34		
1962	.37	.43	.33
1963	.38	.39	.34
1964	.37	.42	.38
1965	.39	.41	.34
1966	.43	.42	.28
1967	.44	.37	.28
1968	.34	.38	.30
1969	.33	.39	.28
1970	.32	.38	.24
1971	.35	.37	.28
1972	.32	.37	.34
1973	.26	.40	.33
1974	.31	.41	.32
1975	.29	.43	.20
1976	.19	.38	.17
1977	.23	.35	.20
1978	.24	.35	.25
1979	.28	.35	.28
1980	.27	.37	.27
1981	.35	.41	.20
1982	.28	.37	.18
1983	.20		.14
1984	.16		.17
1985	.17		.18
1986	.19		.17
1987	.16		.17
1988			.20
1989			.17
1990			.10

Notes on table 7.

- Ad.(*) All these data represent yearly averages.
- Ad.(1) Source: Ministerie van Sociale Zaken en Werkgelegenheid data-disk. The classified occupations (16, for 1987: 15) are: landbouw, metaalbewerkend, textiel, bouwvak b&u, bouwvak gww, transport, handel, kantoor, onderwijs, horeca, huishoudelijk, kappers, sociaal-geneeskundig, scheepvaart (up to 1987) algemene dienst en overige beroepen.
- Ad.(2) Source: Jackman and Roper (1987), 'Structural Unemployment', Oxford Bulletin of Economics and Statistics, p. 20. Regarding the classified occupations (24, from 1973 onwards 18), see Jackman and Roper (1985), 'Structural Unemployment', Centre for Labour Economics Discussion paper no. 233, p. 50.
- Ad.(3) Source: regarding the years 1962-1980, Jackman, Layard and Pissarides (1984), 'On Vacancies', London School of Economics, Centre for Labour Economics Discussion paper no. 165, pp. 43-44. Regarding the years 1981-1990, Employment Gazette, Department of Employment, December 1983, February 1985, December 1985, November 1987, September 1989, December 1989, March 1991 and May 1991. The classified regions (11, from 1965 onwards 10) are: the South East (including Greater London), East Anglia, South West, East Midlands, West Midlands, Yorkshire and Humberside, North, North West, Wales and Scotland.
-

figure 5., the Dutch occupational mismatch index (mm_{nl}) generally had a higher value in the sixties and seventies than in the eighties. Also, we can see that at the beginning of the eighties the mismatch index increases, most probably due to the unemployment explosion. Immediately after this increase the Dutch mismatch index falls to a historically low level. This coincides with a high level of aggregate unemployment and extremely low vacancy figures (see table 4.A. and table 4.B.). All in all, the above suggests that developments in structural imbalances are probably not the explanation of the Dutch unemployment patterns.

Regarding Great Britain we use two mismatch index series³⁸. We use

³⁸ For a lengthy description of the features of structural mismatch and the used British data series, see Jackman, Layard and Pissarides (1984) and (1989). Also, see Jackman and Roper (1985) and (1987).

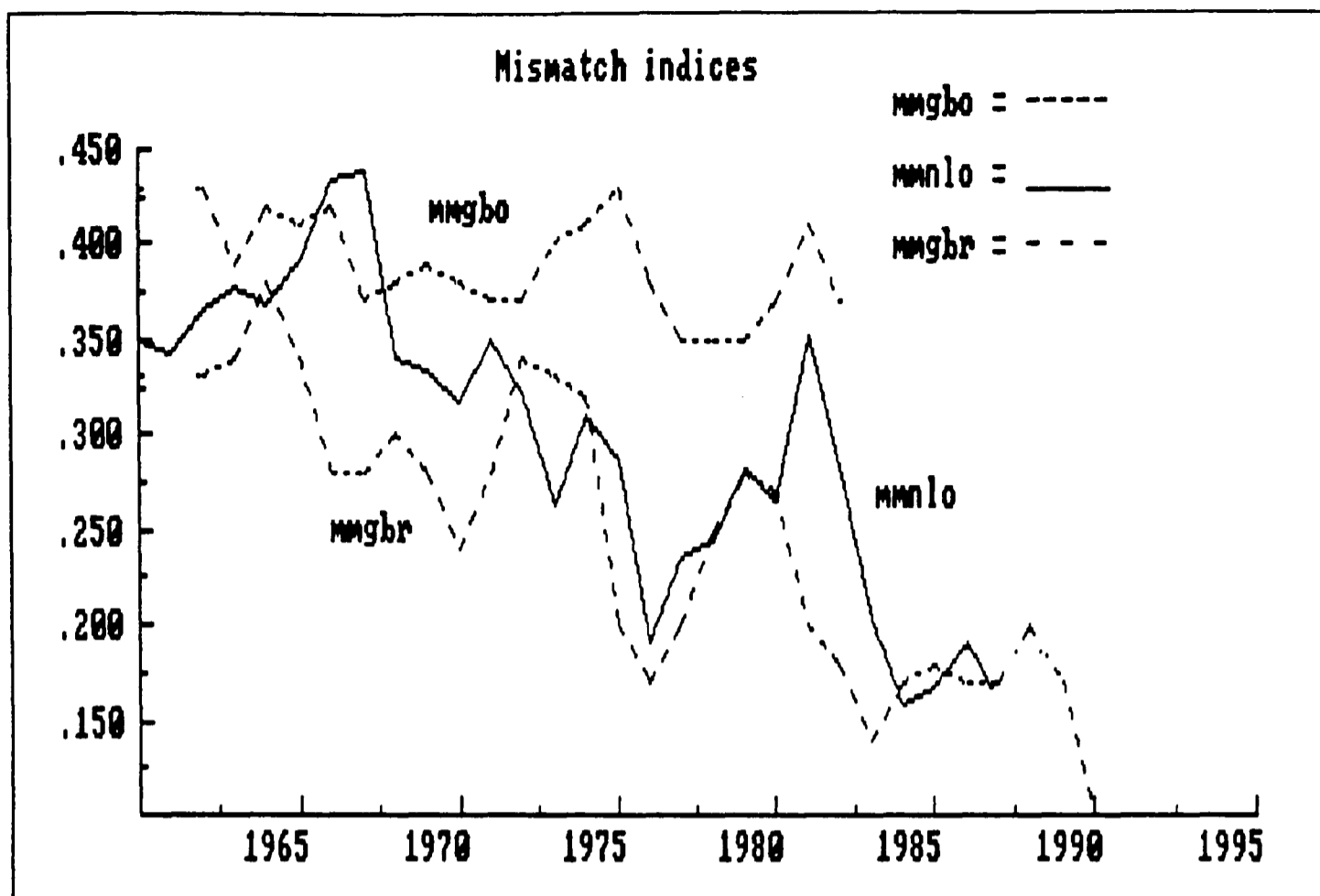


figure 5. British and Dutch Mismatch Indices.

a series on occupational mismatch based on twenty four different categories for the years 1962 to 1972. From 1973 onwards the index is based on eighteen occupations. The series on regional mismatch is based upon eleven categories for the years 1962 to 1964. From 1965 onwards the index is based on ten regions (see the notes on table 7.). The data on regional mismatch continues to be published by the Department of Employment. This is unfortunately, in contrast to the data on occupations which was last published in 1982. As can be seen (see table 7. and figure 5.), the British occupational mismatch index (mm_{gbo}) is fairly stable over time. On the other hand, the British regional mismatch index (mm_{gbr}) gradually declines during the sample period, reaching an all time low in 1990³⁹. This is

³⁹ For a regional analysis of the British *Beveridge curve*, we refer to Jones and Manning (1992).

primarily due to a sharp decline in mismatch in the South East.

Thus, in accordance with our findings for the Netherlands, it does not seem likely that the mismatch indices for Great Britain can explain the unemployment pattern very well. Note, in particular, that throughout the eighties, a low value of the regional mismatch index coincided with a high level of aggregate unemployment and a relatively stable level of vacancies.

3.4. Long-term Unemployment Ratios: Empirical Evidence.

In section 2.4., we have discussed the theoretical aspects of the relationship between long-term unemployment and the *Beveridge curve*. Now we turn to time series data on long-term unemployment.

A good indicator of the long-term unemployment feature is the long-term unemployment ratio (l_t), *i.e.* the ratio of the total number of long-term unemployed (LTU) and aggregate unemployment (U):

$$l_t = LTU/U \quad (28.)$$

In Great Britain and the Netherlands those who have been unemployed for more than one year are regarded as long-term unemployed; in Sweden the threshold is six months. This itself indicates that in Sweden long-term unemployment might not be of such significance regarding the unemployment pattern.

As we have seen in section 3.2., since the mid-seventies, unemployment rates have been at a relatively high level in the Netherlands and Great Britain, whereas the Swedish unemployment rate does not show such a pattern. The question is, of course, whether the long-term unemployment feature, with its implications for search intensity and search effectiveness of the unemployed can explain, at least in part, the unemployment patterns in the countries concerned. In accordance with equation (28.), the long-term unemployment ratio has been com-

puted for Great Britain, the Netherlands and Sweden. The data are depicted in table 8., figure 6.A. and figure 6.B..

As we can see from table 8. and figure 6.A., the British long-term unemployment ratio (lt_{gb}) seems to be less volatile than that of the Netherlands. The Dutch long-term unemployment ratio (lt_{nl}) was exceptionally low at the end of the sixties and the beginning of the seventies. A sharp increase in the number of long-term unemployed occurred at the beginning of the eighties and since then, the Dutch long-term unemployment ratio has remained at this very high level⁴⁰. The British long-term unemployment ratio has never been lower than 10% during the period 1960-1990.

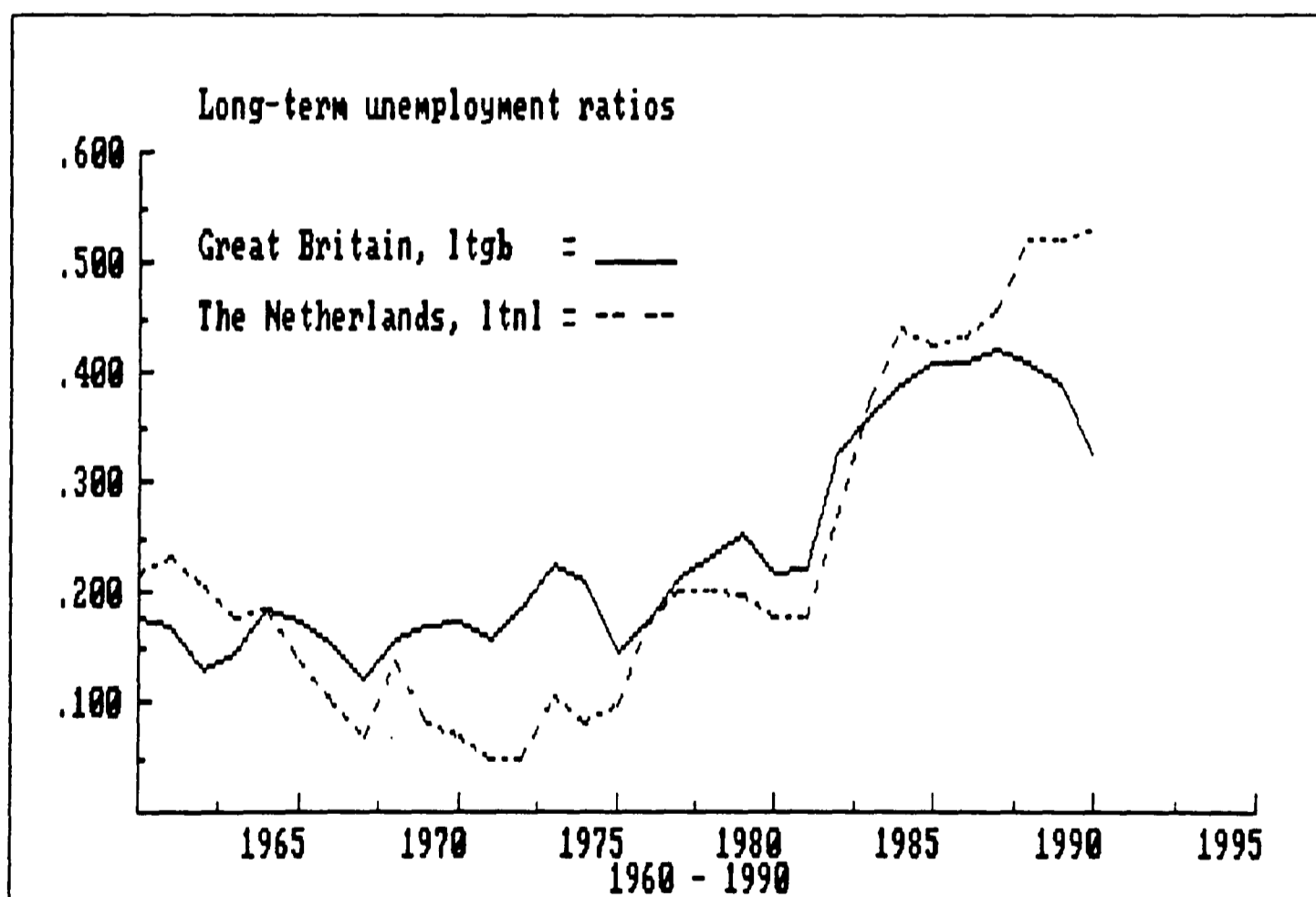


figure 6.A. British and Dutch Long-term Unemployment Ratios.

⁴⁰ Regarding the feature of the Dutch long-term unemployment experience see, among others, Organisatie voor Strategisch Arbeidsmarktonderzoek (1985), in particular chapter 5.

table 8. Long-term Unemployment Ratios (*).

Duration threshold -----	twelve months	twelve months	six months
Year	lt_{nl} (1)	lt_{gb} (2)	lt_{sv} (3)
1960	.2143	.1773	
1961	.2328	.1699	
1962	.2042	.1283	
1963	.1754	.1423	
1964	.1848	.1843	
1965	.1379	.1728	
1966	.0995	.1530	
1967	.0684	.1103	
1968	.1363	.1551	
1969	.0814	.1700	
1970	.0684	.1700	
1971	.0474	.1571	.1260
1972	.0463	.1858	.1760
1973	.1025	.2236	.1880
1974	.0799	.2077	.1660
1975	.0950	.1437	.1650
1976	.1720	.1703	.1600
1977	.2014	.2120	.1630
1978	.2011	.2313	.1830
1979	.1979	.2540	.1960
1980	.1747	.2153	.1770
1981	.1770	.2188	.1840
1982	.2671	.3255	.2230
1983	.3751	.3595	.2500
1984	.4380	.3893	.2810
1985	.4247	.4063	.2730
1986	.4329	.4090	.2200
1987	.4560	.4185	.2310
1988	.5198	.4090	.2120
1989	.5181	.3868	.1850
1990	.5294	.3235	.1650

Notes on table 8.

- Ad.(*) All these data represent yearly averages.
- Ad.(1) Source: Ministerie van Sociale Zaken en Werkgelegenheid data-tape. Also, Kwartaalbericht Arbeidsmarkt, Ministerie van Sociale Zaken en Werkgelegenheid, Derde Kwartaal 1990 and Vierde Kwartaal 1990. These are own computations based on the corrected unemployment figures, see section 2.1.1..
- Ad.(2) Source: Employment Gazette, Department of Employment, January 1960, April 1960, July 1960, October 1960, January 1961, April 1961, July 1961, October 1961, January 1962, April 1962, August 1962, November 1962, February 1963, May 1963, October 1966, July 1970, July 1971, December 1973, June 1977, May 1980, June 1982, February 1984, April 1985, June 1986, June 1987, June 1988, June 1989, June 1990 and March 1991. Regarding the years 1980-1990 it is assumed that the long-term unemployment ratio for the United Kingdom is the same as for Great Britain.
- Ad.(3) Source: Data-tape based on Swedish Labour Force Surveys as published by the Statistiska Centralbyrån. Note, the Swedish long-term unemployment data reflect a duration of the unemployment spell of more than six months. Thus, the Swedish data are not directly comparable with the Dutch and British long-term unemployment figures (duration threshold is twelve months).
-

In comparison with the Dutch long-term unemployment ratio, the British long-term unemployment ratio has been relatively stable up to the beginning of the eighties, at which point it began to rise (as did aggregate unemployment in both countries, see tables 4.A. and 4.B.). The share of long-term unemployment in aggregate unemployment was about forty percent in the second half of the eighties. Again, in contrast to the Dutch long-term unemployment ratio, the British long-term unemployment ratio has been in decline since 1987.

Theoretically, ceteris paribus, this behaviour of the British long-term unemployment ratio was not expected. A decline in the aggregate unemployment figures (see table 4.A.), *i.e.* the denominator of the long-term unemployment ratio, see equation (28.), is expected to be accompanied by an increase in the long-term

unemployment ratio in the short-run. The long-term unemployed are expected to have a lower than average chance of obtaining a job. We will return to this point later on in this section.

We now briefly discuss Dutch measures aimed at the reduction of the long-term unemployment problem⁴¹. First, the 'Wet Vermeend\N Moor', aimed at the very long-term unemployed. This law allows employers not to pay employers contributions for the employed long-term unemployed for a maximum of four years⁴². Second, the 'Jeugdontplooingsbanenplan' (JOB) aimed at the young long-term unemployed; private and public sector employers can employ the young unemployed at a reduced rate. Third, the 'Maatregel Ondersteuning Arbeidsinpassing', which endorses financial support to training of the long-term unemployed in order to improve their chances of finding a job. The 'Kaderregeling Arbeidsinpassing' (KRA) implemented in 1990, is the 'integrating' successor of these measures, but it also provides for 'heroriënteringsgesprekken', *i.e.* interviews with, and assistance for, the very long-term unemployed as regards their employability⁴³.

⁴¹ For an extensive overview of all the Dutch measures aimed at the increase of the employability of the unemployed, *i.e.* wage cost subsidies and schooling and training programs with respect to long-term unemployment, youth unemployment, unemployment of ethnic minorities etc., see Ministerie van Sociale Zaken en Werkgelegenheid (1988), pp. 59-62, Ministerie van Sociale Zaken en Werkgelegenheid (1990a), pp. 74-92, and Ministerie van Sociale Zaken en Werkgelegenheid (1991), pp. 81-88.

⁴² Although this policy has ceased to exist, and is succeeded by the KRA, spending commitments can continue for four years. Thus, commitments started in 1987 could still affect the figures for 1990. This, in part, could be the reason for the increase in spending figures as regards the labour market policies aimed at the long-term unemployed, see table 9.A. below.

⁴³ There are more labour market policies in effect. For instance, the 'Werkgelegenheid verruimende maatregel' (WVM) endorses job creation with non-profit organizations. This policy is aimed at upon ethnic minorities and women who want to re-enter the labour market (since 1989 the program is only meant for people originating from the

<u>table 9.A.</u>	<u>Means w.r.t. Dutch Long-term Unemployment Measures (*).</u>						
Year	1984	1985	1986	1987	1988	1989	1990
----- variable							
means(1)	78.8	69.5	55.7	87.7	86.6	112.1	203.2
U_{nl}(2)	822.4	761.0	710.7	685.5	683.0	660.0	612.0
It_{nl}(3)	.438	.425	.433	.465	.520	.518	.529
SLP(4)	78.8	73.8	62.3	100.0	97.5	128.5	241.7

Notes on table 9.A.

- Ad.(*) These are annual figures.
 Ad.(1) Spending in millions of guilders. Source: Ministerie van Sociale Zaken en Werkgelegenheid, Rapportage Arbeidsmarkt 1991, p. 85.
 Ad.(2) Source: see table 4.A., Ad.(1).
 Ad.(3) Source: see table 8., Ad.(1).
 Ad.(4) SLP: index denoting total spending on labour market measures for the long-term unemployed divided by the total number of unemployed and the average annual wage. Source: see, Ad.(1) and Ad.(2). Also, see Statistical Yearbook 1991 of the Netherlands, Centraal Bureau voor de Statistiek and Economisch Beeld 1991, Centraal Planbureau.
-

In table 9.A., we present some data on Dutch labour market measures as regards the long-term unemployed. Spending on measures especially aimed at the long-term unemployed has increased since 1987. With the introduction of the KRA spending has increased substantially. We may therefore conclude that Dutch policy

Molukken: a group of islands in what used to be the Dutch Indies). Spending on this program was relatively high in the years 1984 and 1985. Moreover, there is a program to fund job-creation for young persons at local community level (JWG). However, it is not possible to establish whether the participants of these programs, especially with regard to the various schooling measures, can be regarded as long-term unemployed. However, it is quite possible that a substantial percentage of those enlisted on the WVM program, especially for the years 1984 and 1985, can be regarded as previously long-term unemployed.

makers have become fully aware of the persistence of the long-term unemployment problem. In paragraph 5.2.3. we will investigate the impact of the policies on the Dutch long-term unemployment pattern. As noted above, the decline of the British long-term unemployment ratio since 1987 comes as a bit of a surprise, given falling aggregate unemployment and the suspected lower than average employability of the long-term unemployed. The decline of the British long-term unemployment ratio can only be explained in terms of a changed attitude on behalf of the authorities w.r.t. the long-term unemployed⁴⁴.

To explain this point we should discuss briefly some British measures aimed at reducing the long-term unemployment burden. To that effect, two notable labour market programs were introduced in the eighties: the 'Community Program' and the 'Restart Program'. The 'Community Program', introduced in 1982, enhanced provision of temporary jobs for those who were eligible and willing to participate⁴⁵. In practical terms, this meant that most of the participants were 18 to 24 years of age who had been unemployed previously for at least six months. The 'Community Program' was substantially expanded in 1983-1984 (also, see table 9.B.), before being abolished in 1988. The latter was due to the belief that 'Community Program' projects were of lesser economic priority. Also, the 'Community Program' did not provide experience of normal working environments⁴⁶.

The inception in 1986, and its extension to those unemployed for

⁴⁴ See Atkinson and Micklewright (1989).

⁴⁵ For a lengthy discussion of the 'Community Program' see, Disney et al. (1992), especially pp. 164-174, and Haskel and Jackman (1988).

⁴⁶ See Disney et al. (1992), p. 173.

table 9.B. British Long-term Unemployment Measures (*).

(All figures * 1 000)

Year	1982	1983	1984	1985	1986	1987	1988	1989	1990
----- variable							(+)		
CPLT (1)	29.75	71.50	119.75	144.75	220.25	233.25	206.67		
RESTART (2)					750	2 164	2 248	2 142	1 897

Notes on table 9.B.

Ad.(*) These data represent yearly averages.

Ad.(+) Data on the 'Community Program' is available until September 1988. In order to compute a yearly average for 1988, we have extrapolated the monthly data available for the first eight months of 1988. Thus, this figure should be interpreted with caution.

Ad.(1) CPLT: number of beneficiaries of the 'Community Program'. Source: for the years 1982-1985, see Haskel and Jackman (1988), 'Long-term Unemployment in Britain and the Effects of the Community Programme', Oxford Bulletin of Economics and Statistics, p.393. For the years 1986-1988, see Employment Gazette, Department of Employment, May 1986, June 1986, August 1986, October 1986, November 1986, January 1987, March 1987, May 1987, July 1987, September 1987, November 1987, January 1988, March 1988, May 1988, July 1988, September 1988 and October 1988.

Ad.(2) RESTART: number of interviews held in the context of the 'Restart Program'. Source: for the years 1986-1989, see Disney and Carruth (1992), 'Helping the Unemployed, Active Labour Market Policies in Britain and Germany' (a summary report), p. 3. For 1990, see Employment Gazette, Department of Employment, March 1990, June 1990 and February 1991.

six months or more in 1987, of the 'Restart Program' is no doubt due to the notion that the search effectiveness and intensity of the long-term unemployed could be improved upon. The (long-term) unemployed are interviewed⁴⁷ every six

⁴⁷ See Disney et al. (1992), especially pp. 200-206.

months on their job-search effort. In this manner the 'Restart Program' was supposed to motivate the long-term unemployed and assist them with their search effort. However, the interviews also gave the Employment Service new information on the characteristics of the unemployment benefit claimant. Thereby, giving the authorities the opportunity to discover fraudulent activities, assessing the claimant's true work-availability, and directing unemployment benefit claimants to more appropriate benefits in case of health problems. As Disney and Carruth state:

"...It is apparent, therefore, that Restart has been more successful in weeding out 'inappropriate' benefit claimants than through its employment counselling aspect..."⁴⁸

As the character of the effects caused by the 'Restart Program' may be ambiguous, its impact on the pattern of British long-term unemployment is clear. As can be seen, see table 8 and figure 6.A., the upward trend in long-term unemployment in Great Britain has been reversed. In paragraph 5.4.2. we will return to this point.

Given all of this, we can state that the patterns of the long-term unemployment ratio and aggregate unemployment in Great Britain and the Netherlands have been reasonably similar until the end of the eighties. Note, that it is to be expected that after the initial rise in aggregate unemployment the long-term unemployment ratio will fall; only if those 'newly' unemployed remain in the unemployment stock for at least a year, will the long-term unemployment ratio increase. The level of Dutch aggregate unemployment (see table 4.A.) rose dramatically in

⁴⁸ See Disney and Carruth (1992), p. 20.

1981\1982, whereas the Dutch long-term unemployment ratio rose sharply in 1982\1983 (see table 8.). Aggregate unemployment in Britain increased sharply in 1981, and consequently British long-term unemployment rose significantly only in 1982. Thus, there seems to be a lag of around one year between the rise in aggregate unemployment and the rise in the long-term unemployment ratio.

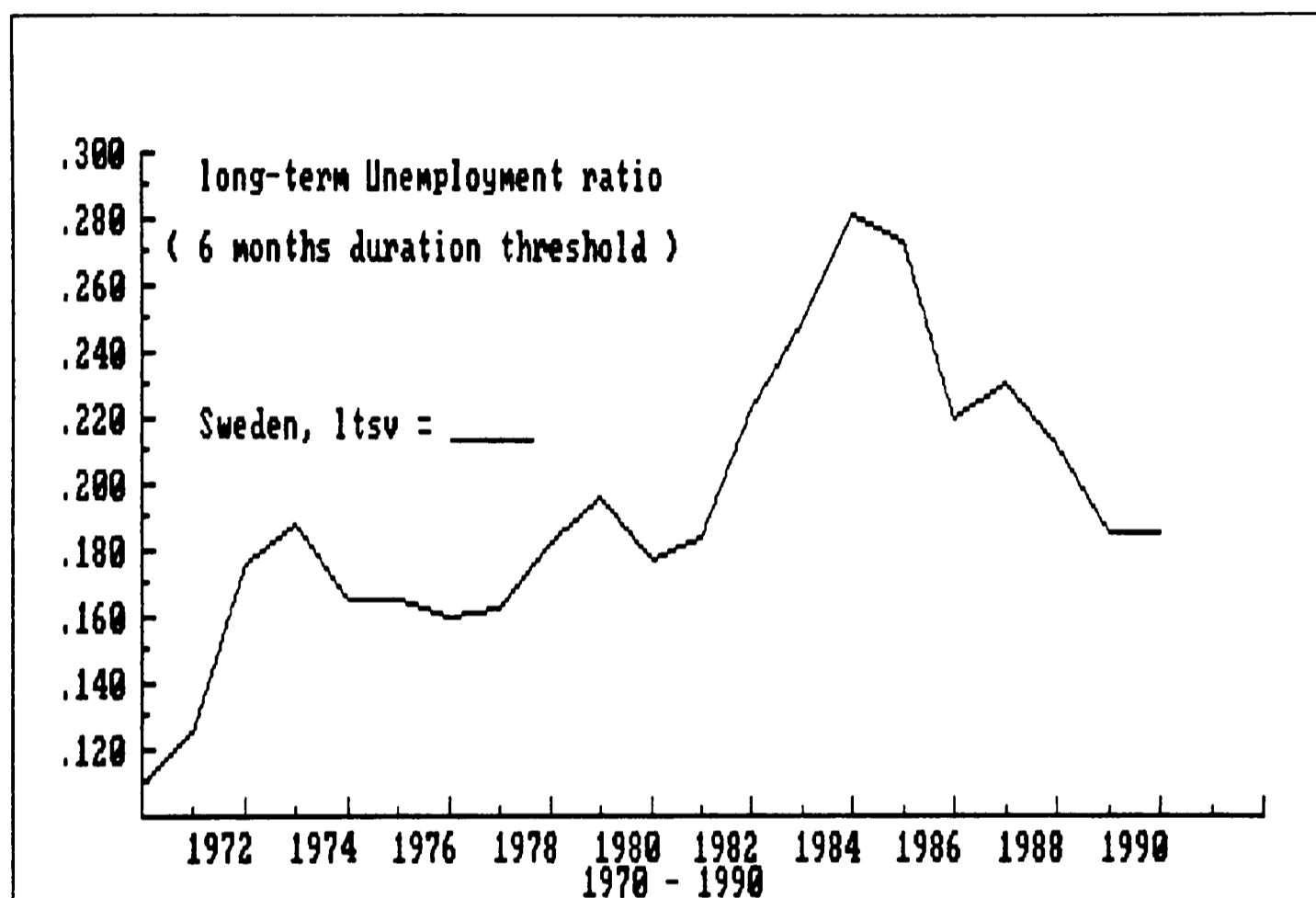


figure 6.B. The Swedish Long-term Unemployment Ratio.

The Swedish experience as regards the size of the share of long-term unemployment in aggregate unemployment (see table 8. and figure 6.B.) is different from the depicted Dutch and British patterns. When we look at the data, we see that the Swedish long-term unemployment ratio (lt_{sv}) has been reasonably stable throughout the seventies up to 1982. Swedish long-term unemployment figures rose considerably in 1982 (Swedish aggregate unemployment started to rise in 1981), reaching its peak in 1984. Thereafter, the Swedish long-term unemployment ratio

table 10. Characteristics of Long-Term Unemployment (1).

Long-term unemployment by age as a percentage of total long-term unemployment.

Year	< 25 years			25-44 years			44 years and older.		
	NL	SV	GB	NL	SV	GB	NL	SV	GB
1981	28.6	15.6	24.4	53.6	23.4	34.7	17.8	60.9	40.9
1982	32.9	13.9	25.8	54.5	27.0	37.1	12.6	59.1	37.1
1983	29.2	11.0	25.8	54.2	30.3	39.4	16.6	58.7	31.5
1984	28.4	6.5	28.6	55.7	26.0	39.8	15.8	67.5	31.6
1985	28.0	3.5	26.4	61.5	19.0	41.1	10.4	77.5	32.5
1986	24.9	7.4	23.8	63.4	22.3	42.6	11.7	70.2	33.6

Long-term unemployment by sex as a percentage of total long-term unemployment.

Year	Males			Females		
	NL	SV	GB	NL	SV	GB
1981	65.6	57.8	78.2	34.5	42.2	21.8
1982	69.3	55.7	79.2	30.7	44.3	20.8
1983	70.5	54.8	79.3	29.5	45.2	20.7
1984	70.1	52.1	77.4	29.9	47.9	22.6
1985	67.5	50.0	76.6	32.5	50.0	23.4
1986	66.4	41.5	75.9	33.6	58.5	24.1

Notes on table 10.

Ad.(1) Source: Eurostat (1988), 'Long-term Unemployment', p. 133, and p. 136. These are annual data.

has been declining gradually to its level of the seventies.

Relative to the Dutch and British long-term unemployment patterns, the changes in volume of the share of long-term unemployment in Sweden are insignificant. This observation is even more apparent if we take into account that the

duration threshold regarding long-term unemployment is only six months. The OECD publishes figures on the long-term unemployment ratio of several countries which are based on small sample sizes⁴⁹. Therefore, these data should be interpreted cautiously, but they can serve as another indicator of the long-term unemployment feature in the three countries concerned. For instance, for 1986 the OECD data suggest that the long-term unemployment ratios of the Netherlands are 0.595 (twelve months duration threshold) and 0.759 (six months duration threshold). For the United Kingdom, the long-term unemployment ratios are 0.450 (twelve months duration threshold) and 0.631 (six months duration threshold), whereas in Sweden these ratios are 0.081 (twelve months) and 0.219 (six months). These figures clearly indicate that in comparison to the Netherlands and Great Britain, Sweden does not suffer too much from a long-term unemployment problem. Note, the extremely low value of the twelve months duration threshold for the Swedish long-term unemployment ratio.

Some characteristics of long-term unemployment are depicted in table 10⁵⁰. As we can see, some striking differences exist in the composition of the long-term unemployment stocks in the three countries concerned. Most of the Swedish long-term unemployed are above forty four years of age. This percentage is higher in comparison with Great Britain and much higher in comparison with the Netherlands. This is not that surprising if we realise that the Dutch have a generous disability scheme. This institution will be discussed at great length in the following

⁴⁹ See OECD (1987), p. 217.

⁵⁰ For a detailed description of long-term unemployment in the countries of the European Community, see Eurostat (1988). Also, see OECD (1988).

chapter. The young Dutch and British persons seem to suffer the same degree of long-term unemployment, whereas the Swedish figures are much lower. (Some aspects of the rather effective Swedish labour market policies, including special programs for the younger unemployed, will be discussed in the next chapter.) The main group of Dutch long-term unemployed is prime aged workers. Furthermore, the males are the most dominant in British long-term unemployment. In contrast, females are in the majority as regards the Swedish long-term unemployment stock, which is not that surprising if we recall the impressively high Swedish female participation rates.

All in all, given the empirical evidence presented so far, it is arguable, especially as far as it concerns the Netherlands and Great Britain, that the long-term unemployment ratio, as an indicator of the overall search effectiveness of the unemployed, will be more useful in explaining patterns of unemployment than the mismatch indices, discussed in the previous section.

4. Particular Social Welfare Institutions.

4.0. Introduction.

In this chapter we will outline the features of some particular institutional arrangements which have had their impact on the labour market developments, as described in the previous chapter.

Institutional arrangements can have an impact on the *Beveridge curve*. These institutional arrangements can reflect the impact of the social security system as a whole, not simply that of the unemployment benefit level and the replacement ratio. The arrangements as regards the organization of the social security system vary from country to country. In section 4.1. we will discuss, very briefly, some data reflecting the economic importance of the dissimilar social security systems in the three countries concerned. However, it must be stressed that the main point of our study is not to discuss at great length the 'ins and outs' of the social welfare system as it is organised in the Netherlands, Sweden and the United kingdom¹. We will focus on those social welfare arrangements which can affect the *Beveridge curve* in an "unorthodox" way.

Therefore, in section 4.2., we will discuss the development of the Dutch disability insurance system. We will give a description of this system and keep our

¹ For a useful, but not too detailed overview of the social security arrangements in the member states of the European Communities, see Commission of the European Communities (1989).

eyes focused on the hidden unemployment component among those enlisted on this disability scheme. In section 4.3. we will turn our attention to the (in some ways) even more extensive Swedish social welfare system. We will discuss the quite unique Swedish labour market programs, in the context of disguising unemployment. Also, the Swedish disability program will be highlighted. In section 4.4. we will briefly discuss some aspects of the British social security system which seems to have a relatively (in comparison with the Netherlands and Sweden) small impact on its economy. We will, however, focus on the problems regarding the British disability regulations which have appeared during the eighties.

In section 4.5. the patterns of disability in the Netherlands, Sweden and the United Kingdom will be compared with each other². Some tentative conclusions will be drawn on the effects of the disability schemes on the three different economies.

² For a survey of arrangements regarding health and social legislation in Europe, see WHO (1990), especially the chapters on the Netherlands, Sweden and the United Kingdom.

4.1. Social Welfare Systems: Some Indicators.

In this section we will discuss, very briefly, some indicators of the economic significance of social security systems in the Netherlands, Sweden and the United Kingdom³. Again, it is not germane to our story to depict all the details regarding the various institutional arrangements. However, we do need an indication of the differences in size, impact upon economic life etc., before we can proceed to highlight particular institutional arrangements, the existence of which can influence the *Beveridge curve* of the countries concerned.

As we can see in table 11., the significance in financial terms of the government in modern Western European economies is beyond the slightest doubt. However, the manner in which the various governments spend their money is rather different. Both Sweden and, over the whole sample period to a slightly lesser extent, the Netherlands, reserve a very large role for the government in their respective economies. Most recently, around sixty percent of GDP was spent on government outlays in the Netherlands and Sweden. For the United Kingdom this percentage was significantly lower, about forty percent. As we can see in the three columns of block A in table 11., the percentage of GDP spent on social security transfers is highest in the Netherlands. About twenty five percent of Dutch GDP is

³ In the previous chapters we have focused on Great Britain rather than the United Kingdom. We have excluded Northern Ireland from our analysis because it is a region with, to use an euphemism, very typical problems. However, most data which is used for international comparisons, as in OECD publications, are regarding the United Kingdom, not Great Britain.

table 11. Government Expenditure and Social Security Transfers.

Year	Outlays of government as a percentage of GDP (1).			Social security transfers as a percentage of GDP (2).			Social security transfers as a percentage of total government outlays (3).		
	<u>A</u>	<u>B</u>	<u>C</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>A</u>	<u>B</u>	<u>C</u>
	NL	SV	UK	NL	SV	UK	NL	SV	UK
1960	33.7	31.1	32.6		8.0	6.8		25.7	20.9
1970	43.9	43.3	38.8						
1975	52.8	48.9	46.4	24.1	14.2	9.9	45.6	29.0	21.3
1980	57.5	61.6	44.8	25.9	17.6	11.7	45.0	28.6	26.1
1985	59.7	64.7	46.1	26.1	18.2	14.0	43.7	28.1	30.4
1986	59.6	63.0	45.1	25.9	18.4	14.0	43.5	29.2	31.0
1987	60.8	59.2	43.0	26.5	18.7	13.3	43.6	31.6	30.9
1988	58.3	59.5	41.1	25.9	19.5	12.2	44.4	32.8	29.7
1989	56.0	60.1	40.9	25.3	19.5	11.9	45.2	32.5	29.1

Notes on table 11.

- Ad.(1) Total outlays consists mainly of final consumption expenditures, interest on the public debt, subsidies, social security transfers to households, gross capital formation and purchases of land intangible assets. Source: 'Employment Outlook', the Organisation for Economic Co-operation and Development (OECD), July 1982, June 1990 and July 1991, OECD, Paris.
- Ad.(2) Social security transfers consist of social security benefits for sickness, old age, family allowances etc., social assistance grants and unfunded employee welfare benefits paid by general government. Source: OECD, 'Economic Outlook: Historical Statistics', the Organisation for Economic Co-operation and Development (OECD), 1986, 1990 and 1991, OECD, Paris.
- Ad.(3) (2)/(1).

spent on social security transfers. Although these transfer payments will keep up aggregate demand for goods and services, the huge financial costs associated with

them are a troublesome feature of the Dutch economy.

When we look at the ratio of money spent on social security transfers and total government outlays, see block C table 11., we can see again that the Netherlands has the highest proportion. About forty four percent of total government spending is used for social security transfers. The United Kingdom and Sweden are more or less in the same league with a ratio of around thirty percent. The United Kingdom, see block B table 11., has the lowest percentage of government money spent on social security transfers relative to GDP, *i.e.* around twelve percent.

In all countries the total government outlays and the amount spent on social security transfers has increased over the sample period to reach its peak during the mid-eighties. The various Western European governments have realized that this development had to be stopped and seem to have managed to curb the growth of government spending in general, and on social security transfers in particular. In this context the impact of the Thatcher government is probably most visible. The Swedish and especially Dutch coalition (consensus) governments have found it more difficult to cut spending.

In this context another point should be noted. Over the years the Dutch norms, as regards government spending and moreover government debts, must have changed dramatically⁴. In 1970 the Gross government debt as a percentage of national income ('national debt') was 51%, in 1980 this figure was 46%, whereas in 1990 the number had risen to 81%. The Swedish 'national debt' has steadily increased too: in 1970 31%, in 1980 45% and in 1990 50%. In sharp contrast

⁴ For a highly illuminating and readable elaboration of the state of affairs as regards Dutch government spending and the Dutch national debt, see de Kam, de Haan and Sterks (1990).

stands the British experience. In 1970 the 'national debt' was 86% which was reduced to 55% in 1980 and 36% in 1990⁵.

The figures in table 11. clearly indicate that the government is more of a big business in the Netherlands and Sweden than in the United Kingdom. At the same time, Sweden and the United Kingdom are comparable as regards the spending on social security transfers as a percentage of government spending, which plays a big role in Dutch government spending. These are crucial observations when comparing the three countries. Apparently, the Dutch and the Swedes want their government to play a distributive role in their society, arguably due to a more 'solidaristic'⁶ approach towards organizing their society.

However, the Swedes are spending their government money in a different, probably more efficient, way than the Dutch. Their emphasis is not just on income support and/or income distribution⁷, but on a further role of government. In Sweden there is more extensive involvement of government in the workings of the labour market than anywhere else in Western Europe. The Swedes can expect their government to help them to find a job or, in certain cases, actually provide one. As we can see in table 12. (a more detailed description of Swedish labour market policies will be given in paragraph 4.3.1), the Swedish government spends much more money on labour market measures⁸ than the British and Dutch governments

⁵ See de Kam, de Haan and Sterks (1990), p. 78.

⁶ The English language does not seem to have an adjective corresponding to the word solidarity.

⁷ See Björklund (1990b).

⁸ For a lengthy description of the labour market policies in various countries, see OECD (1990b), and OECD (1991a).

table 12. Public Expenditure on Labour Market Programs (1).

Program (2)	Year (3) Country	'85-'86	'86-'87	'87-'88	'88-'89	'89-'90	'90-'91
PESA	NL	.08	.08	.07	.08	.08	.08
	SV	.25	.26	.23	.21	.21	.21
	GB	.14	.16	.16	.14	.14	.14
LMT	NL	.19	.21	.21	.22	.22	.19
	SV	.50	.51	.55	.54	.44	.47
	GB	.09	.10	.10	.16	.24	.12
YM	NL	.04	.05	.05	.06	.07	.06
	SV	.21	.17	.12	.08	.05	.05
	GB	.25	.26	.25	.24	.22	.18
ES	NL	.06	.09	.06	.04	.05	.05
	SV	.43	.32	.23	.19	.13	.13
	GB	.22	.31	.30	.18	.03	.02
MD	NL	.72	.71	.70	.69	.66	.62
	SV	.72	.76	.76	.75	.73	.72
	GB	.03	.03	.03	.03	.02	.03
UC	NL	3.24	2.99	2.84	2.69	1.42	2.30
	SV	.75	.77	.70	.58	.55	.59
	GB	2.01	1.93	1.56	1.10	.84	.90
ERLM	NL	.00	.00	.00	.00	.00	.00
	SV	.12	.11	.11	.10	.09	.08
	GB	.05	.03	.02	.01	.00	.00
LMM	NL	1.09	1.12	1.10	1.10	1.08	1.04
	SV	2.11	2.01	1.88	1.77	1.56	1.58
	GB	.72	.85	.84	.75	.66	.59
IM	NL	3.24	2.99	2.84	2.69	2.42	2.30
	SV	.87	.88	.81	.68	.64	.67
	GB	2.06	1.95	1.58	1.11	.84	.90
Total	NL	4.33	4.11	3.94	3.80	3.50	3.34
	SV	2.97	2.89	2.69	2.45	2.20	2.25
	GB	2.79	2.80	2.41	1.86	1.50	1.49

Notes on table 12.

- Ad.(1) All the public expenditure figures are give as a percentage of GDP. Source: OECD (1991), 'Employment Outlook', July, OECD, Paris, pp. 244 and 247-248.
- Ad.(2) Explanation of the used abbreviations: PESA, public employment services and administration; LMT, labour market training; YM, youth measures; ES, subsidised employment; MD, measures for the disabled; UC, unemployment compensation; ERLM, early retirement for labour market reasons; LMM, labour market measures ($LMM = PESA + LMT + YM + ES + MD$), and IM, income maintenance ($IM = UC + ERLM$).
- AD.(3) The figures for the Netherlands are regarding the year first mentioned, so 1985 for '85-'86, 1986 for '86-'87, etc.
-

(although the Dutch seem to have become more and more convinced of the values of an active, *i.e.* financing of programs on training, schooling, work-experience, etc, rather than a passive, *i.e.* transfer of benefits, role of government⁹). A close look at table 12. tells us that the Dutch government spends, by far the most on unemployment transfers. This is due to a large number of unemployment benefit claimants, a relatively long duration of the unemployment benefit¹⁰ and a fairly high unemployment benefit level¹¹ (also, see table 13.). With exception of the work and training programs for the disabled¹², the Dutch performance over the sample

⁹ See section 3.4. on Dutch measures aimed at the long-term unemployed. Also, for an international comparison of the Dutch effort as regards active labour market policies, see Ministerie van Sociale Zaken en Werkgelegenheid (1990a), p. 80.

¹⁰ See OECD (1991a), pp. 227-231.

¹¹ For a comparison of unemployment benefit levels for prime aged unemployed workers, see OECD (1991a), p. 201. Also, see Layard, Nickell and Jackman (1991), pp. 514-516. For an indication of the difficulties encountered when comparing unemployment benefit systems of different countries, see Atkinson and Micklewright (1991), especially pp. 1688-1697.

¹² The Dutch spend a considerable amount of money on these 'Sociale Werkplaatsen'. See Ministerie van Sociale Zaken en Werkgelegenheid (1990a), pp. 74-81.

period, as far as it concerns labour market measures, is relatively poor.

As regards the labour market measures, the main focus of British government policies has been on measures concerning youth unemployment¹³. Also, most of the beneficiaries of the 'Community Program', which was aimed at all long-term unemployment persons, were younger than 25 years of age (we refer to section 3.4.). Spending on the employment service as such (PESA) is considerable¹⁴, but the amount spent on other labour market measures is relatively small.

The Swedes prefer to spend their money on various labour market programs, especially training and subsidies for employers to employ a special category of unemployed labourers, *e.g.* the long-term unemployed or the disabled. One of the effects is that the Swedes have to spend less on unemployment compensation. This is not because their unemployment benefit is low (depending on eligibility for the different benefits the short-term unemployment replacement rate can be as high as ninety percent¹⁵) but because of a low level of aggregate unemployment (see table 4.A and table 4.B.).

In table 12.B. we present some indicative data on replacement ratios in the various countries. As we can see, the Dutch replacement ratio reached its highest level in 1976, but the Dutch (especially the government and the unions) have since then realized that it is hard to sustain such a benefit level. Therefore, it is not surprising that π_{nl} has decreased substantially since the mid-seventies. The

¹³ Also, see Standing (1986).

¹⁴ The lowest number of unemployed persons per employment service staff member has Sweden (nine). Regarding the Netherlands and the United Kingdom these figures are forty two and thirty six, respectively. See OECD (1991a). p. 213.

¹⁵ See OECD (1991a), p. 201.

Swedish replacement ratio is an weighted average of private (union) insurance benefits, and state support benefits. The former being of a higher level than the latter. Also, see the notes on table 13., Ad.(2). In contrast to rr_{nl} and rr_{gb} , the Swedish replacement ratio has been increasing steadily during the sample period. The comparison of the three replacement ratios is not completely correct, if only for the fact that the duration of benefits in Sweden is shorter than in the other two countries. Furthermore, unemployed do get offered employment of some sort. Therefore, it may be more 'sound' to incorporate the income of those on a training program or government job scheme. The British replacement ratio is remarkably stable over the years. Only, since the mid-eighties has rr_{gb} been falling. This could very well be due to a tougher attitude of the authorities towards the unemployed. We also refer to our discussion of British policies as regards the long-term unemployed in section 3.4..

All in all, Sweden is the only country in the sample where spending on unemployment benefits as a percentage of GDP is lower than on labour market programs.

However, in the event that a Swedish labourer becomes unemployed, he or she can claim an unemployment benefit at a more than acceptable financial level. The Swedes will claim this benefit more or less as their natural right. But, at the same time, the unemployed Swedes face severe penalties when they do not accept a training place or job offer; the unemployment benefit can no longer be claimed after such a rejection.

In the Netherlands benefits are looked upon as a right in the same manner, but a sense of obligation and acceptance of penalties in case of dereliction

table 13. Replacement Ratio Patterns.

Year	$rr_{nl}(1)$	$rr_{sv}(2)$	$rr_{gb}(3)$
1961	.66		
1962	.62		
1963	.66		
1964	.62		
1965	.66		
1966	.53		.22
1967	.75	.17	.23
1968	.70	.19	.23
1969	.73	.20	.22
1970	.85	.24	.24
1971	.75	.21	.21
1972	.82	.21	.22
1973	.86	.20	.22
1974	.88	.30	.22
1975	.95	.24	.24
1976	.98	.24	.23
1977	.91	.28	.24
1978	.88	.30	.24
1979	.92	.31	.23
1980	.87	.31	.22
1981	.84	.32	.22
1982	.85	.33	.23
1983	.78	.38	.23
1984	.74	.39	.23
1985	.67	.39	.23
1986	.65	.40	.21
1987	.62	.43	.20
1988		.45	.19
1989			.18
1990			.18

Notes on table 13.

Ad.(1) rr_{nl} : Dutch replacement ratio. Source: Muysken and van Schaik (1989), 'Een Nieuwe Kijk op Structuurwerkloosheid', Research Memorandum, Universiteit van Brabant, Tilburg, as cited by van Ours (1991), 'The

Efficiency of the Dutch Labour Market in Matching Unemployment and Vacancies', *De Economist*, p. 375.

- Ad.(2) rr_{sv} : Swedish replacement ratio. rr_{sv} is an average benefit coverage weighted replacement ratio. $rr_{sv} = \alpha_1 rrs_{sv} + \alpha_2 rrf_{sv}$. Where, α_1 : denotes the share of the unemployed receiving state benefits ('KAS-benefits'), rrs_{sv} represents the replacement ratio for state benefits, α_2 : denotes the share of the unemployed receiving fund benefits and rrf_{sv} represents the replacement ratio for fund benefits. Source: data-tape kindly provided by Outi Aarnio, Worcester College, University of Oxford.
- Ad.(3) rr_{gb} : British replacement ratio. As regards the period before 1970, the DSS only publishes data on the average earnings in comparison to benefit income when sick or unemployed. The trend in those data has been used to compute rr_{gb} for the period up to 1970. The presented data refer to single males. The relative benefit income level for married couples with children is higher. However, the trend in those series is approximately the same as regards the presented series. Source: for the years 1966-1970 Department of Social Security, 'Social Security Statistics 1974' p. 212. and Social Security Statistics 1990' p. 297, for the years 1970-1990.
-

is a different matter. The Dutch appreciate their freedom, they expect the government to help when in financial problems, but it should not tell them what to do in any other case¹⁶. So far, the Dutch authorities have not enforced laws or measures comparable to Swedish practice. The price tag associated with this attitude is immense. It is dawning upon the Dutch¹⁷ that something has to be done if they want to preserve their social welfare system, simply because the financial burden is becoming too big. The Dutch economy is paying too big a price for its vast pool of unused (hidden or not) labour capacity.

¹⁶ For a rather entertaining description of the Dutch characteristics, as seen by a foreigner, see Duke de Baena (1968).

¹⁷ The debate in the Netherlands on the costs of their social security system, especially the disability scheme, seems to be without end. It is virtually impossible to give a complete list of readings on the topic. We can only refer to the various articles in journals, periodicals and newspapers which are cited in the list of references.

4.2. Particular Aspects of the Dutch Social Welfare System.

4.2.1. The Disability Insurance System.

As we have seen, in section 2.5., hidden unemployment among those enlisted on particular social security schemes, can have an effect on the position of the *Beveridge curve*. The Netherlands is a country where institutional arrangements play an important role in (economic) life. Moreover, the existence of a hidden unemployment component among the stock of beneficiaries of particular social security schemes justifies a brief outline of the Dutch social security system¹⁸. Thereafter, we will focus on the empirical evidence as regards labour "unsuitability" and its hidden unemployment component.

In the Netherlands a distinction is made between social insurance programs and welfare provisions. The importance of this distinction lies in both funding and management. Welfare provisions are financed out of general revenue, the management of the funds is taken care of by the state. Among the social security schemes administered in this manner are the 'Algemene Oudersdomswet' (AOW), pensioners, the 'Algemene Bijstandswet' (ABW), provision of welfare

¹⁸ There are several publications which contain lengthy descriptions of the Dutch social security system. Given that the abuse of the Dutch labour unsuitability acts is the main topic of discussion, we refer to a recent publication on this topic: Aarts and de Jong (1990), especially chapters 1,2 and 5. Another useful reference (in English) as regards the Dutch disability and sickness provisions is: OECD (1991b), especially pp. 57-71 and pp. 106-111.

benefits at the social minimum level and the 'Rijkswerkloosheidswet' (RWW), unemployment benefit.

On the other hand there are the social insurance programs financed out of mandatory contributions levied on employers and employees. The existence of these mandatory contributions, 'premies', contributes to the substantial size of the wedge: *i.e.* the difference between gross wages as paid by the employers and the wage rate as received by employees. The management of funds is taken care of by organizations formed by unions and employers. The schemes apply to the private sector. Examples are: the 'Werkloosheidswet' (WW), unemployment benefit, the 'Ziekte-wet' (ZW), sickness and the 'Wet Arbeidsongeschiktheid' (WAO), labour unsuitability act (disability).

In case of unemployment one can apply for money out of the WW if one was previously in private sector employment. Eligibility depends on the fact that the unemployed person is available for a job and that he\she was discharged against his\her will. Basically, in the Netherlands, one can lay off workers if the job has become redundant. In the context of the growth of the number of beneficiaries of the AAW\WAO scheme, it is crucial to note that dismissals are not easily achieved. In the Netherlands the director of a local employment office (arbeidsbureau) has to approve of a dismissal. This process is likely to be a time consuming, thus costly, affair.

After entrance in the unemployment stock one can enjoy the WW benefit for six months. If one is still unemployed after this period one can apply for a benefit out of the 'Wet Werkloosheidsvoorziening' (WWV), yet another unemployment benefit. Duration of this benefit depends on the age of the beneficiary, but the

maximum is two years. If still unemployed after this period one turns to the RWW, which, as pointed out above, is a welfare provision financed out of general funds. The RWW is applicable to every single unemployed resident of the Netherlands.

In 1986 a reform of the Dutch social security system took place¹⁹, with the introduction of several supplementary benefits to the unemployment and disability benefits²⁰. Moreover, the unemployment insurance act (WW) has been revised, now incorporating the WWV. The level of the unemployment benefit has remained the same. The minimum duration of the unemployment benefit is half a year. Duration of the unemployment benefit increases with the number of years of prior employment. With a work history of more than forty years the unemployment benefit can be extended to five years²¹. Furthermore, the RWW has remained intact.

Turning to the disability schemes, it is worth looking at the act as regards sickness. Private sector employees who due to sickness or injury, are not able to do their job can apply for sick pay ('ziekengeld'), ZW benefit. In practice, due to settlements between employers' organizations and unions, they will receive their normal wage, although the law²² only entitles them to seventy percent of their

¹⁹ See 'Invoeringswet Stelselherziening Sociale Zekerheid' (Act regarding the Implementation of the Social Security System Reform) enacted 6 November 1986.

²⁰ See the discussion with respect to the Dutch labour unsuitability Acts below. Also, see the 'Toeslagenwet' (TW), Supplements Act.

²¹ See 'Werkloosheidswet' (WW), Unemployment Act, art. 42-1 and art. 42-2.

²² See 'Ziektewet' (ZW), Sickness Act, art. 29-1. This Act also stipulates, art. 29-3., that employers do not have to pay sick pay for the first two days of illness. Again, due to settlements between employers and unions, in practice sick pay is being paid from the first day onwards. In order to decrease the days on sick leave, there have been recurrent plans to introduce a legal barrier against these practices, so far without

current wage (until 1985 this was eighty percent). Most of the sickness spells do not last very long and only two percent of the spells last for a whole year. One year is also the period of eligibility duration.

As stated before, the WAO only captures the 'disabled' who were previously employed in the private sector. The civil servants²³ are covered by the disability arrangements as provided by the 'Algemeen Burgelijk Pensioenfonds' (ABP). The ABP deals with claimants in an analogous way as the WAO assessors, with one important exception, the ABP decides positively on a disability application only when it has become certain that the disability has a permanent character. So in contrast with the WAO, in case of application for disability funds by civil servants, there is no one year period between the first day of sickness and the admission to the disability pension.

It is noteworthy that the disability frequency, *i.e.* the number of admissions to the scheme as a percentage of the total number of insured persons, was higher for the private sector than for the civil servants²⁴. This is in part explained by the fact that, in general, the time which elapses before a civil servant is granted a disability pension is longer than for private sector employees. Another crucial distinction is that the government, unlike private sector employers, is not guided by the principle of profit maximisation. Hence, there is no incentive for the government to lay off workers who have become less productive. From the employers' perspec-

success.

²³ The military servants are covered by the 'Wet Arbeidsongeschiktheidsvoorziening Militairen', the General Military Disability Pensions Act.

²⁴ See van den Bosch and Petersen (1980), p. 54.

tive, the marginal revenue of labour should at least equal the marginal cost of labour. If not, they will look for ways to get rid of the labourer, and, with the rigid Dutch employment laws, the WAO has been found to be a convenient alternative. This is not to say that there is no hidden unemployment component among the disabled civil servants, but it is highly likely that this component is lower than among those enlisted on the WAO²⁵ (see the discussion in paragraph 4.2.2.). For both the government as an employer and the civil servant as an employee there seems to be less incentive to apply for a disability pension. The above, will hold for the period before the eighties. However, since the Dutch government has started to try and curb its total expenditures - because of striking budget deficits - it is not inconceivable that the government started to look upon the disability scheme as a possible outlet for unwanted civil servants. Note, that, in principle, civil servants cannot be dismissed by the Dutch government. However, data to investigate this interesting issue are, unfortunately, not available.

After a period of twelve months former private sector employees can apply for benefits out of the, 'Algemene Arbeidsongeschiktheidswet\Wet Arbeidsongeschiktheid' (AAW\WAO), the labour unsuitability act. Until 1975 only the WAO was enacted. In the Netherlands, up to the reform of 1987, the law defined a disabled person as: he\she who as a consequence of illness or injury, fully or partly, is unable to earn - with labour which is commensurate (suitable) to his force and capabilities and which with respect to his\her training and work history, he\she can reasonably be asked to perform at the place where he works or at a similar place - what physically and mentally healthy persons in otherwise similar circumstances

²⁵ See van den Bosch and Petersen (1980), p. 56.

usually earn²⁶. According to this, disability does not only depend on mental or physical health but upon, among other things, education, work experience and moreover previous income as well. (This is a very broad concept of disability, even in comparison with Sweden.) Note, the size of the benefit depends on the loss of earnings. The AAW, law since 11 December 1976, covers all residents. The size of the AAW benefit also depends on the severity of disability. A person classified as disable for eighty up to hundred percent, will receive payment up to eighty percent of the social minimum. For previously privately employed persons supplements are available on basis of WAO regulations, whereas the former civil servants will, when eligible, receive supplements out of ABP funds. Note, that the AAW also covers, the self-employed, the congenital handicapped and those who have been handicapped since early childhood.

As stated before, the WAO is a social insurance scheme. Management of WAO funds is done by representatives of employers and employees, as institutionalized in the 'bedrijfsverenigingen'. These have a high degree of autonomy, as do the employees of the 'Gemeenschappelijke Medische Dienst' (GMD), the medical service. The 'bedrijfsverenigingen' are supervised by the social insurance council ('Sociale Verzekeringsraad'). This council can advise the minister van Sociale Zaken en Werkgelegenheid (the Dutch employment secretary), but it should be noted that in the end the employment secretary has the right to determine on his own the percentage of mandatory obligations paid by employers and employees.

With respect to the applications to the WAO it has to be noted that these

²⁶ See Emanuel, Halberstadt and Petersen (1984), as cited by Aarts and de Jong (1990), p.26.

have to be judged by the 'Gemeenschappelijke Medische Dienst' (GMD). The assessments of disability by medical personnel and their consequences as far as it concerns labour suitability is a process which involves value judgements, tastes and the like. It is extremely difficult to come to an opinion regarding the degree of labour (un)suitability. Administrative leniency is most probably one of the major reasons for the increase in the number of beneficiaries on the AAW\WAO scheme²⁷. Moreover, the whole assessment procedure can be a formality. The medical service simply cannot judge all applications. One of the consequences of the disability definition as described above is that assessments have to reflect the earning capabilities of the applicant²⁸. Also, while the assessment is being made the availability of a commensurate job is taken into account.

An employer might discriminate against a disabled job-applicant, as he does against the long-term unemployed. Hence, job-opportunities are low due, at least partly, to disability. It is clearly impossible to establish to what extent that is the case. The disability assessment is thus influenced by the labour market opportunities of the applicant. In practice this meant that it was assumed, by the disability assessors, that the poor labour market opportunities of the applicant were caused by discrimination by employers. To put it bluntly: labour unsuitability was caused by unemployment. Those to whom this applies can be considered as unemployed,

²⁷ See Aarts and de Jong (1990), p. 43. The sociale verzekeringsraad is far from happy with the criticism it, and the medical service which is involved in the implementation of the AAW\WAO scheme, have to endure. See NRC Handelsblad (1991c), p. 10.

²⁸ The minimal degree of disability in order to be accepted on the WAO scheme used to be fifteen percent. This explains the relative ease with which employees, especially older workers, could be enlisted on the disability programm. See van den Bosch and Petersen (1980), p. 53.

the 'unmeasured unemployed'.

The enactment of the WAO took place on the eighteenth of February 1966. Initially, it was meant to be a temporary provision and it was the objective of the scheme to enable the beneficiaries to get back into employment. However, as has been stated above, the labour unsuitability definition was open to a wide interpretation. Moreover, the mentality (ethics) of both employees and employers has changed. The times during which the calvinist mentality depicted the general Dutch state of mind are long gone. For labourers this means that it is no longer 'not cricket', if that expression can be used in any Dutch context, to live off the state. On the other hand, the employers who had difficulties with the strictly applied laws regarding dismissals (legal employment protection), considered the WAO an easy way to get rid of redundant or less productive workers. Also, there is no reason to believe that the general state of Dutch health has decreased dramatically during the last two decades. The impact of the deteriorating economic situation and the increase in the number of people enlisted on the WAO scheme is also reflected by an increase in the number of people admitted to the WAO scheme whose applications were based on rather vaguely described causes of disability²⁹, e.g. back complaints and psychological complaints³⁰. With these facts in mind one can imagine why the number of AAW\WAO beneficiaries has risen so dramatically (see table 14.).

What are the financial advantages for employees of the AAW\WAO

²⁹ See Roodenburg and Wong Meeuw Hing (1985).

³⁰ In 1989 approximately thirty percent of the total number of new cases of disability was caused by psychological complaints. Only four percent was caused by accidents. See Ministerie van Sociale Zaken en Werkgelegenheid (1991), p. 41.

scheme over the Dutch unemployment benefit system? The duration of wage related benefits is only up to a maximum of thirty months, whereafter there is only eligibility for the RWW, the welfare provision benefit. Those on the AAW\WAO scheme who are entitled to full disabled benefits get eighty percent of the last earnings and the duration is indefinite, *i.e.* until one is 65 years of age. So, it is vastly preferable from the workers' viewpoint to be enlisted on the AAW\WAO scheme rather than being long-term unemployed with a RWW benefit. Furthermore, an AAW\WAO benefit might be socially more acceptable than an unemployment benefit. The Dutch have made it too attractive to be disabled.

In general, the Dutch policy regarding disabled pensioners is more concerned with the guarantee of their income than endorsing reparticipation in the labour force of disabled workers. It is therefore not surprising that in 1989 there were twice as many disabled pensioners per thousand members of the labour force in the Netherlands as in Sweden³¹.

Some features of the AAW\WAO scheme are depicted in table 14. Referring to columns (1) and (7) of table 14., we can see that the total number of beneficiaries of the AAW\WAO scheme (WB) has increased over the years to approximately 900 000, which is an enormous number of people. This number is much higher than the Dutch aggregate unemployment figures (see table 1. and table 4.A.). Note, that the Dutch labour force consists of only six million people, and the total population of the Netherlands is only fifteen million. Given these facts there can be no doubt about the significance of the AAW\WAO scheme for Dutch economic life.

³¹ See Burkhauser (1991).

As has been pointed out, entry into the AAW\WAO scheme from the labour force has been relatively easy over the years. This is depicted by the increase in the seventies, see table 14., column (3), in the number of newly accepted applicants to the AAW\WAO scheme (NWB). Until 1975 we can observe only a gradual increase in the inflow of new beneficiaries. In 1976 the flow into the AAW\WAO stock was massive, without doubt due to the enactment of the AAW. Consequently, the numbers in the AAW\WAO scheme also contained the disabled who were self-employed and other categories (the disabled since childhood make up about nine percent of the total number of beneficiaries³²). After 1976, the inflow has been around 100 000 persons a year.

When looking at table 14., columns (4),(5),(6),(7) and (8), we can see that the flow out of the AAW\WAO stock (EWB), before 1976 the WAO stock, is considerably smaller than the inflow. Furthermore, it is clear that the number of people leaving the AAW\WAO scheme due to recovery (ERWB) is relatively small. Also, the exit pattern of the AAW\WAO scheme beneficiaries due to recovery (ERWB) has been reasonably stable during the eighties. The share of outflow due to recovery in the total flow out of the AAW\WAO stock (RTR) is about thirty percent. This indicates that most people leave the AAW\WAO stock because of retirement (from this perspective one can regard the AAW\WAO scheme as an early retirement scheme). Throughout the eighties the net recovery inflow (NRIW) has been at a high level of around 75 000 persons per year. It is altogether easy to imagine that quite a few beneficiaries of the AAW\WAO scheme do not want to leave the scheme at all and consequently have a very low search

³² See Centraal Bureau voor de Statistiek (1990), p. 104.

intensity. It is highly likely that those enlisted on the AAW\WAO scheme whose 'disability' was caused by unemployment do have a lower than average search intensity. Also, for reasons pointed out in the paragraph on long-term unemployment, see section 1.4., in addition to the health-history of persons, employers will be rather choosy about these job-applicants. Given that the labour market in the eighties was characterized by an excess supply of labour, it is easily understood why the exit probability from the AAW\WAO stock was very low.

The growth of the real costs of the AAW\WAO scheme was caused by an increase, in the seventies, in the value of the benefit and an upsurge in the number of beneficiaries³³. A good indicator of the financial significance of the AAW\WAO scheme to the Dutch economy is the amount of money spent on benefits as a percentage of GNP (tabr). As we can see (table 14., column (2)), spending rose to four and a half percent of GNP in 1983. Although down to three and a half percent of GNP, the real costs of the AAW\WAO scheme are still immense. Note, these figures only reflect the amount paid on benefits claimed because of the disability act, in 1988 this was about 15.8 billion guilders. The total amount paid on social security benefits concerning disability, including 'redemption money', in 1988 was approximately 25.0 billion guilders, about six and a half percent of GNP³⁴. So, the figures shown in table 14. are a conservative estimate of the real costs of the Dutch disability scheme. Moreover, these figures do not take account of the costs incurred by the Dutch economy whilst not using the productive labour component hidden in the AAW\WAO stock.

³³ See van den Bosch and Petersen (1983).

³⁴ See Centraal Bureau voor de Statistiek (1990), p. 105.

table 14. The Netherlands: Labour Unsuitability Patterns.

Year	WB(1)	tabr(2)	WBW(3)	NWB(4)
1969			194 000	
1970		1.27	215 365	49 719
1971		1.47	237 138	51 895
1972		1.67	260 765	54 231
1973		1.83	286 893	56 741
1974		2.07	312 734	60 846
1975 (*)		<u>2.42</u>	348 800	<u>73 100</u>
1976	474 600	2.70	383 000	167 200
1977	531 100	3.28	432 000	108 300
1978	581 900	3.73	461 000	108 200
1979	621 600	3.91	486 000	104 500
1980	660 300	4.08	508 000	106 300
1981	688 300	4.18	523 000	101 300
1982	710 900	4.33	535 000	93 600
1983	730 900	4.41	545 000	90 000
1984	750 500	4.26	557 000	88 700
1985	767 000	4.01	563 000	91 200
1986	783 000	3.94	571 000	86 800
1987	793 000	3.63	579 500	92 000
1988	813 900	3.53	591 700	99 900
1989	846 400		610 700	
1990	882 000		625 000	

Notes on table 14.

- Ad.(*) Break in the series due to the enactment of the AAW, see text.
- Ad.(1) WB: total number of beneficiaries of the AAW\WAO scheme (at 31 December of the year in question). Source: Statistical Yearbook, Centraal Bureau voor de Statistiek (CBS; Netherlands Central Bureau of Statistics), 1979, 1982, 1985, 1988, 1990 and 1991.
- Ad.(2) tabr: total amount of benefits as percentage of GNP at market prices. Source: see (1) and Nationale Rekeningen 1989, Centraal Bureau voor de Statistiek, 's-Gravenhage, SDU uitgeverij, 1990.
- Ad.(3) WBW: total number of beneficiaries of the AAW\WAO scheme who were previously employed in the private sector. Source: Aarts and de Jong (1990), 'Economic Aspects of Disability Behaviour', Doctoral Thesis, Erasmus Universiteit Rotterdam, p. 39. Also, Statistical

table 14. (continued).

Year	EWB(5)	ERWB(6)	NIWB(7)	NRIWB(8)	RTR(9)
1969		7 372			
1970	28 289	7 107	21 430	42 612	.25
1971	30 122	7 826	21 773	44 069	.26
1972	30 482	8 084	23 749	46 147	.27
1973	31 350	9 468	25 391	47 273	.30
1974	35 005	9 382	25 841	51 464	.27
1975 (*)	<u>37 100</u>	<u>11 162</u>	<u>36 000</u>	<u>61 938</u>	<u>.30</u>
1976	41 400	16 611	125 800	150 598	.40
1977	51 800	18 057	56 500	90 243	.35
1978	58 900	22 122	49 300	86 078	.38
1979	64 800	24 864	39 700	79 636	.38
1980	67 700	27 733	38 600	78 567	.41
1981	73 400	27 532	27 900	73 768	.41
1982	71 000	25 592	22 600	68 008	.36
1983	69 500	23 389	20 500	66 611	.34
1984	69 100	20 264	19 600	68 436	.29
1985	74 700	21 476	16 500	69 724	.29
1986	70 700	18 792	16 100	68 008	.27
1987	73 800	19 825	18 200	72 175	.27
1988	78 100	18 720	21 800	81 180	.31

Notes on table 14. (continued).

Yearbook, CBS, 1976, 1979, 1990 and 1991.

- Ad.(4) NWB: total number of new beneficiaries of the AAW\WAO scheme.
Source: see Ad.(1).
- Ad.(5) EWB: total number of beneficiaries leaving the AAW\WAO scheme.
Source: see (1).
- Ad.(6) ERWB: total number of beneficiaries leaving the AAW\WAO scheme through recovery. Source: own computations based on data presented in column (1) and 'termination data' as in Aarts and de Jong (1990), 'Economic Aspects of Disability Behaviour', Doctoral Thesis, Erasmus Universiteit Rotterdam, p. 39.
- Ad.(7) NIWB: net inflow of beneficiaries of the AAW\WAO scheme, (4)-(5).
- Ad.(8) NRIWB: net recovery inflow of beneficiaries of the AAW\WAO scheme, (4)-(6).
- Ad.(9) RTR: recovery termination ratio, (6)/(5). The share of outflow due to recovery in the total flow out of the AAW\WAO stock.

As stated above, public debate focused, and continues to do so, on the effectiveness of the AAW\WAO scheme. As a result, in 1987 a system reform took place whose target was to return to the original aim of the scheme, *i.e.* an insurance system for the 'real' medically disabled. Due to this reform the labour market connection is gone³⁵. Since the implementation of the reform, the labour market opportunities of the applicant should no longer be taken into account whilst assessing the degree of labour unsuitability. Hence, the partially disabled who cannot find work, are no longer eligible to full AAW\WAO benefits but can apply for a financially less attractive WW benefit in addition to their AAW\WAO benefit.

The Dutch government has given criteria which determine which jobs should be regarded as appropriate for disabled workers. Also, the government has made a law in order to encourage employers to be more flexible w.r.t. the limitations of disabled workers. The Dutch government, in this legal framework (WAGW)³⁶, has also created the opportunity to enforce upon employers an employment quota regarding disabled workers³⁷. The government, as an employer, only just satisfies the legal three percent criterion. In the private sector the situation is worse. The practical introduction of an employment quota for the disabled, was not welcomed by either employers' organizations or unions. As a

³⁵ The definition regarding labour unsuitability which is 'in force' at the moment is: Disabled is he\she who as a consequence of illness or injury, is unable to earn, with respect to his\her training and work history, what physically and mentally healthy persons in otherwise similar circumstances usually earn. See the 'Wet op de Arbeidsongeschiktheid' (WAO), Labour Unsuitability Act, art. 18-1 and the 'Algemene Arbeidsongeschiktheidswet' (AAW), General Labour Unsuitability Act, art. 5-1.

³⁶ 'Wet Arbeid Gehandicapte Werknemers' (WAGW), Disabled Employees Labour Act, enacted 16 May 1986.

³⁷ See Wet Arbeid Gehandicapte Werknemers (WAGW), art. 3.

consequence, the Dutch employment secretary has yet to apply his legal powers³⁸. Hence, it is doubtful whether the application of quota is going to be the way in which the people enlisted on the AAW\WAO scheme are helped back into the labour force.

The 1987 disability system reform has not had the desired effect; the number of disabled people continues to grow³⁹ (also, see table 14.) and so, does the cost of the program. Therefore, two points arise: a) Why did the reform fail? and b) What are the Dutch going to do about the costs of the program?. As regards the first question we will start with a quotation of an apparently somewhat cynical Dutch economist with predictive powers (he made this statement as early as 1981):

"...the institutions which manage some of the social security arrangements, they really should be 'cleaned out'. This is not expected to happen in the near future. As regards the AAW\WAO a policy aimed at the reduction of numbers should be implemented. This is another way of saying that the physicians ought to assess the applications more carefully. Very well, but who controls the physicians?..."⁴⁰

As stated before, administrative leniency (by the managers, *i.e.* 'bedrijfsverenigingen' and the employees of the medical service involved (GMD), is one of

³⁸ See *Intermediair* (1990), p. 66.

³⁹ Inflow numbers for the years 1989 and 1990 are not available. The CBS has decided to stop publishing these inflow data. However, data as regards the inflow in the stock of disabled previously employed in the private sector suggest that the inflow therein in 1989 is 2.7 times the inflow in 1984. See *Intermediair* (1990), p. 63. This may serve as additional evidence for the fact that the disability system reform has not had the desired effect (see text below).

⁴⁰ Prof. J. Pen as cited by Aarts and de Jong (1992), p. 204. The translation is the responsibility of the author.

the most important reasons for the increase in the number of beneficiaries on the AAW\WAO scheme. However, the removal of the labour market connection from the Dutch statutebook was expected to decrease the inflow into the AAW\WAO scheme. In particular, the number of applicants being declared as completely disabled was expected to decline. The bad chances on a job were not to lead to disability anymore, thus these applicants were expected to get a partial disability benefit, *e.g.* 50 %, where the other half would be paid through unemployment benefit with lower rates. In that manner costs would be reduced. Although the reform somewhat diminished the autonomy of the 'bedrijfsverenigingen', there still appears enough room for manoeuvre. The lack of financial (budget) incentives does not increase the effectiveness of the 'bedrijfsverenigingen'. Apparently, its employees have their own interpretation of the law.

Additionally, the assessors, physicians and other employees of the Gemeenschappelijke Medische Dienst (GMD), still interpret the rules in their own manner⁴¹. Particularly, the physicians responsible for disability assessment have great difficulty with applying the new legal requirements towards older applicants and applicants with psychological complaints, *i.e.* more than half the number of new applicants⁴². The physicians still tend to assess many cases as fully disabled rather than declaring partial disability. Also, the employees of the GMD tend to avoid conflicts with the clients (disability applicants) through generous interpretation of the law⁴³. Again, the lack of incentives to do otherwise and the absence of strict

⁴¹ See van der Veen (1990).

⁴² See Sprenger (1990).

⁴³ See Aarts and de Jong (1992), pp. 204-205.

supervision, give them the room to proceed with this behaviour.

Summarizing, tighter control (strict supervision, clear rules and budgetincentives) on the disability assessors appears to be the way by which a reduction of the number of beneficiaries of the AAW\WAO scheme could be accomplished⁴⁴.

As stated before the cost of the AAW\WAO scheme is very high.

Therefore, the Dutch cabinet has recently announced plans to curb its expenditure on the sickness and disability schemes⁴⁵. The main points of the initially proposed additional reforms which were supposed to be implemented in 1992, were: there would no longer be a sickness benefit for the first six weeks of illness, the employer would have been legally required to pay the employee 70 percent of the gross wage during this period. The length of eligibility for a WAO benefit (or supplement to the AAW benefit) would have been restricted to a maximum of six years (depending on the age of the disabled person). Afterwards, the disabled beneficiary will only receive an AAW benefit which equals 70 percent of the minimum wage. All in all, these measures are an attempt to curb government expenditure on disability by cutting the duration of the benefit rather than its level.

There seems to be widespread consensus in the Netherlands on the necessity of bringing down the number of disabled pensioners and the massive costs of the scheme. Unfortunately, this is the only point everybody agrees upon⁴⁶.

⁴⁴ See Aarts and de Jong (1992).

⁴⁵ See, among others, NRC Handelsblad (1991a), p. 1, and De Volkskrant (1991), p. 1.

⁴⁶ For a chronological survey (July 1986 - August 1991) regarding the main government proposals, reactions, counterproposals and the like by unions and employers' organizations, see Trouw (1991), p. 13. Also, see Elsevier (1991a), pp. 9-12.

The employers, as organized in the 'Verbond van Nederlandse Ondernemingen' (VNO) and the 'Nederlands Christelijk Werkgeversverbond' (NCW) seem to be quite content with the initially proposed reforms. We should not forget that the same employers were quite willing to dispose of less productive labourers via the AAW\WAO scheme in order to avoid the consequences of the rigid Dutch employment laws. On the other hand the unions, the 'Federatie Nederlandse Vakbeweging' (FNV) and the 'Christelijk Nationaal Vakverbond' (CNV), are vehemently against the proposals. The proposed reforms do indeed make it more difficult for employees to apply for funds out of the social welfare scheme. The unions want to keep duration and level of the disability benefit unaltered and suggest that the government should use its legal powers in the context of the WAGW forcing employers to employ disabled persons up to five percent of their workforce. The Dutch employment secretary has not used these legal powers so far. Furthermore, the proposals caused some uproar in the ranks of the social democrats⁴⁷, one of the political parties in the Dutch coalition cabinet. As a consequence, the party chairperson resigned, and the collapse of the Dutch coalition government was only narrowly avoided. After all this political turmoil, the outcome was a compromise package of measures. This compromise not only concerns the disability scheme but the link between the minimum wage and the general benefit level as well. One of the main features of the new plan is that it will mainly affect younger disabled. The cabinet decided⁴⁸ that disabled who are over fifty years of age should not be

⁴⁷ For instance, see NRC Handelsblad (1991b), p. 1. Also, Rotterdams Dagblad (1991a), p. 1, and (1991c), p. 3.

⁴⁸ See Rotterdams Dagblad (1991b), p. 3.

affected by the plans. It seems that the AAW\WAO scheme has turned out to be a politically accepted early retirement scheme.

As regards early retirement, it is important to note that in the Netherlands the various early retirement schemes have been widely used. This has led to an outflow of experienced workers out of the labour force with its downward short-run effect on the unemployment rate. However, it is also a rather expensive business. The loss of qualified labourers and the cost of early retirement have led to a debate in the Netherlands on the desirability of the various early retirement schemes⁴⁹. The number of persons using early retirement arrangements increased from nineteen thousand in 1984 to thirty nine thousand in 1989⁵⁰. These numbers do not include the arrangements for military servants and people working in education. The latter was around fifty five thousand persons in 1990⁵¹. As a result of the huge costs, the existence of these schemes, certainly in their present form, is in danger and it is likely that the number of people leaving the Dutch labour market through the early retirement channel in a few years time could be very small indeed.

It is however surprising to observe that the debate so far has not focused on the real problem. How will the Dutch go about solving the problem of decreasing labour market opportunities for so many labourers who are either unemployed or hidden unemployed? The increase in cost of the AAW\WAO scheme is only a symptom of the disease.

⁴⁹ For instance, see NRC Handelsblad (1991d), p. 1 and (1991e) p. 10, and Elsevier (1991b) pp. 41-44.

⁵⁰ See Centraal Bureau voor de Statistiek (1986), p. 352, and Centraal Bureau voor de Statistiek (1991), p 89.

⁵¹ See, Elsevier (1991b), p. 43.

Whether the proposed additional reforms will bring about the desired result, *i.e.* curbing the costs of and the inflow of new beneficiaries into the AAW\WAO scheme remains very much to be seen. Nevertheless, it has become very clear to the Dutch, public and politicians alike, that something needs to be done about their social security system. It will be in accordance with the Dutch sense of moral justice that those who are out of work because of injury should have the right to claim a reasonable income. However, the Dutch will have to reorganize their institutions regarding the disability scheme if they want to fulfil that moral obligation. As stated above, tighter control of the disability assessors seems required. Implementation of that requires 'political will'. The will to interfere in an area which was autonomous (managed by employers and employees whose consent and cooperation is needed for a successful implementation of a stricter policy). In its present form the Dutch disability scheme seems hard to maintain.

4.2.2. Disability: the Hidden Unemployment Component.

The increase in beneficiaries of the AAW\WAO scheme, which to a certain extent was caused by the deterioration of the economic situation in the seventies, led to, among other things, a public debate regarding the amount of unemployment among the so-called disabled. The determination of the amount of unemployment among the disabled is not a problem which is easily solved. However, given the character of the Dutch system which classifies disabled into

eight degrees of severity as regards labour unsuitability, it is, although still difficult, worthwhile trying to estimate the unemployment (work-capacity) factor in the AAW\WAO stock.

As stated before, the labour market opportunities were taken into account while assessing the degree of labour unsuitability. This leads to all sorts of problems for the assessors. Since 1973, the scheme-administrators (managers) assumed that employers' choosiness caused the poor labour market opportunities. Result: partly disabled, *i.e.* those who are at least fifteen percent labour unsuitable, were regarded as fully disabled, with all the beneficial financial consequences for the applicant. It has to be stressed that this attitude of the disability assessors had no legal basis. In fact, against the original aim of the program, the AAW\WAO scheme became, at least in part, an unemployment benefit welfare program covering the loss of earnings due to the lack of employment.

Several studies have investigated the hidden unemployment component among those enlisted on the AAW\WAO scheme. Already in 1980 it was calculated that about forty percent of the AAW\WAO stock could be described as hidden unemployment⁵². This estimate was derived by comparing the disability incidence rates, *i.e.* the number of new beneficiaries as a percentage of the total number insured, of private sector employees and civil servants. Note, in sharp contrast to the disability assessment of former private sector employees, it is assumed that economic factors play no part in the application for a disability benefit of a civil servant. The difference in the patterns of disability of civil servants and private sector employees are thus explained by non-disability factors: work capacity or

⁵² See van den Bosch and Petersen (1980), p. 58.

hidden unemployment. Thus, for the period before 1980, estimates are available on the amount of hidden unemployment in the WAO stock⁵³.

In a recent study, Aarts and de Jong state that:

"...If indeed 53 to 71 percent of the 1980 cohort of DI-entrants (entrants to the AAW\WAO) were to regain full capacity to perform suitable work, while the percentage of benefit terminations due to recovery is only 20 percent, our conclusion is that 33 to 51 percent of the 1980 cohort do not leave the program while being expected to be capable of performing suitable work..."⁵⁴

Keeping in mind that what they describe as expected work capacity rapidly diminishes with age, it has to be noted that the amount of hidden unemployment among the young in the AAW\WAO stock is relatively small. This estimate of hidden unemployment is based on interviews and examinations of approximately 2 000 persons⁵⁵.

These estimates of the amount of unmeasured unemployed gives us the opportunity to look at the true Dutch unemployment pattern. The studies referred to above, despite using different techniques and being conducted at different times, come to the same conclusion. About forty percent of the AAW\WAO beneficiaries can be regarded as 'unmeasured unemployed'. This is, of course, a rough estimate and there is no reason to believe that this percentage should be constant over the years. The forty percent as estimated by cohort analysis will be used for the figures

⁵³ See van den Bosch and Petersen (1980), p. 57.

⁵⁴ See Aarts and de Jong (1990), p. 144.

⁵⁵ For a complete discussion of their method of estimating the amount of hidden unemployment in the AAW\WAO stock, see Aarts and de Jong (1990), pp. 136-149.

regarding the last decade. Note, we only use estimates available on data regarding the disabled who were previously employed in the private sector (WBW). There are no estimates available on the hidden unemployment component among the disabled self-employed (in 1988 approximately fifty thousand persons), and the disabled civil servants. Since the attempts of various Dutch governments to curb public expenditure effectively started in the beginning of the eighties (remember the Dutch government cannot lay off its workers), the number of disabled civil and military servants has more than doubled (the Dutch did not go to war) from about thirty eight thousand persons in 1980 to approximately eighty three thousand persons in 1988⁵⁶. It is therefore highly likely that there is a considerable hidden unemployment component among those disabled, this in contrast to the years before 1980 when the government did not have an incentive to use the disability scheme as an exit path from the labour force. It is impossible to estimate the size of this hidden unemployment component. Therefore, we shall use the figures regarding the previously private sector employed persons while exploring the nature of the true Dutch unemployment pattern. However, it is not impossible that these figures are a very modest estimate of the true size of the hidden unemployment component.

We can construct a hidden unemployment rate (uu_{nl}) and an unemployment rate (uw_{nl}) which takes the unmeasured unemployed into account. Also, we recall equation (25.). Consequently:

$$UU = q * WBW \quad (25.)$$

$$uu = UU/[UU+(U+E)] * 100 \quad (29.)$$

⁵⁶ See Centraal Bureau voor de Statistiek (1990), p. 104.

$$uw = [UU+U]/[UU+(U+E)] * 100 \quad (30.)$$

For the computation of both rates we have to add the 'unmeasured unemployed' to the Dutch labour force ($U+E_{nl}$). The patterns of the hidden unemployment rate and the adjusted Dutch unemployment rate are shown in table 15., columns (4) and (8). As we can see, the hidden unemployment rate has been rising almost continuously since 1969 up to 3.75 percent of the adjusted labour force. The pattern of the adjusted Dutch unemployment rate has been dominated by the pattern of the orthodox unemployment rate. In contrast to the hidden unemployment rate the adjusted unemployment rate has been decreasing since 1984, although not as much as the orthodox unemployment rate. These patterns are depicted in figure 7. as well. The level of the adjusted Dutch unemployment rate is very high. Despite the doubts we have about the reliability of the used unemployment figures for the end of the eighties (see section 3.1.1., especially table 1.) the high value of uw_{nl} indicates the seriousness of the Dutch unemployment problem.

As we have described above, the hidden unemployment rate (uu_{nl}) and the adjusted Dutch unemployment rate (uw_{nl}) have been computed while using a constant correction factor, *i.e.* .4, for the last decade. Obviously, this practice is not completely satisfactory, but further detailed data on the possible fluctuations of this correction factor are not available. Nevertheless, this should not deter us from some 'tentative inferences' regarding the value of the correction factor for the last decade. Thus, we should be extremely careful attaching any value to the data obtained in this manner. However, these series can be used later on to test for the sensitivity of our econometric results regarding the Dutch unmeasured unemployed to the

assumption of constancy of the correction factor (see chapter 5.). Therefore, In column (2) and (3) of table 15., we have presented two other correction factors, ucdf and ucsf. The first follows the pattern of unemployment. Thus, whenever u_{nl} is rising/declining so is ucdf. The adjusted unemployment rate computed while using ucdf, udw_{nl} , is depicted in column (9). The rationale behind this series is that there seems to be some evidence (see table 14.) that the inflow into the hidden unemployment component is correlated with unemployment. This reasoning seems rather intuitive and it holds for periods in which unemployment is rising. However, the increase in the number of people on the AAW\WAO scheme did not decrease when unemployment started falling after 1984. There seems not to be any lagged effect either. Therefore, we have constructed ucsf (and usw_{nl}), see columns (3) and (10) of table 15. This correction factor continues to rise even after the decline unemployment. For the results of our 'sensitivity and robustness' tests, we refer to chapter 5., but looking at table 15. makes it very clear to us that once we correct for the hidden unemployment component, the Dutch unemployment problem looks very severe indeed.

As has been shown in section 3.4., long-term unemployment is a significant feature of the Dutch labour market. Therefore, a comparison of the patterns of long-term unemployment and the hidden unemployment component in the AAW\WAO stock is suitable. As we can see while looking at figure 8. (in order to make comparison possible, the long-term unemployment ratio has been multiplied by a factor ten), the depicted trends are rather different from each other. The hidden unemployment rate has been rising slowly after its sharp increase in the mid-seventies. The long-term unemployment ratio had its biggest increase in the

table 15. Adjusted Dutch Unemployment Patterns.

Year	ucf(1)	ucdf(2)	ucsf(3)	uu _{nl} (4)	uudw _{nl} (5)	uusw _{nl} (6)
1969	.13	.13	.13	.53	.53	.53
1970	.19	.19	.19	.85	.85	.85
1971	.23	.23	.23	1.12	1.12	1.12
1972	.27	.27	.27	1.44	1.44	1.44
1973	.29	.29	.29	1.69	1.69	1.69
1974	.30	.30	.30	1.89	1.89	1.89
1975	.31	.31	.31	2.12	2.12	2.12
1976	.32	.32	.32	2.38	2.38	2.38
1977	.33	.33	.33	2.73	2.73	2.73
1978	.34	.34	.34	2.96	2.96	2.96
1979	.37	.37	.37	3.34	3.34	3.34
1980	.40	.39	.39	3.63	3.54	3.54
1981	.40	.41	.41	3.56	3.65	3.65
1982	.40	.43	.43	3.57	3.83	3.83
1983	.40	.45	.45	3.59	4.02	4.02
1984	.40	.45	.46	3.64	4.07	4.16
1985	.40	.43	.47	3.65	3.92	4.27
1986	.40	.425	.48	3.69	3.91	4.39
1987	.40	.42	.49	3.69	3.86	4.48
1988	.40	.415	.50	3.67	3.80	4.55
1989	.40	.41	.51	3.72	3.81	4.69
1990	.40	.40	.52	3.77	3.77	4.85

Notes on table 15.

- Ad.(1) Correction factor (see equation (25.): 'q') to calculate unmeasured unemployment rate (see below). Source: (see text) van den Bosch en Petersen (1980) and Aarts and de Jong (1990).
- Ad.(2) As in Ad.(1). However, it is assumed that the correction factor follows the unemployment pattern. Thus, it is rising until 1983-1984, whereafter it declines. The values are within the boundaries suggested by Aarts and de Jong.
- Ad.(3) As in Ad.(1). However, it is assumed that the correction factor keeps increasing rather than following the pattern of Dutch unemployment. The last observation is one percentage point above the upper limit suggested by Aarts and de Jong.

table 15. (continued).

Year	$u_{nl}(7)$	$uw_{nl}(8)$	$udw_{nl}(9)$	$usw_{nl}(10)$
1969	1.39	1.91	1.91	1.91
1970	1.24	2.08	2.08	2.08
1971	1.71	2.81	2.81	2.81
1972	2.96	4.36	4.36	4.36
1973	3.01	4.65	4.65	4.65
1974	3.67	5.50	5.50	5.50
1975	5.17	7.18	7.18	7.18
1976	5.51	7.76	7.76	7.76
1977	5.34	7.93	7.93	7.93
1978	5.31	8.12	8.12	8.12
1979	5.39	8.55	8.55	8.55
1980	6.02	9.43	9.43	9.43
1981	8.48	11.74	11.82	11.82
1982	11.34	14.51	14.74	14.74
1983	13.67	16.77	17.14	17.14
1984	13.92	17.05	17.43	17.50
1985	12.81	16.00	16.23	16.53
1986	11.90	15.15	15.35	15.77
1987	11.33	14.60	14.76	15.30
1988	10.99	14.26	14.37	15.04
1989	10.45	13.78	13.86	14.66
1990	9.60	13.01	13.01	13.99

Notes on table 15. (continued).

- Ad.(4) uu_{nl} : hidden unemployment rate. Note, this only reflects the hidden unemployment component among the disabled who were previously employed in the private sector (see equation (25.) and the text).
 $uu_{nl} = UU_{nl}/[UU_{nl}+(U+E_{nl})] * 100$, $UU = q * WBW$ ($q = ucf$).
- Ad.(5) As in Ad.(4). However, it is assumed that $q = ucdf$.
- Ad.(6) As in Ad.(4). However, it is assumed that $q = ucsf$.
- Ad.(7) u_{nl} : Dutch unemployment rate, see table 4.B., Ad.(1).
- Ad.(8) uw_{nl} : Dutch unemployment rate corrected for hidden unemployment.
 $uw_{nl} = [U_{nl}+UU_{nl}]/[UU_{nl}+(U+E_{nl})] * 100$.
- Ad.(9) udw_{nl} . As in Ad.(8). In this case, UU_{nl} is computed while using $ucdf$.
- Ad.(10) usw_{nl} . As in Ad.(8). In this case, UU_{nl} is computed while using $usdf$.

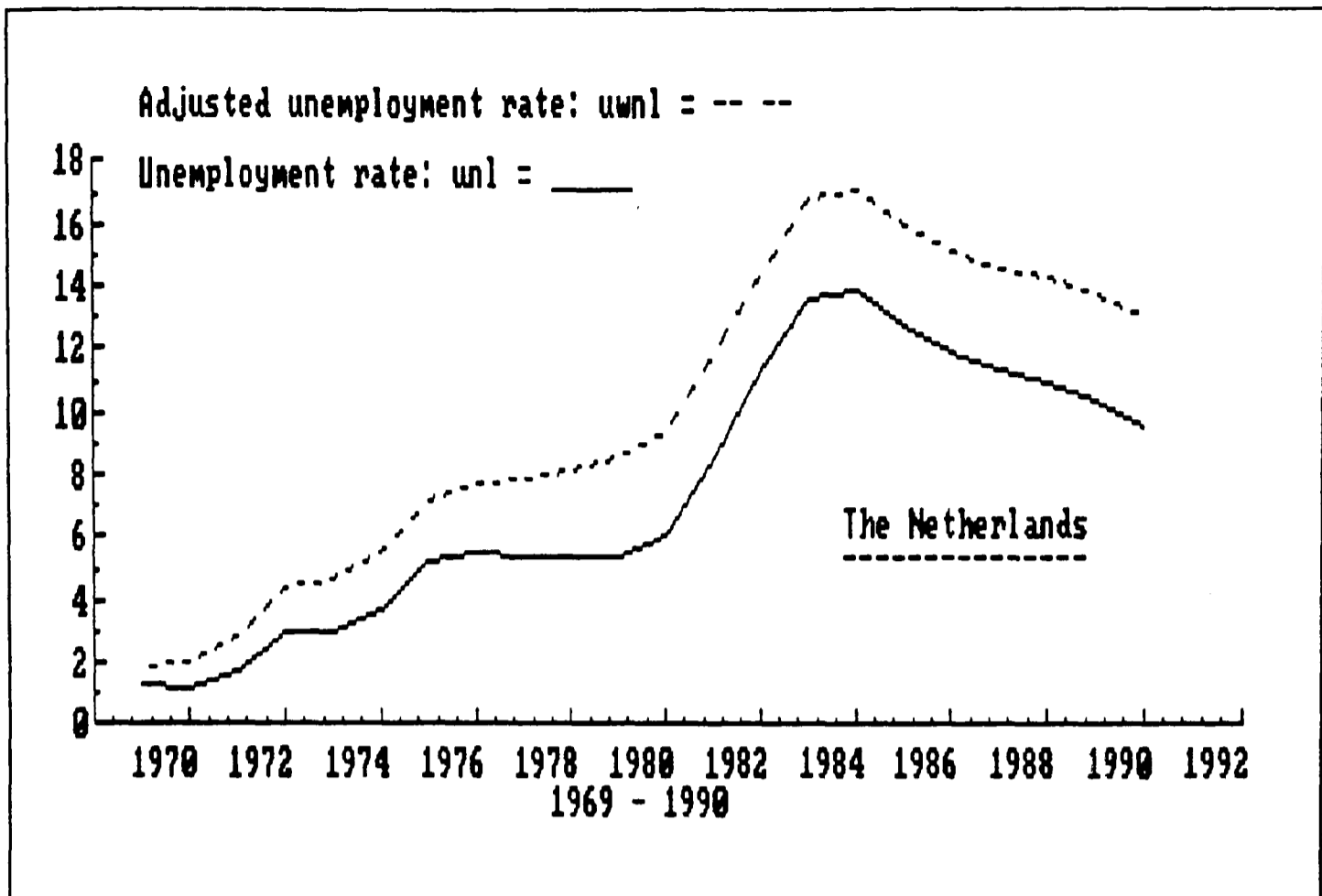


figure 7. Dutch (Adjusted) Unemployment Rates.

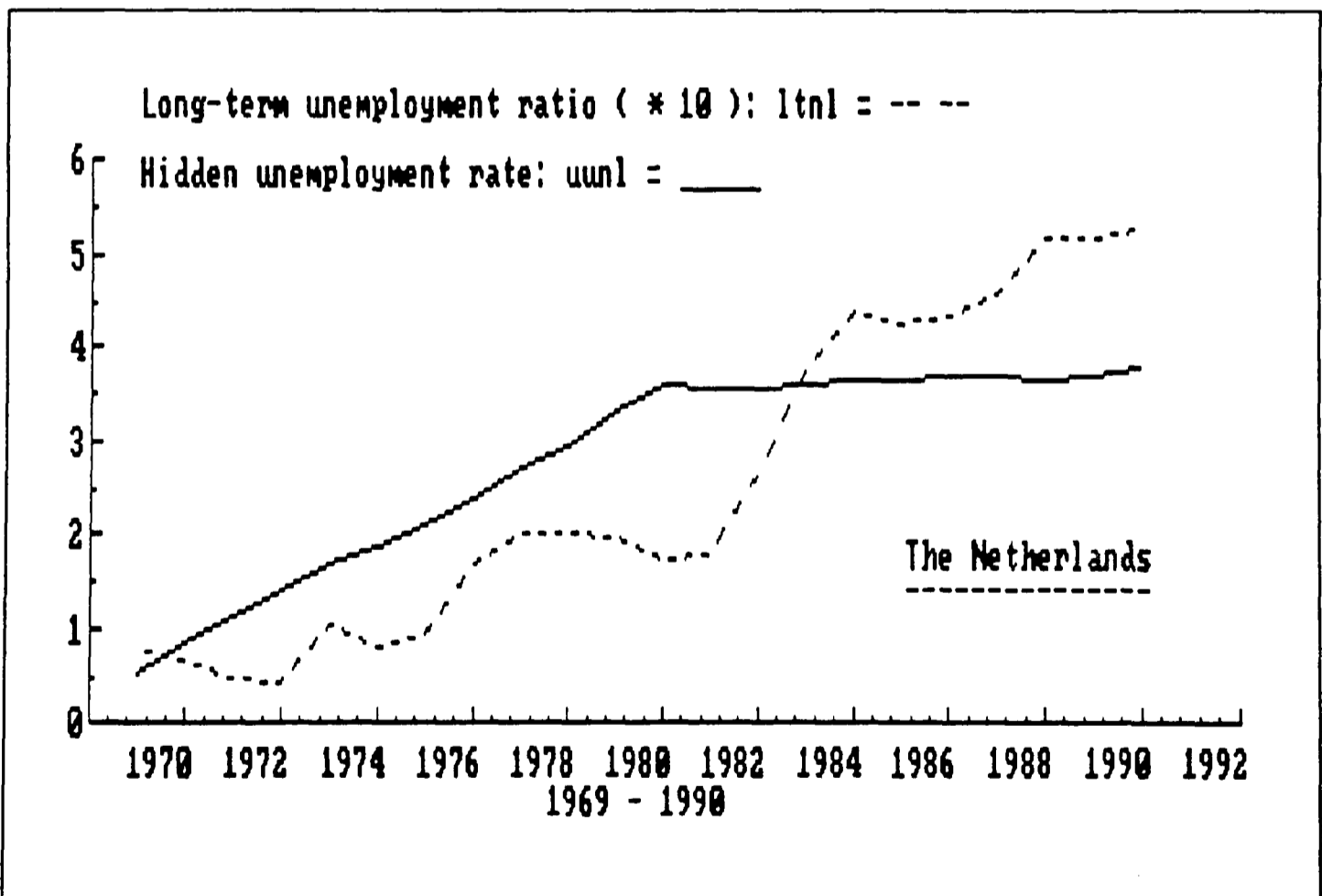


figure 8. Dutch Long-term Unemployment Ratio and Hidden Unemployment Rate.

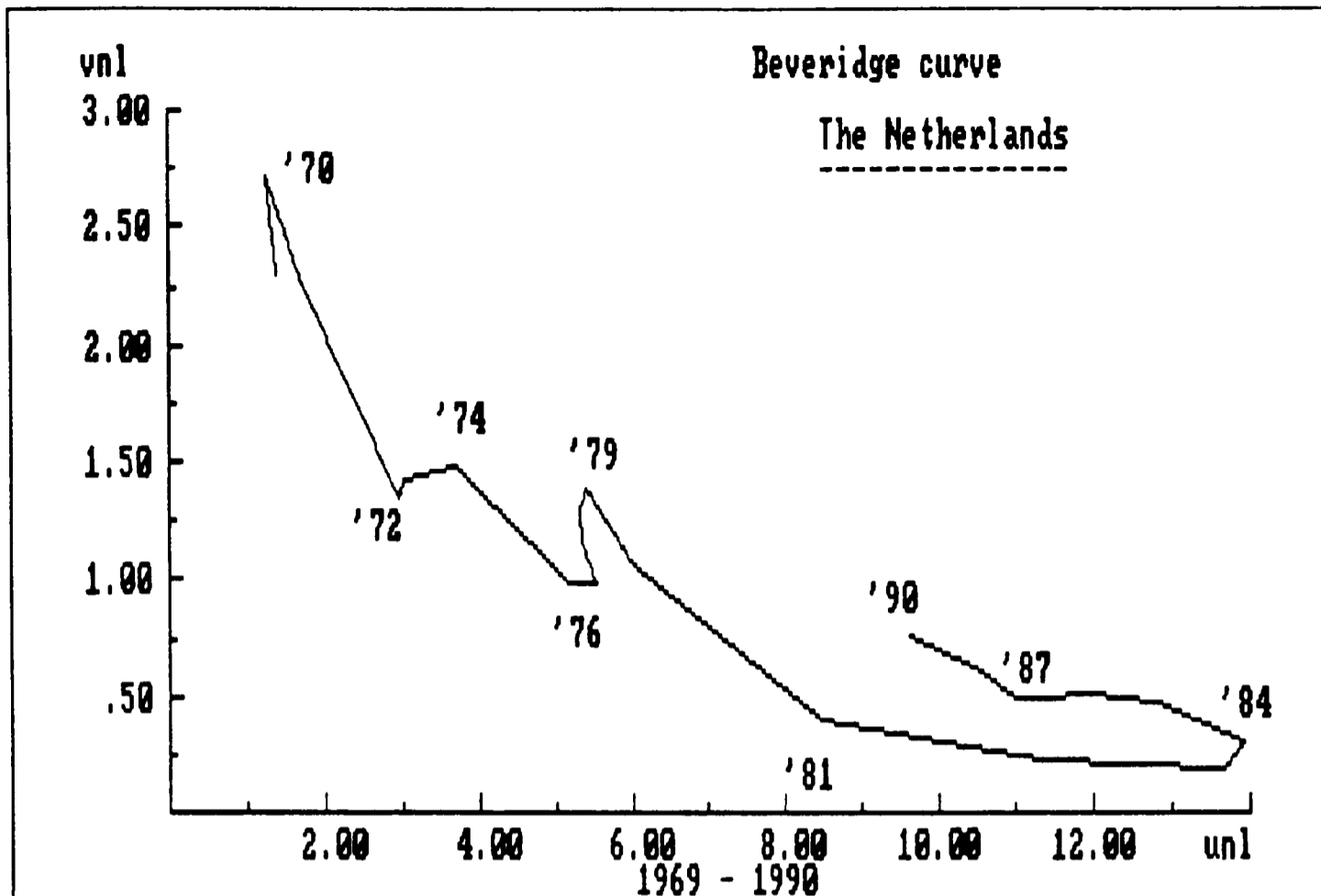


figure 9. The Dutch Beveridge Curve.

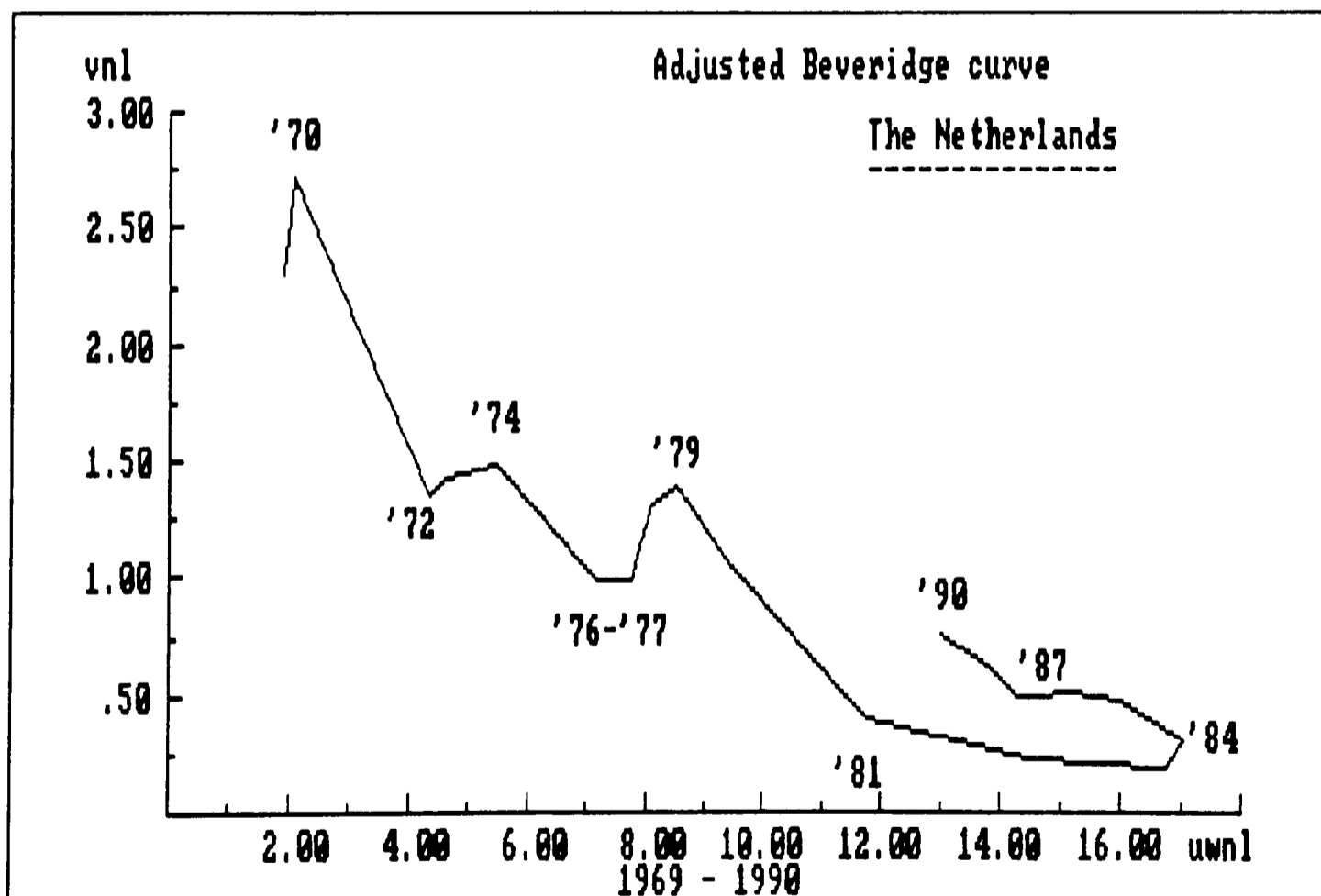


figure 10. The Adjusted Dutch Beveridge Curve.

beginning of the eighties and shows a much more volatile pattern than the hidden unemployment rate. The patterns of these two Dutch labour market features do not look very much alike.

In figures 9. and 10., we present for the years 1969-1990 the Dutch *Beveridge curve* (see figure 4.A.) and the Adjusted Dutch *Beveridge curve*, i.e. the relationship of v_{nl} and uw_{nl} . As we can see the graphs are rather similar. Note, the different scale on the x-axis.

As we have stated earlier on, the 'unmeasured unemployed' can be regarded as long-term unemployed. Remember that before entrance into the AAW\WAO scheme one has had to be a beneficiary of the sickness benefit act of which the eligibility duration is one year. Therefore, it is suitable to compute an adjusted long-term unemployment ratio, which could be regarded as a proxy for the search intensity and search effectiveness of all unemployed, including the 'unmeasured unemployed'. Consequently:

$$UULT = UU + LTU \quad (31.)$$

$$uult = UULT/(U+UU) \quad (32.)$$

Thus, the share of adjusted long-term unemployment (UULT) in adjusted aggregate unemployment (U+UU) is reflected by the adjusted long-term unemployment ratio (uult). As we can see (table 16. and figure 11.), this adjusted Dutch long-term unemployment ratio is at an impressively high level over the whole sample period (1969-1990). A value of around 65 percent, for 1990, is rather shocking. This describes in an accurate way the sever problems of the Dutch

table 16. Dutch Long-Term Unemployment Ratios (Unadjusted and Adjusted).

Year	lt _{nl} (1)	uult _{nl} (2)	Year	lt _{nl}	uult _{nl}
1969	.081	.337	1980	.175	.492
1970	.068	.450	1981	.177	.427
1971	.047	.427	1982	.267	.448
1972	.046	.361	1983	.375	.509
1973	.103	.429	1984	.438	.558
1974	.080	.397	1985	.425	.556
1975	.095	.362	1986	.433	.571
1976	.172	.426	1987	.456	.593
1977	.201	.477	1988	.520	.643
1978	.201	.493	1989	.518	.648
1979	.198	.511	1990	.529	.666

Notes on table 16.

Ad.(1) See table 8., Ad.(1).

Ad.(2) uult_{nl}: adjusted Dutch long-term unemployment ratio.

$$uult_{nl} = (UU_{nl} + LTU_{nl}) / (UU_{nl} + U_{nl}).$$

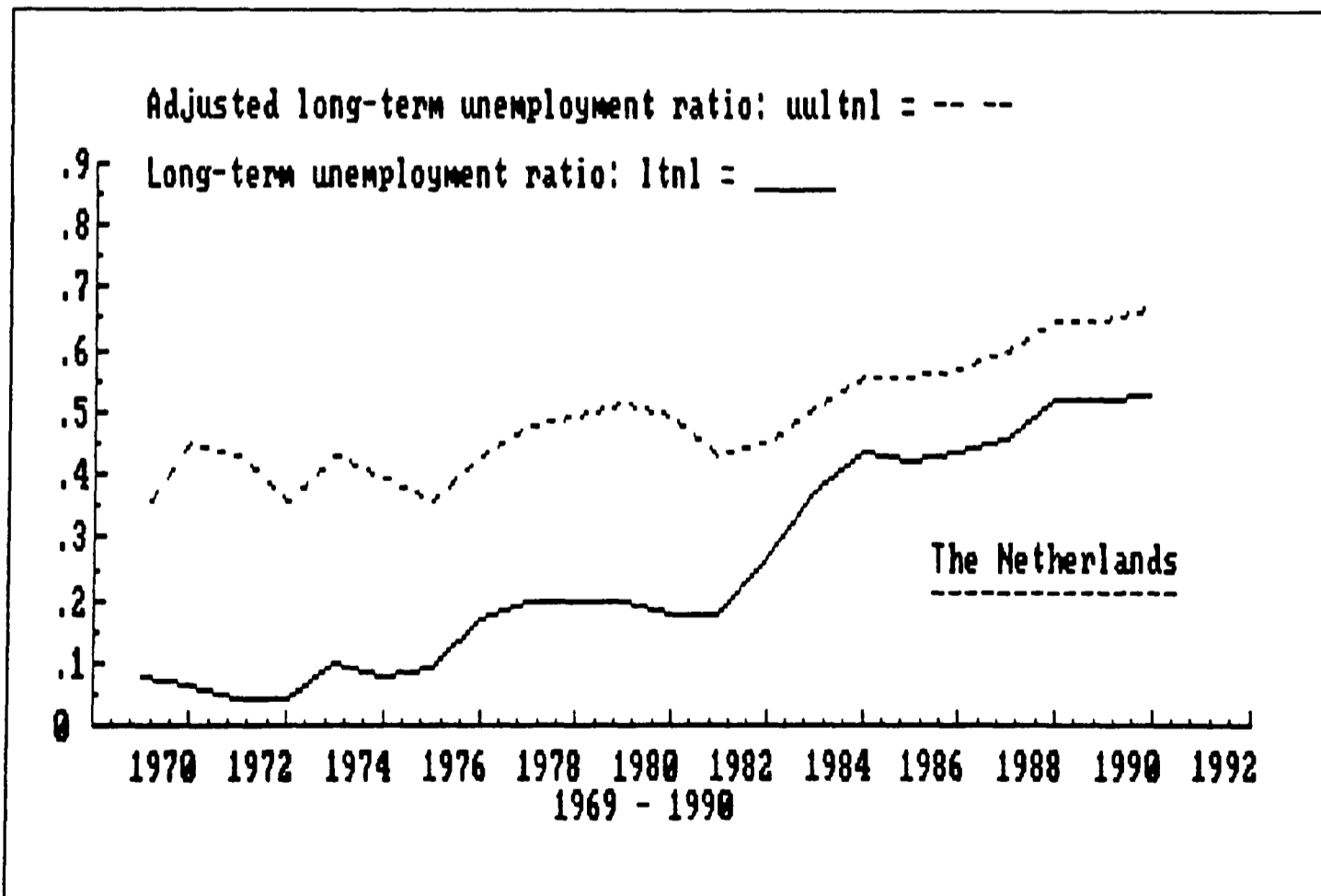


figure 11. Dutch (Adjusted) Long-term Unemployment Ratios.

labour market.

Given the above, it is clear that a massive stock of (long-term) unemployment is hidden among those enlisted on the AAW\WAO scheme, with its consequences for the average search intensity of all the unemployed and choosiness of employers. Therefore, the increase in the number of persons enlisted on the AAW\WAO, which reduced the increase in registered long-term unemployment, could well affect the position of the 'true' Dutch *Beveridge curve*.

4.3. Particular Swedish Institutional Arrangements.

4.3.1. Swedish Labour Market Policies.

In this section we will focus on the Swedish labour market policy programs which have a quite significant impact on the Swedish economy. For quite a long time now Sweden has had a unique approach towards tackling labour market problems. This is without doubt due to the solidaristic attitude of the Swedes. It also reflects the fact that the Swedish social democrats have been in power for fifty-three of the last fifty-nine years⁵⁷. Since the mid-fifties, the Swedes have been pursuing their own method of trying to find a non-inflationary wage policy and at the same time keeping unemployment at an acceptable level (in Sweden that means very low)⁵⁸.

In Sweden the social security laws are implemented by twenty four state county administrations and the central welfare agencies⁵⁹. Among the most important are the 'Riksforsakringsstyrelsen', the national social insurance board, and

⁵⁷ For a description of the actual state of mind in Swedish politics, see The Guardian (1991), p. 23. The electorate's loss of faith in the social democrats resulted in the election of a conservative as the new Swedish prime minister. This will most probably lead to slight adjustments towards the Swedish social welfare system rather than fundamental changes, see The Economist (1991a), p. 60, and p. 65. Also, The Economist (1991c), p. 69.

⁵⁸ Also, see The Economist (1991b), p. 65.

⁵⁹ For a lengthy description of the Swedish social security system see Olsson (1989).

the 'Arbetsmarknadsstyrelsen' (AMS), the labour market board.

In Sweden, most probably more than anywhere else, unemployment is regarded as a social cost. The central government should, in the eyes of the Swedes, intervene in the workings of the labour market in order to keep unemployment at an absolute minimum. Although central government is ultimately responsible, the AMS, the Swedish labour market board, is the central authority for Swedish employment and manpower policies. It is assisted by twenty four county labour boards which include representatives of unions (LO) and entrepreneurs organizations (SAF)⁶⁰. In Sweden about seventeen and a half percent of the money spent by the employment service is spent upon labour market training, a remarkable feature in comparison with Great Britain and the Netherlands (see table 12.). Even more remarkable is the Swedish approach to labour demand policies. Approximately thirty percent of the employment service budget is spent on it. Some of these programs are especially established for disabled workers (see the subsequent paragraph), whereas others are designed to create temporary jobs for the unemployed. Other features of the labour demand stimulating policies include employment subsidies and mobility grants for the unemployed. The relief works program is the main program aimed at cushioning the effects of fluctuations in labour demand. Relief jobs do have a counter-cyclical character, *i.e.* more people are employed in those programs when labour demand is low, whereas during a boom period a low number of workers is employed on the relief programs⁶¹ (see

⁶⁰ For a more detailed description of the Swedish labour market policies see, among others, Olsson (1989), pp. 293-298 and Rehn (1985), pp. 62-89. As regards the analysis of the impact of these policies, see Björklund (1990a).

⁶¹ See Rehn (1985), p. 70, and Wadensjö (1990), p. 3.

table 17.). A relief job typically lasts for less than six months. Unemployed persons who have less than fifty days left before their benefit runs out can legally claim a relief job.

The young unemployed are guaranteed a place in a youth team. That is in general part-time employment (four hours per day) in the public sector, *e.g.* the local county council. The youngsters get paid the market wage. The Swedes put the government as an employer of last resort approach into practice⁶². About thirty percent of the employment service budget is spent on these job creation policies, which is about as much as the amount of money spent on unemployment benefits. The Swedes go in for job creation measures rather than unemployment transfers. This, as we have already seen, is in sharp contrast to the Netherlands.

As stated before, see section 4.1., the Swedes put emphasis on employment services rather than unemployment benefits⁶³. Unemployment insurance (unemployment benefits) are provided for those who have been members of an insurance fund for at least a year. Duration of the benefit is 300 days, for those who are 55 years and older it is 450 days (it is possible to enjoy a benefit for 60 weeks, work in a temporary relief job for about five months after which one starts to enjoy the benefit once more). One can only apply if unemployment is involuntarily and the unemployed person is not allowed to reject a suitable job offer (this could be a place on the relief works program). Otherwise one immediately loses entitlement to a benefit for four weeks. Repeated rejections lead to non-payment of

⁶² For a theoretical analysis of the concept of the government as an employer of last resort, see Adema (1987).

⁶³ For a detailed outline of the Swedish unemployment benefit system, see Björklund and Holmlund (1991).

a benefit until the person has worked for a period of thirty days. Those who are not eligible for an unemployment benefit by an insurance fund can apply for unemployment cash assistance. The duration of those benefits are limited; about half a year. Only those who are above sixty years of age are entitled to unlimited duration, *i.e.* until one is eligible for an old age pension. The unemployment benefit level is low in comparison with other Swedish social security benefits⁶⁴. In this manner the Swedish government tries to stimulate employment search. However, rather than stimulating employment search it could also stimulate elderly unemployed persons to look for more appealing benefits, such as the disability pension.

The success of the Swedish approach is a topic of current debate. It has been claimed⁶⁵ that the Swedish labour market policies reduce private sector employment, *i.e.* a crowding out (un)employment effect, and has put upward pressure on real wages. We should not forget, however, and its importance is difficult to express in terms of money, that it can be of vital importance to keep the unemployed in touch with the labour market, in terms of not losing skills, work experience, etc. It has been argued⁶⁶ that the flow from relief programs into regular employment is smaller than the flow into regular employment out of the unemployment stock. In other words being in a relief program does not enhance ones chances of a regular job.

In line with several Swedish authors we have constructed an unemploy-

⁶⁴ See Olsson (1989), p. 298.

⁶⁵ See Calmfors and Nymoer (1990), p. 431, and Calmfors and Forslund (1991), p. 1146. Also, see Björklund (1990a).

⁶⁶ See Edin and Holmlund (1991).

ment rate corrected for those in the labour market programs⁶⁷ (RL denotes the number of people enlisted on these programs⁶⁸), in order to compare this rate with the orthodox Swedish unemployment rate, otherwise known as the open unemployment rate. Moreover, this corrected unemployment rate (uc_{sv}) could well reflect the 'true' Swedish unemployment problem. Consequently:

$$UC = U+RL \quad (33.)$$

$$uc = UC/[(U+E)+RL] * 100 \quad (34.)$$

In table 17. and figure 12., we present both the corrected and the open Swedish unemployment rate series. Obviously, the corrected unemployment is persistently higher than the open unemployment rate. What is more interesting is that even the corrected Swedish unemployment rate never exceeds the six percent value during the sample period. The British and Dutch experience is, as we have seen, unfortunate for them, rather different. Moreover, despite the current debate on the efficiency of the Swedish labour market, it seems fair to assume that a place on one of these labour market programs is to be preferred, given the value of work

⁶⁷ See, among others, Calmfors (1991) and Edin and Holmlund (1991).

⁶⁸ There are other labour market programs for which we have not presented data in table 17., for instance the 'in plant training' program. Approximately 16 000 people were enlisted on this program in 1977. However, this program has lost its significance. Over the last five years the number of people on this program has not been higher than 200. As regards 'recruitment subsidies' and 'youth teams', we only have data for the period 1984-1990. Consequently, we have not included these numbers in our adjusted Swedish unemployment figures. Again, these programs seem to have lost their significance. Approximately 35 000 persons benefited from these programs in 1984. This number was reduced to less than 4 000 in 1990. Source: see the notes on table 17., Ad.(1).

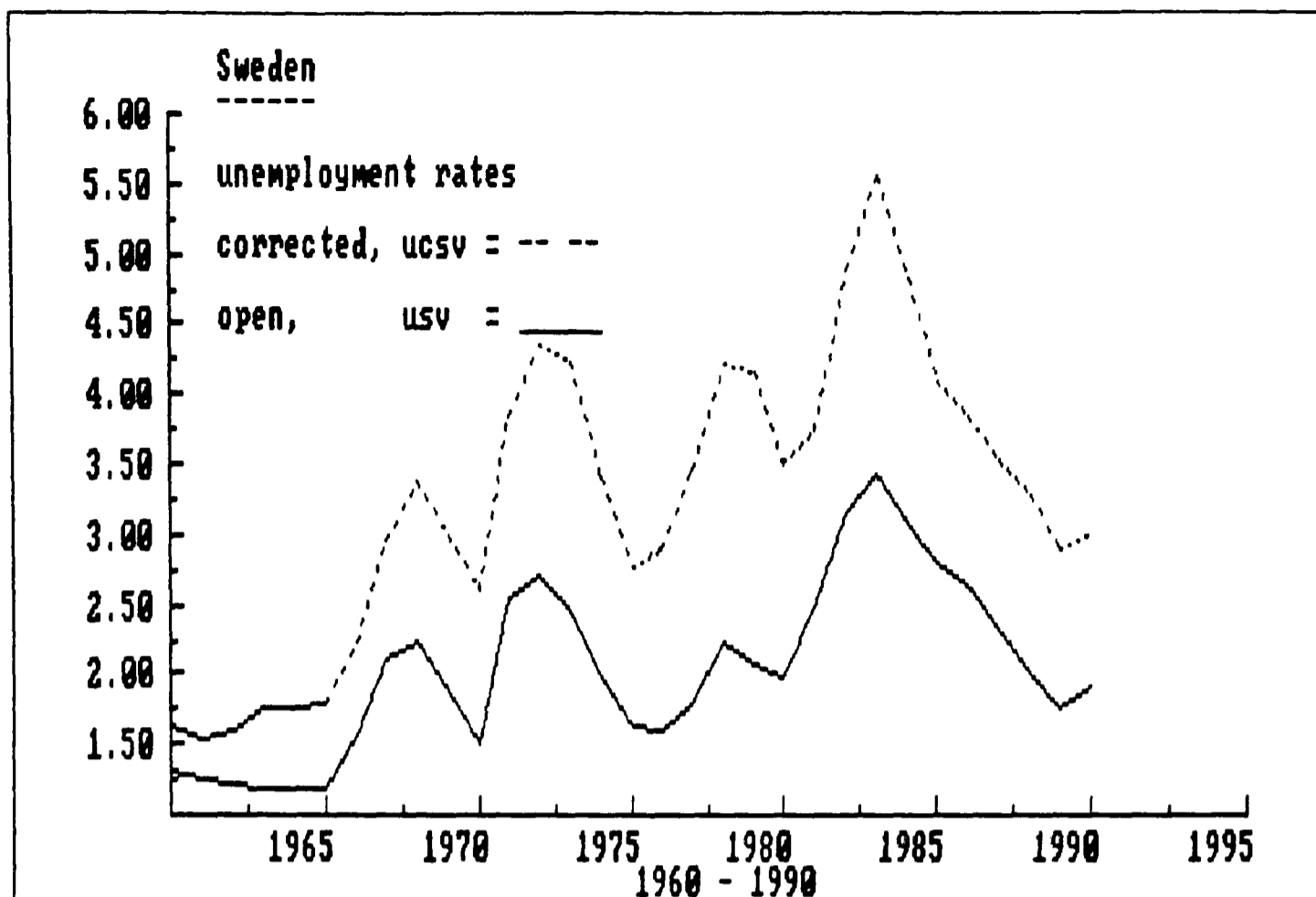


figure 12. Swedish (Corrected) Unemployment Rates.

experience, over a situation where the person is doing nothing at all.

Also depicted in table 17. is the countercyclical character of the labour market programs. In years of high (by Swedish standards) unemployment there are more people in the relief works program. Note, the years of high unemployment, for instance 1968 (in comparison to 1970), 1972 (compared with 1975) and 1983 (compared with 1980). In figure 13. we present the adjusted Swedish *Beveridge curve*, i.e. the long-run relationship between the corrected Swedish unemployment figures (uc_{sv}) and vacancies (v_{sv}).

We recall figure 4.B. which displays the Swedish *Beveridge curve* as presented in chapter two. As we can see, the graphs are reasonably similar. Although the adjusted Swedish *Beveridge curve* looks less compact. Looking at the adjusted *Beveridge curve* one has to come to the conclusion that an outward shift

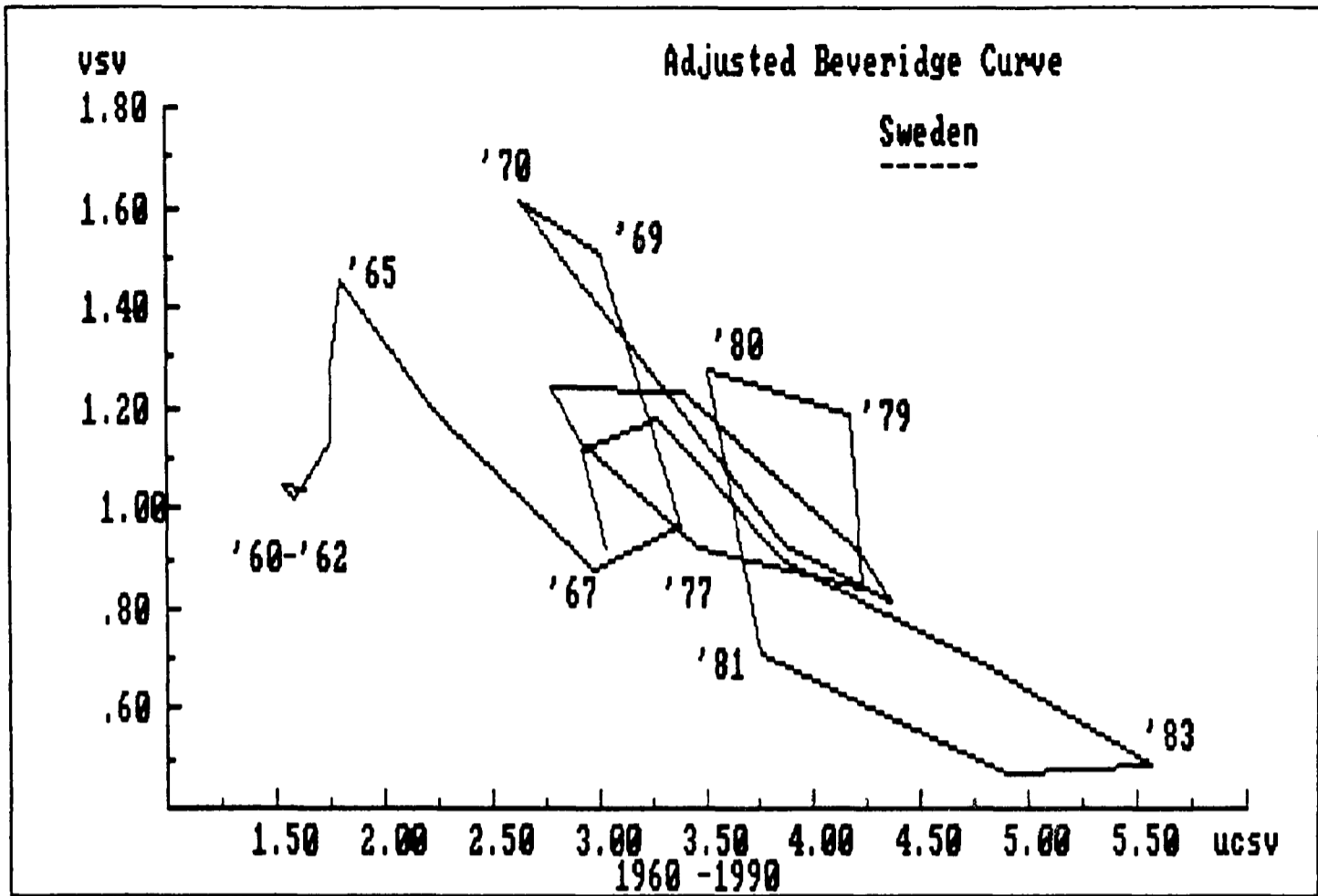


figure 13. The Adjusted Swedish *Beveridge Curve*.

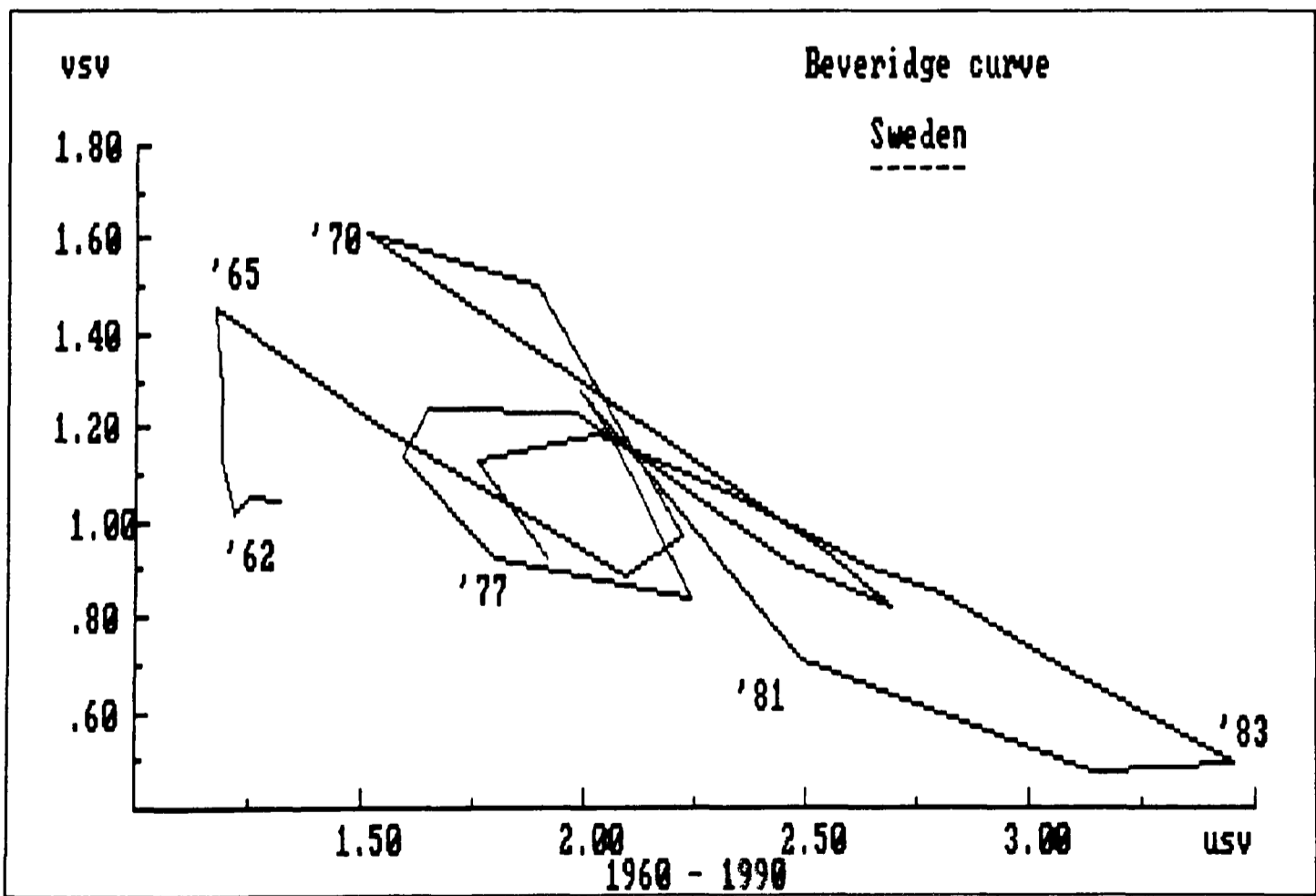


figure 4.B. The Swedish *Beveridge Curve*.

table 17. Sweden: Labour Market Programs.

Year	Relief Works (1)	Labour Market Training (2)	Unemployment rate u_{sv} (3)	Corrected Unemployment rate uc_{sv} (4)
1960	5 442	6 182	1.317	1.638
1961	2 765	7 587	1.250	1.527
1962	4 639	9 460	1.220	1.590
1963	9 367	11 708	1.189	1.748
1964	8 564	12 832	1.188	1.755
1965	8 743	14 892	1.176	1.796
1966	8 207	17 609	1.556	2.222
1967	12 222	22 011	2.093	2.973
1968	18 110	27 724	2.224	3.383
1969	13 917	30 159	1.894	3.003
1970	13 025	31 752	1.508	2.622
1971	16 950	36 903	2.550	3.857
1972	28 904	40 369	2.695	4.364
1973	29 707	43 085	2.464	4.217
1974	20 875	38 121	1.979	3.389
1975	14 809	33 063	1.646	2.773
1976	23 462	32 969	1.591	2.911
1977	25 960	46 082	1.797	3.463
1978	40 501	46 738	2.239	4.228
1979	42 732	51 258	2.062	4.172
1980	22 481	45 117	1.992	3.502
1981	23 143	33 630	2.492	3.754
1982	44 156	36 207	3.145	4.900
1983	58 606	39 209	3.451	5.563
1984 (*)	<u>41 304</u>	38 213	3.097	4.821
1985	23 913	36 202	2.804	4.107
1986	19 175	36 974	2.643	3.862
1987	16 661	39 075	2.320	3.531
1988	13 999	43 879	2.027	3.274
1989	9 947	44 120	1.760	2.914
1990	8 085	44 988	1.915	3.034

Notes on table 17.

- Ad.(*) New sources of information were used as regards the post 1984 period.
Ad.(1) Source: data-tape kindly provided by L. Calmfors, University of Stockholm. Data sources are the (Swedish) Central Statistical Office and the (Swedish) National Labour Market Board.
Ad.(2) See Ad.(1).
Ad.(3) See table 4.B., Ad.(2).
Ad.(4) $uc_{sv} = [U_{sv} + RL_{sv}] / [(U + E_{sv}) + RL_{sv}] * 100$
-

seems to have taken place around 1967.

Another noteworthy aspect in the context of the Swedish economy, is the degree of centralized wage bargaining⁶⁹. Wage bargaining could be highly centralized, with unions and employers' organizations determining the wage, through negotiations, at a national level. On the other hand wage bargaining could be highly decentralized with unions and employers negotiating at plant level. It is argued that the more centralization in wage bargaining the better the macroeconomic performance⁷⁰. Another hypothesis, *i.e.* the 'hump-shaped pattern of centralization', states that both highly centralized, *e.g.* Sweden, and highly decentralized, *e.g.* Switzerland, economies will be more successful as regards macroeconomic performance, whereas economies with a moderate degree of centralization, *e.g.* the Netherlands, will be least successful⁷¹. The high degree of unionisation in Sweden contributed to the high degree of centralized bargaining. However, the Swedish model is under attack, not least due to a diminished influence of the traditional

⁶⁹ For a lengthy discussion and tests of the various hypothesis as regards the degree of centralization in wage bargaining, see Layard, Nickell and Jackman (1991), pp. 129-138, and pp. 412-437.

⁷⁰ See, among others, Bruno and Sachs (1985).

⁷¹ See Calmfors and Driffill (1988), p. 47.

union (LO), caused by the increasing importance of industries where the LO does not have a very strong position⁷². Hence, the degree of centralized bargaining in Sweden is decreasing. This could well have contributed to the increase in the Swedish unemployment rate at the beginning of the nineties.

All in all, it is clear that the existing labour market programs do clearly have their impact on the performance of the Swedish economy. When we take account of these programs in the unemployment figures, their level may increase, but the adjusted Swedish unemployment pattern is still not anything like the patterns of unemployment in Great Britain or the Netherlands.

4.3.2. Swedish Disability Pensioning.

The distribution and administration of the disability pensions in Sweden is taken care of by the national social insurance board and its local branches⁷³. Disability pensions can be paid to persons over sixteen years of age whose working capacity is reduced by at least fifty percent. In comparison, the threshold in the Netherlands is much lower; only fifteen percent and for civil servants twenty five percent. The individual can apply himself/herself or the local social insurance board can take the initiative. One can apply on medical grounds, illness, psychological

⁷² See The Economist (1990), pp. 5-9.

⁷³ For a detailed description of the Swedish disability scheme, see Olsson (1989) and Wadensjö (1984).

problems, alcoholism or physical problems. As in the Netherlands disability not its causes determines whether one is granted a benefit. While assessing the degree of disability one has to take account of the person's health, and its impact on the functioning of that person, *e.g.* deteriorating eyesight has different effects on the functioning of an air force pilot than a civil servant. Also, the availability of a commensurate job should be taken into account.

One can also apply for disability pensions on labour market grounds, *i.e.* when one is no longer entitled to an unemployment benefit of an unemployment insurance society, or once a person has had a cash unemployment allowance for at least four hundred and fifty days and is over sixty years of age (early retirement). Those who were previously in employment first enjoy a sickness benefit⁷⁴ before entrance into the disability scheme. However, there is no one year threshold for entering the disability program as there is for former private sector employees in the Netherlands.

In short, as in the Netherlands, one can be entitled to a disability benefit on basis of medical grounds, labour market grounds or a mixture of these two. Furthermore, all sorts of vague medical reasons can lead to entitlement to a disability pension. The pension committees of the regional social insurance boards decide whether an application is granted or not. Most of the applications, ninety to ninety five percent, are successful.

In Sweden there are two disability pensions, a permanent one which lasts until retirement (as does the Dutch disability pension), and a temporary disability

⁷⁴ Over the last years the (ab)use of the sickness benefit has increased. The Swedish government, keen on controlling their expenses, have taken measures to diminish sickness absenteeism. See the Economist (1990), pp. 15-16.

benefit. Temporary disability benefits are awarded when there is reason to believe that recovery is probable. Despite this, most of those who are first entitled to a temporary benefit receive a permanent disability pension later on. Moreover, there exists a supplementary pension system which was introduced in 1963. This improved the financial situation of the disabled considerably. The supplementary pension is calculated like the disability pension: a one third pension if the working capacity is reduced by 50.0 percent, a two third pension in case of a 66.6 percent reduction, and a full pension if in case of a 87.3 percent reduction in work capacity. The full pension is the most common one⁷⁵.

The above situation of an extensive and rather generous disability pensioning system in Sweden has existed since the mid-seventies. In 1970 several changes as regards the disability system took place; most importantly the introduction of bonus supplements, for those with low or no supplementary income, and the relaxation of conditions for older workers to obtain a disability pension. In 1972, and again in 1974, the legislation was altered to allow older workers, who were in fact long-term unemployed, to enter the disability program, solely on labour market grounds.

All in all, in Sweden there exists a disability pension system with certain similarities to the Dutch system. As in the Netherlands, all sorts of vaguely described medical reasons can entitle a person to a disability benefit, rather than a disability system where occupational diseases (Great Britain) make one eligible for entitlement.

As we have described in section 4.1., both the Netherlands and Sweden

⁷⁵ See Olsson (1989), pp. 283-286, and Wadensjö (1985), pp. 459-473.

provide several employment programs for the disabled. The Swedish national labour board, the county labour boards, the district labour market boards and the local employment offices try to get the disabled workers back to work through the various labour market programs. The main programs are⁷⁶: semisheltered work, sheltered work, archive work and vocational rehabilitation (work training). In June 1978 about 45 000 disabled⁷⁷ had found a place in one of the work programs. This is about seventeen percent of the total number of disabled.

As we have described above, at the end of the sixties and the beginning of the seventies the disability benefit level has increased substantially. Also, several changes in legislation have made the Swedish disability concept as broad as it is now, thereby enhancing widespread eligibility for the program.

"...All this evidence indicates that legislative changes have been the major force behind the rise in disability retirement in Sweden. These changes have provided physically handicapped and sick people with the option of retiring early, and has freed them from having to work for their support during the last few years before the ordinary retirement age..."⁷⁸

This development is also depicted in table 18. As we can see, the number of beneficiaries rose slowly until 1970. Thereafter, the number has risen to a total of approximately 350 000. There is one break in the series after 1976. At that moment the retirement age was decreased from 67 to 65 years of age. Hence, a

⁷⁶ For a complete outline of the work programs for the Swedish disabled, see Wadensjö (1984), pp. 477-489.

⁷⁷ See Wadensjö (1984), p. 484.

⁷⁸ See Hedström (1987), p. 213.

table 18. Sweden: Disabled Pensioners (1).

Year	Regular	Temporary	Total
1960	128 565	14 394	142 959
1961	129 903	15 139	145 036
1962	130 368	15 602	145 970
1963	133 989	16 890	150 879
1964	130 388	16 110	146 498
1965	133 925	16 700	150 625
1966	141 876	19 009	160 885
1967	146 301	20 847	167 148
1968	150 792	21 407	172 199
1969	155 638	22 651	178 289
1970	162 431	22 454	187 885
1971	183 576	28 898	212 474
1972	202 508	33 722	236 230
1973	222 189	38 140	260 329
1974	238 313	39 804	278 117
1975	247 424	41 460	288 884
1976 (*)	<u>254 104</u>	<u>42 542</u>	<u>296 646</u>
1977	213 018	45 075	258 093
1978	224 076	48 719	272 795
1979	231 983	52 149	284 132
1980	239 057	54 277	293 334
1981	246 383	56 366	302 749
1982	251 317	57 533	308 850
1983	256 687	57 422	314 109
1984	264 593	52 306	316 899
1985	272 716	49 950	322 666
1986	279 565	48 923	328 488
1987	286 544	49 960	336 504
1988	295 015	51 916	346 931
1989	301 289	54 027	355 316

Notes on table 18.

Ad.(*) Source: From 1977 onwards the retirement age has been 65 years of age.
 Ad.(1) Source: regarding the years 1960-1979, Wadensjö (1984), 'Disability Policy in Sweden', in: 'Public Policy Toward Disabled Workers: Cross-National Analysis of Economic Impacts', Burkhauser, Halberstadt and

Haveman (eds.), Cornell University Press, Ithaca and London, p. 464.
Regarding the years 1980-1989, Statistik Årsbok, Statistiska Centralbyrån,
1985, 1987, 1989 and 1991.

lot of disabled pensioners were no longer eligible for a disability pension but became old age pensioners overnight. The number of temporary pensioners has been fairly constant over the last decade, approximately 50 000. The total number of permanent disability pensioners has been increasing steadily over the last decade and amounts to approximately 300 000 in 1989.

Thus, it is understood that it is not an increase in the number of 'real' disabled, nor a deterioration of the Swedish general state of health which has been responsible for the increase in the number of Swedish disability pensioners. This increase is mostly due to two factors: a) an increase in the real value of the disability benefit, the introduction of bonus supplements and the supplementary pension system and, b) an increase in eligibility for the disability program⁷⁹. To be more specific, the introduction of labour market grounds, for older workers, as reason for successful disability pension application.

The above suggests that the Swedish disability system endorses early retirement. In this manner it proves to be, for quite a few workers, a lucrative way of leaving the labour force, and thereby keeping the Swedish unemployment rate

⁷⁹ As regards the evidence for this statement, we refer to the results of a time series study. See Wadensjö (1985), in particular, pp. 18-20. Also, it has been debated whether or not labour market variables, *e.g.* regional unemployment, personal unemployment experience and job security, were responsible for the increase in the number of disability beneficiaries. In particular, the significance of the regional unemployment situation has been questioned. See Hedström (1987) and Wadensjö (1985).

artificially low⁸⁰.

This brings us to the same question we have faced in the context of the Dutch disability scheme. What is the amount of true disability and is there a hidden(or disguised) unemployment component among those enlisted on the disability scheme?

The Swedish authors cited above, unlike some of their Dutch counterparts, do not come to the conclusion that there is a substantial hidden unemployment component in the Swedish disability stock⁸¹. However, as we have seen, the number of disabled Swedish pensioners has grown. This is most certainly due to a changed attitude of the state (relaxation of rules), on top of a common interest of employers and employees to opt for the disability way out the labour force (we will return to this point in chapter 6., when we compare our findings regarding the respective countries). We can pursue our investigation as regards those who retired early into the disability pension scheme for labour market reasons. Data on this feature of the Swedish labour market is available. In line with our proceedings in our Dutch discussion of disability features, we have computed variables indicating the relevance of the Swedish unmeasured unemployed. (For reasons of consistency, we maintain this term, despite the fact that it is not literally appropriate.) Therefore, we recall several equations:

$$uu = UU/[UU+(U+E)] * 100 \quad (29.)$$

⁸⁰ See Wadensjö (1990), p. 25-26.

⁸¹ A spokeswoman for the National Social Insurance Board has made a statement to the same effect.

$$uw = [UU+U]/[UU+(U+E)] * 100. \quad (30.)$$

$$UULT = UU + LTU \quad (31.)$$

$$uult = UULT/(U+UU) \quad (32.)$$

$$uc = UC/[(U+E)+RL] * 100 \quad (34.)$$

$$ucw = [UU+UC]/[UU+(U+E)+RL] * 100. \quad (35.)$$

Equation (32) denotes the adjusted long-term unemployment ratio. We think the use of the UU_{sv} stock is justified for such a computation, because if the pensioners had not been allowed into the disability stock for a labour market reason they most certainly would have been unemployed for a long spell, *i.e.* until the retirement age. Furthermore, equation (35) is new, and it represents an unemployment rate corrected for both the number of people enlisted on labour market programs (RL) and the unmeasured unemployed (UU). The miscellaneous Swedish unemployment rates and long-term unemployment ratios are presented in table 19.

As we can see (table 19.), the number of people in the disability stock for labour market reasons (UU_{sv}) is not impressively high, despite an increase in the middle of the eighties. Thus, the Swedish hidden unemployment rate (uu_{sv}) has values of suitable modesty, in comparison with its Dutch counterpart (see table 15.). It seems that apart from in the mid-eighties, the influence of the adjustment for the unemployment component of the disability stock has only a very marginal effect on the Swedish unemployment figures (compare $uult_{sv}$ with lt_{sv} , uw_{sv} with u_{sv} and ucw_{sv} with uc_{sv}).

table 19. The Swedish Unmeasured Unemployed.

Year	UU_{sv} (1)	uu_{sv} (2)	lt_{sv} (3)	$uult_{sv}$ (4)	u_{sv} (5)	uw_{sv} (6)	uc_{sv} (7)	ucw_{sv} (8)
1972	1100	.028	.176	.184	2.695	2.722	4.364	4.390
1973	2600	.065	.188	.209	2.464	2.528	4.217	4.279
1974	2700	.067	.166	.193	1.979	2.045	3.389	3.453
1975	2250	.054	.165	.192	1.646	1.700	2.773	2.826
1976	2400	.058	.160	.189	1.591	1.648	2.911	2.967
1977	2600	.062	.163	.191	1.797	1.858	3.463	3.522
1978	3400	.081	.183	.212	2.239	2.318	4.228	4.304
1979	4200	.098	.196	.233	2.062	2.158	4.172	4.264
1980	5700	.132	.177	.228	1.992	2.121	3.502	3.628
1981	5800	.134	.184	.226	2.492	2.623	3.754	3.881
1982	5900	.135	.223	.255	3.145	3.276	4.900	5.026
1983	7600	.173	.250	.286	3.451	3.619	5.563	5.723
1984	12000	.273	.281	.339	3.097	3.361	4.821	5.076
1985	15800	.366	.273	.355	2.804	3.149	4.107	4.444
1986	16500	.371	.220	.316	2.643	3.004	3.862	4.215
1987	15500	.348	.231	.332	2.320	2.660	3.531	3.862
1988	14600	.324	.212	.321	2.027	2.344	3.274	3.583

Notes on table 19.

- Ad.(1) UU_{sv} : number of people retired into the disability pension scheme for labour market reasons. Source: Regarding the years 1980-1988, Statistika Centralbyrån (1989), The Labour Market in Figures. Employment, Unemployment, etc., 1970-1988, SCB, Stockholm, p. 196. Regarding the years 1972-1979, we have computed the data on basis of available data (the same source as cited above) on new disability pensioners due to labour market reasons.
- Ad.(2) uu_{sv} : Swedish hidden unemployment rate.
 $uu_{sv} = UU_{sv} / [UU_{sv} + (U + E_{sv})] * 100.$
- Ad.(3) See table 8., Ad.(3).
- Ad.(4) $uult_{sv}$: adjusted Swedish long-term unemployment ratio.
 $uult_{sv} = (UU_{sv} + LTU_{sv}) / (U_{sv} + UU_{sv}).$
- Ad.(5) See table 4.A., Ad.(2) and table 4.B..
- Ad.(6) uw_{sv} : Swedish unemployment rate corrected for pensioners in the disability stock for labour market reasons.
 $uw_{sv} = [UU_{sv} + U_{sv}] / [UU_{sv} + (U + E_{sv})] * 100.$
- Ad.(7) See table 17., Ad.(1), Ad.(3) and Ad.(4).
- Ad.(8) ucw_{sv} : Swedish unemployment rate corrected for both the disability

pensioners for labour market reasons and those enlisted on the labour market programs.

$$ucw_{sv} = [UU_{sv} + UC_{sv}] / [UU_{sv} + (U + E_{sv}) + RL_{sv}] * 100.$$

Thus, it does not seem that the inflow of pensioners into the disability stock for labour market reasons has had a significant impact on the Swedish unemployment pattern. We will discuss tests of this hypothesis in the following chapter.

4.4. British Sickness and Disability Regulations.

In the previous two paragraphs we have discussed the characteristics of disability pension institutions in the Netherlands and Sweden, where a rather broadly defined concept of disability is in fashion. We will now turn our attention to the British social security institutions, especially those regarding sickness and disability.

Social welfare institutions in Britain are rooted in the ideas of William Beveridge. The recommendations as formulated in the 'Beveridge Report' are widely regarded as the foundation of the British welfare state⁸².

In Great Britain there are two types of benefits. The first type are contributory benefits such as the 'Unemployment Benefit', 'Sickness Benefit', 'Invalidity Benefit', 'Retirement Pension', 'Widow's Benefit' and the 'Maternity Allowance'. Most British persons between sixteen and sixty five years of age (for women the retirement age is sixty years) must pay contributions to the 'National Insurance' scheme. This entitles them to National Insurance (NI) benefits the moment need arises. One is only entitled to the NI benefits if one has paid enough, or in some cases has been credited with enough, contributions of the right sort at the right time to the NI scheme⁸³.

⁸² See Beveridge (1942).

⁸³ There are four categories of contributions depending on whether a person is in public or private employment, unemployed, self-employed and the amount of profits one makes, and the level of personal income. Also, the length of time over which one has been paying contributions determines whether a person is entitled to a benefit and its level. See the Social Security (Contributions) Act 1991, sections 1-3, and the Social

The second type of benefit is non-contributory⁸⁴. Examples include the 'Invalid Care Allowance' (a weekly cash benefit for people who spend a lot of time looking after someone who is severely disabled) and 'Age Addition Payable' (for persons who are over eighty years of age). Furthermore, benefit claimants may be entitled to various additional benefits depending on the number of dependants (not necessarily children)⁸⁵. Depending on the level of income of the benefit claimant, he\she may be entitled to 'Income Support', 'Housing Benefit' (this is a rent rebate or allowance for those who find it hard to pay their full rent), 'Community Charge Benefit' (like the housing benefit but regarding the community charge or poll tax) and 'Family Credit' (a tax free benefit for working families with children)⁸⁶. Furthermore, there is the 'Social Fund' which can be applied to by a person with a low income facing an exceptional expense⁸⁷. For instance, if the British winter is hard, one can apply for 'Cold Weather Payment'.

A person can claim Unemployment Benefit if he\she has paid sufficient NI contributions. One is only eligible for UB if one is available for work with an employer and one does not make unreasonable demands regarding hours of work,

Security Act 1975, sections 1-11.

⁸⁴ See Social Security Act 1975, art. 12, and art. 34.

⁸⁵ See Social Security Act 1975, art. 41-49.

⁸⁶ The 1988 reform of the social security system in Great Britain meant the end of the Supplementary Benefit scheme, which was discarded because of its complexity. A new income support scheme came in its place. For detailed information regarding the various sorts of income support for persons on low incomes, see Department of Social Security (1991b), pp. 8-14, Morris and Llewellyn (1991), pp. 45-56, and The Existing Social Security System (1985). Also, see the Social Security Act 1986, part II; 'Income Related Benefits', sections 20-31.

⁸⁷ See the Social Security Act 1986, part III; 'The Social fund', sections 32-35.

pay, location or type of employment. There are several situations which disqualify an unemployed person from Unemployment Benefit. As the British law used to state it:

"...After a situation in any suitable employment has been properly notified to him as vacant or about to become vacant, he has without good cause refused or failed to apply for that situation or refused to accept that situation when offered to him..."⁸⁸

Nowadays, the British unemployed person is actually supposed to be actively engaged in job-search. As becomes clear when we take the latest revision of the British law regarding the disqualification for Unemployment Benefit into account:

"...Regulations make provision with respect to: steps which a person is required to take in any week if he is to be regarded as actively seeking employed earner's employment in that week..."⁸⁹

Note, an employed earner is a person who is gainfully employed in Great Britain either under a contract of service, or in an office (including elective office)⁹⁰. Thus, the requirements regarding UB eligibility have become more strict (also, remember the discussion on the decline of British long-term unemployment at the

⁸⁸ See Social Security Act 1975, subsection 20-b. For other reasons of disqualification, e.g. misconduct and voluntary unemployment, see section 20 of that Act.

⁸⁹ See Social Security Act 1985, subsection 17-(2), as amended by Social Security Act 1989, subsection 10-(3).

⁹⁰ See Social Security Act 1975, art. 2-(1).

end of the eighties, see section 3.4.). For instance, regarding the prior quotation of the 1975 Social Security Act, the reference to 'suitable employment' has been altered into a reference to 'employment', thereby, making it harder for the unemployed to refuse any job offer⁹¹. As we have stated before, the Swedes do not show a lot of mercy for those who do not accept job-offers or training places. However, they actually do offer those places to the unemployed. This is not the case in the United Kingdom and the Netherlands. Also, it seems that the British authorities are tougher than their Dutch counterparts as regards job-search requirements⁹².

The level of the British UB is not very high: forty one pounds and forty pence per week (this amount is reserved for an unemployed single person under state pension age and it does not include other possible benefits)⁹³. Moreover, UB is limited to a twelve month period. This is not completely in line with the proposals of Lord Beveridge:

"...payment of unconditional cash benefits as of right during unemployment is satisfactory provision only for short periods of unemployment; after that, complete idleness even on an income demoralises. The proposal of the Report accordingly is to make unemployment benefit after a certain period conditional upon attendance at a work or training centre. But this proposal is impracticable, if it has to be applied to men by the million or the hundred thousand..."⁹⁴

⁹¹ Regarding the latest regulations on disqualification for UB, See Social Security Act 1989, sections 10-12.

⁹² For an extensive overview of the impact of continuous changes regarding the British unemployment benefit over the last decade on the income of those receiving unemployment benefit, see Atkinson and Micklewright (1989).

⁹³ See Department of Social Security (1991a), p. 9 (these are the April 1991 rates).

⁹⁴ See Beveridge (1942), p. 163.

The proposal is very much in line with Swedish practice as regards the unemployed. Beveridge realized that mass unemployment would hamper the effectiveness of his social security plan⁹⁵. After the one year period of Unemployment Benefit entitlement the long-term unemployed have to turn to the Income Support scheme (before 1989, the Supplementary Benefits scheme)⁹⁶.

As in the Netherlands and Sweden, those who are in private sector employment can claim sick pay when ill. **Only** after four days of illness can private sector employees claim 'Statutory Sick Pay' (SSP)⁹⁷ which was introduced in 1982. In Sweden, labourers can claim sick pay from the first day onwards, which is also common practice in the Netherlands (see paragraph 4.2.1.). Many employers in Great Britain have their own sick pay scheme⁹⁸ which often entitles employees to sick pay, of an amount which at least equals SSP, for the whole spell of sickness. In comparison to the Netherlands and Sweden, where the full wage is being paid, sick pay in Britain is at a low level. A flat rate of fifty two pounds and fifty pence per week (when average gross weekly earnings were one hundred and eighty five

⁹⁵ Beveridge was of the opinion that his work was not finished with completion of the Beveridge Report. Therefore, he wrote a second report, see Beveridge (1944), on a policy for full employment. Full employment had been assumed in order to make his social security plan work. Also, see Harris (1977), pp. 378-451.

⁹⁶ For lengthy and detailed descriptions on the British benefit provisions for the unemployed and the impact of the changes in legislation of the last few years, see, among others, Brown (1990), Hill (1990), and Morris and Llewellyn (1991).

⁹⁷ See Social Security and Housing Benefits Act 1982, part I; 'Statutory Sick Pay', sections 1-27, and Social Security Act 1985, sections 18-21. Also, see Department of Social Security (1991d).

⁹⁸ See Department of Social Security (1988).

pounds or more)⁹⁹, not including possible other benefits, *e.g.* 'Housing Benefit' or 'Christmas Bonus'. Nevertheless, most public sector employers 'top up' the sickness pay to full level. This is less likely in the private sector, and if so, it applies more often to non-manual staff rather than manual workers.

As stated above, most members of the British work force are covered by occupational sick pay schemes¹⁰⁰. However, it must be noted that this kind of coverage mostly applies to short-term sick pay schemes (like SSP), rather than the longer term invalidity provisions¹⁰¹. For those who are not entitled to SSP, *e.g.* the unemployed and self-employed, a 'Sickness Benefit' (SB)¹⁰² is available when previous National Insurance contributions have been sufficient¹⁰³.

It is noteworthy that the British government under Mrs. Thatcher has been trying to curb expenditure on social security provisions¹⁰⁴. Hence, the encouragement of the development of occupational and personal pension schemes. This to reduce the number of people reliant on the earnings-related component of the state

⁹⁹ See Department of Social Security (1991a), p. 9 (April 1991 rates). For an overview of the developments over time of the rates of various British benefits, see Department of Social Security (1991c).

¹⁰⁰ As Regards the latest developments regarding the occupational pension schemes, *e.g.* alterations in the conditions with regard to employment related benefits and the introduction of a registrar of these schemes as well as a 'Pensions Ombudsman', see Social Security Act 1989 and Social Security Act 1990.

¹⁰¹ See Social Security Advisory Committee (1988), p. 40.

¹⁰² See Social Security Act 1975, sections 14 and 17. Also, see Department of Social Security (1991e).

¹⁰³ Those who have not paid enough National Insurance contributions are, in case of disability, entitled to the Severe Disablement Allowance.

¹⁰⁴ For an extensive overview on how the 'Thatcher' Government has tried to curb expenditure on social security provisions, pensions and sickness related benefits in particular, see Creedy and Disney (1989).

pension scheme. A scheme whose benefits were also affected in 1986¹⁰⁵.

Both Sickness Benefit and Statutory Sick Pay only last for twenty eight weeks. SSP only lasts for that long since April 1986, before then, SSP could only be claimed for eight weeks¹⁰⁶. Together with this change the Industrial Injury Benefit was abolished¹⁰⁷. After the eligibility for SSP and SB runs out one can, in case of prolonged illness, apply for a invalidity benefit. Invalidity Benefit remains payable until one reaches an age five years beyond retirement age (provide of course that the claimant is still unfit for work). Retirement pension is usually at the same level as the invalidity benefit. However, retirement pension is taxable. The British invalidity benefit consists of three parts¹⁰⁸. 'Invalidity Pension' is usually paid when Statutory Sick Pay or Sickness Benefit has run out. Also, a person is entitled to 'Invalidity Allowance' if the illness began when he\she was under a specific age (for men sixty years, woman fifty five years of age)¹⁰⁹. Furthermore, there is 'Additional Pension' for those who became entitled to an invalidity benefit after April 1979 (the Invalidity Allowance is reduced by the amount of Additional Pension). For those who have not paid enough contributions to be eligible for invalidity benefit (these people were also not eligible for Statutory Sick Pay and Sickness Benefit), 'Severe Disablement Allowance' (SDA) is

¹⁰⁵ See Creedy and Disney (1989), p. 212.

¹⁰⁶ See Department of Social Security (1991c), p. 118.

¹⁰⁷ See Creedy and Disney (1989), p. 211.

¹⁰⁸ See Department of Social Security (1991b), pp. 23-24, and Social Security Advisory Committee (1988), section 4.

¹⁰⁹ Under certain conditions one might also be eligible to 'Additional Pension', a 'Christmas Bonus', etc. See Department of Social Security (1991b), p. 23.

claimable¹¹⁰. This is a tax-free benefit for those who became incapable for work after their twentieth birthday and who have been incapable for work for twenty eight weeks. The applicants have to be assessed as at least eighty percent disabled¹¹¹.

In Great Britain (in sharp contrast to the Netherlands and Sweden) there are special legal arrangements for those who have become incapable of 'work' - work which the person in question can reasonably be expected to do¹¹² - as a result of an accident at work or an industrial disease. This applies to all 'employed earners'. Note, a person has to be at least fourteen percent disabled because of the accident and/or industrial disease¹¹³, but need not have paid National Insurance contributions to qualify for the 'Industrial Injuries Disablement Benefit' (IIDB). The IIDB may even be obtainable when one returns to work. Thus, occupation related benefits do exist in the Great Britain¹¹⁴. The level of the benefit depends on the degree of disability. In case of a hundred percent disability one is entitled to

¹¹⁰ In 1984 Severe Disablement Allowance replaced the 'Non-Contributory Invalidity Pension' and the 'Housewives Non-Contributory Invalidity Pension'. People who were enlisted on these two schemes were entitled to SDA

¹¹¹ Those who receive 'Attendance Allowance', *i.e.* a tax-free benefit for those who need a lot of looking after because of their mental or physical handicap, 'Mobility Allowance', a tax-free cash benefit for those who are unable to walk or otherwise have difficulties outdoors (blind persons), or who are severely disabled as a result of vaccination (see Vaccine Damage Payments Act 1979 and Social Security Act 1985, section 23) are automatically regarded as eighty percent disabled, and thus eligible to SDA. See Social Security Advisory Committee (1988), p. 18.

¹¹² See Social Security Act 1975, art. 56-2.

¹¹³ For a list of the industrial diseases, see Department of Social Security (1990a).

¹¹⁴ For a lengthy outline of the regulations regarding industrial injuries and industrial diseases, see Social Security Act 1975, art. 50-78 and the Industrial Injuries and Diseases (Old Cases) Act 1975. Also, see Department of Social Security (1990b).

eighty five pounds per week¹¹⁵ (note, this is excluding additional benefits). A beneficiary of the IIDB is entitled to 'Constant Attendance Allowance' and 'Exceptionally Severe Disablement Allowance' when that person is in need of constant care and attention. When the loss of faculty turns out to be permanent, one can apply for 'Unemployability Supplement'. When a person cannot return to his\her regular occupation or a comparable job due to industrial accident caused disablement he\she can claim 'Reduced Earnings Allowance'.

The above makes clear that Great Britain has a sickness and disability system which, unlike the Netherlands and Sweden, does not include one or two generous general benefits. The basic provisions are supplemented by all sorts of allowances and bonuses aimed at persons with specific needs. Nevertheless, there remain various problems¹¹⁶. Recently, the British Government, while trying to aim the help at those who are most in need of it, found it necessary to alter the British regulations regarding disability¹¹⁷. One of the four guidelines for reform is the emphasis on the disabled earning income rather than getting it:

"...The gaps and disincentives in the current benefit arrangements point to the need for a new approach to supporting and encouraging disabled people to take up work. That need is underlined by the results of the OPCS (Office of Population Censuses and Surveys) surveys which found that only 31% of disabled non-pensioners were earning. The surveys also found that the average net equivalent income of disabled

¹¹⁵ See Department of Social Security (1991a), p. 6 (April 1991 rates).

¹¹⁶ For a complete description of the state of affairs concerning the British government's stand on disability policy (reforms which have already been implemented and future reforms), see Department of Social Security (1990c).

¹¹⁷ For a discussion of the latest developments as regards British disability regulations, see Dalley (1991), and Walker and Walker (1991).

non-pensioners was 73% of the average net equivalent income for non-pensioners in the general population. The absence of earned income is a major cause of this discrepancy..."¹¹⁸

The above indicates that the disability benefit system in Britain¹¹⁹ is less generous than its Dutch and Swedish counterparts. However, the actual British regulations might discourage disabled persons from starting employment, because their benefit entitlements (SSP or SB) after an unsuccessful spell of employment will be less appealing¹²⁰. Thus, the British government plans (in 1992) to introduce a 'Disability Working Allowance' (DWA) aimed at those who are only partially disabled. The DWA will 'top up' the low income of the beneficiaries¹²¹.

As we can see in table 20.A., the number of beneficiaries of the Sickness and Invalidity benefit schemes in the United Kingdom has slightly increased over the years. There has not been a huge increase in numbers as in the Netherlands.

¹¹⁸ See, Department of Social Security (1990c), p. 33.

¹¹⁹ Regarding Northern Ireland there exist separate social security regulations. For instance, see Social Security (Northern Ireland) Act 1975 and the Industrial Injuries and Diseases (Northern Ireland) Act 1975. In most Acts special references with regard to Northern Ireland are being made, e.g. Social Security Act 1989, section 24, Social Security Act 1990, section 22, and Disability Living allowance and Disability Working Allowance Act 1991, section 13.

¹²⁰ For a discussion on the employment prospects of the disabled, see Floyd (1991).

¹²¹ See Department of Social Security (1990c), pp. 31-35. Furthermore, see Disability Living Allowance and Disability Working Allowance Act 1991. These acts introduced the Disability living allowance, which consists of a care component, replacing the Attendance Allowance, and a mobility component, covering the mobility Allowance. The Disability Working Allowance - sometimes referred to in the literature as the Disability Employment Credit - is an income related benefit which is obtainable if the disabled person works, while his\her disability puts him into a disadvantaged position and his\her income is below a certain level.

At first sight one could describe the growth as normal, *i.e.* because of growth of the population and the labour force. However, the 'SB+IVB' figures do not include recipients of SSP incapacitated for less than twenty eight weeks (see the notes on table 20.A., Ad(1). So, the introduction of SSP (and the consequent decline in the numbers on SB), and the extension of its length in 1986, had an adverse affect on the growth of the series. This explains the break in growth which occurred in 1983-1984 (see table 20.A.).

Consequently, it appears to be more appropriate to look at the number of people on Invalidity Benefit. This is depicted in the 'IVB-column' in table 20.A. below. Now, we see that there has been a marked rise in the number of people receiving Invalidity Benefit in the United Kingdom, especially since the beginning of the eighties. This growth has been linked to the rise in unemployment¹²². Therefore, it seems imperative to consider whether Britain suffers from the same hidden unemployment problem of which the Netherlands, and to a far lesser extent, Sweden are suffering.

There appear to be three underlying trends as regards the increase in IVB recipients. First, the increase in the length of the spell on IVB-benefit; second, the rise of the proportion of older IVB recipients, and third; the increase in the number of married woman entitled to Invalidity Benefit. Hence, it is necessary to see why and how this increase in IVB recipients has arisen¹²³.

As already noted, in Britain it is financially far to be preferred to work

¹²² See Creedy and Disney (1989), Disney and Webb (1990) and (1991), Molho (1989) and National Audit Office (1989).

¹²³ See National Audit Office (1989), p. 8-9.

rather than receiving benefit. However, Invalidity Benefit appears to be financially preferable to Unemployment Benefit¹²⁴. Unlike Unemployment Benefit (and the National Insurance Retirement Pension and Income Support) the Invalidity Benefit is not taxable. Also, the introduction of the Severe Disablement Allowance in 1984 could have contributed to the increase in numbers (IVB-claimants could possible be entitled to a number of additional benefits). Also, a partially disabled person is allowed to do some work and earn up to £ 28.5 a week without losing any IVB¹²⁵. Furthermore, the Department of Social Security has, during the last decade, improved the quality of information regarding the various social security schemes, thereby making people more aware of their entitlement to these benefits. It is also noteworthy that older people who make up most of the beneficiaries of the scheme, would have every incentive to remain an Invalidity Benefit claimant, since this benefit is payable for five years after state retirement and remains not taxable¹²⁶. Thus, the duration of a spell on IVB is not limited in the short run. One is eligible until five years after retirement age as long as one has a doctor's statement indicating one is incapable for work. As already stated, the empirical evidence suggests that the average length of a spell on IVB has increased.

By taking financial and duration considerations into account it becomes understandable that persons, facing the choice, prefer to be on IVB rather than UB. Be that as it may, that is not enough reason to assume that there is a hidden unemployment component among the IVB stock. In order to qualify for IVB one

¹²⁴ See Social Security Advisory Committee (1988), pp. 17-18.

¹²⁵ See National Audit Office (1989), p.10 (the figures are 1989 rates).

¹²⁶ See Disney and Webb (1991), p. 261-262.

has to have a doctor's statement which advises the claimant to refrain from work for a specified period. If this incapacity period has lasted for six months and the claimant is unlikely to be able of work again the doctor may advise to refrain from work until further notice¹²⁷. So, only medical reasons can lead to a positive response to any IVB applicant. Because of this, a spokesman for the Statistical Department of the DSS in Newcastle Upon Tyne, simply refused to believe or admit that there is a hidden unemployment component of any size among IVB recipients (not to mention possible data¹²⁸). In light of the above, it is important to note that the British disability schemes do not possess a labour market connection as was in operation in the Netherlands until 1987¹²⁹. Thus, there is no legal framework to provide for a possible flow induced by labour market reasons from unemployment or employment into the British disability stock. This is were the story could end. It does not!

The National Audit Office investigating the growth in the number of beneficiaries and thus expenditure on IVB, while focusing on the medical assessment procedures¹³⁰, found that there is an apparent lack of training and advice

¹²⁷ See National Audit Office (1989), p. 1.

¹²⁸ A spokesman for the Employment Service Disablement Department (concerned with getting disabled people back to work) in Sheffield admitted that there was an unemployment component among those receiving IVB. However, appropriate data were not available.

¹²⁹ Labour market conditions are not taken into account while assessing earning capacity of a disabled person. It seems that the Social Security Advisory Committee has been giving the idea some thought. See Social Security advisory Committee (1988), p. 11. However, we cannot say that the Dutch experience (see section 4.2.) is particularly encouraging!

¹³⁰ For a more detailed discussion of the role of General Practitioners, see National Audit Office (1989c), pp. 11-19.

for General Practitioners who are supposed to perform the disability assessment. More notable is the fact that of the General Practitioners who responded to the survey, only 47 percent identified as one of their roles the provision of evidence on a claimant's fitness for alternative work. Furthermore:

"...In advising a patient whether or not to refrain from work, General Practitioners properly take account of family and social circumstances which might have a bearing on the individual's medical condition. The Gallup survey found that other factors taken into account included loss of benefit if the statement is refused and the fact that a claimant may have been advised by the Job Centre to seek a statement..."¹³¹

Although the author should really refrain from adding yet another derogatory expression containing the word 'Dutch' to the English language, the above suggests that the British disability practices suffer from the 'Dutch Disability Disease'. Furthermore, the National Audit Office asserts that in times of high unemployment the outflow rates out of IVB will sharply reduce because employers rather employ people who are fully fit than those with a poor sick record.

All in all, there seems to be enough evidence to state that the increase in recipients of IVB is related to the increase in aggregate unemployment, which appeared at the beginning of the eighties, and not to medical factors¹³².

That leads us to the question of the hidden unemployment component among IVB recipients. As stated above the DSS has no data on this. And there are no other sources which give clear estimates of its possible size. So, in order to

¹³¹ See National Audit Office (1989), p. 3.

¹³² See National Audit Office (1989), p. 2.

construct some correction factor, with which we can construct an unmeasured unemployment rate, we have to enter the area of 'tentative inferences' again.

As already stated, evidence suggests a clear link between the number of recipients of IVB and unemployment. This causal relationship definitely holds firm for a period of rising unemployment. In particular, the period 1980-1986 which was characterised by high unemployment, saw an substantial increase in the number of recipients of IVB (see table 20.A.). However, with the decline in unemployment there was no decline in the number of IVB recipients. There seems not to be a lagged effect either. The number of IVB just continued to rise. So, apparently, the relationship between unemployment and IVB does not work both ways. Thus, it does not seem appropriate to construct a correction factor which just follows the unemployment trend.

The reason for the breakdown of this 'unemployment-IVB receipt' relationship is not quite clear¹³³. A major factor could be the already mentioned increased length of the average duration of a spell on IVB. This is enhanced by the fact that quite a few of the IVB recipients are near retirement age when they enter the IVB stock. There is no real incentive for them to leave the IVB stock, because they can continue to claim the not taxable IVB for five years after retirement age. The proportion of male IVB recipients over 64 years of age has increased from 9% in 1981/1982 to 16% in 1987/1988. These IVB claimants can hardly be considered as unmeasured unemployed as they are past the retirement age. Another possible reason for the increase in the IVB numbers is the 'Restart Program', which was described in the previous chapter in the context of the British long-term unemploy-

¹³³ See Disney and Webb (1991), pp. 260-262.

ment problem. As we have stated there, the 'Restart Program' was successful in reducing the number of unemployed. However, this reduction was more based on the 'weeding out' of inappropriate benefit claimants rather than getting people back to work. The 'Restart Program' has directed some unemployed persons (with health problems) to more appropriate benefits¹³⁴.

Another possible explanation for the increase in numbers of IVB recipients is the plain statement that those on IVB are truly disabled, and that there is no hidden unemployment component among those enlisted on IVB. However, this would contradict the evidence cited above, and not explain the increase in numbers during the eighties. Moreover, in table 20.A., we present the series 'UNIVB' which will be used to construct a British unmeasured unemployment rate. This series describes the IVB beneficiaries by employment status at the moment of entering the IVB stock, in this particular case unemployed¹³⁵. Although data on employment status are not available from the DSS for the period before 1982, we have no reason to believe that those numbers would be very high. As we can see, the number of IVB recipients whose employment status is unemployed increases dramatically at the beginning of the eighties, coinciding with a sharp increase in British unemployment, whereafter the figure increases with approximately 50 000 a year. Now it is not appropriate to assume that all these people can be described as hidden unemployed. Nevertheless, the upward trend in the figures is quite obvious.

¹³⁴ See Disney and Carruth (1992), p. 20.

¹³⁵ Apparently, the DSS has information as regards the employment status at the moment of entering the IVB stock. Once a year, at the end of March or the beginning of April, the DSS (what the DSS labels at a point in time) measures the numbers. We have to emphasize that these numbers do not reflect the number of unemployed in the disability stock.

table 20.A. Patterns of British Disability (*).

(All figures * 1 000)

Year	SB+IVB (1)	IDP (2)	Year	IVB (3)	UNIVB (4)
1960		175			
1961		181			
1962		188			
1963		193			
1964		198			
1965	1 012	201			
1966	1 041	205			
1967	1 028	205			
1968	1 081	207			
1969	1 090	209			
1970	1 105	211			
1971	1 011	212			
1972	1 027	208	'71-'72	420	
1973	1 064	206	'72-'73	430	
1974	1 064	207	'73-'74	435	
1975	1 037	203	'74-'75	440	
1976	1 045	205	'75-'76	460	
1977	1 068	205	'76-'77	485	
1978	1 180	204	'77-'78	540	
1979	1 238	202	'78-'79	600	
1980	1 197	201	'79-'80	620	
1981	1 156	197	'80-'81	620	
1982	1 198	194	'81-'82	660	27.7
1983	1 202	191	'82-'83	700	118.9
1984	1 044	186	'83-'84	760	218.4
1985	1 098	191	'84-'85	825	263.4
1986	1 141	189	'85-'86	865	309.8
1987	1 168	189	'86-'87	935	359.6
1988	1 278	189	'87-'88	1 010	417.8
1989	1 395	193	'88-'89	1 100	465.5
1990	1 516	197	'89-'90	1 185	514.7

Notes on table 20.A.

- Ad.(*) These data represent yearly averages.
- Ad.(1) SB+IVB: number of beneficiaries to the Sickness and Invalidity benefit schemes. These are figures regarding the United Kingdom, as measured at 31 December of the year concerned. Source: Annual Abstract of Statistics, Central Statistical Office, 1976, 1980, 1990 and 1992, Her Majesty's Stationery Office, London. Note, those claiming SSP are not captured in the numbers (see reference to DSS Ad.(4)).
- Ad.(2) IDP: number of beneficiaries to the Industrial Disablement Pensions scheme. These are figures regarding the United Kingdom as measured at 30 September of the year concerned (after 1986 measurement took place in the beginning of April). Source: Annual Abstract of Statistics, Central Statistical Office, 1970, 1976, 1980, 1990 and 1992, Her Majesty's Stationery Office, London.
- Ad.(3) IVB: total number of beneficiaries of Invalidity Benefit in the United Kingdom. These are estimated average numbers. Moreover, beneficiaries can be receiving other benefits like Severe Disability Allowance or Attendance Allowance. Source: 'The Way Ahead', Department of Social security (1990), HMSO, London, p. 65. For the years up to '78-'79, we have obtained numbers as depicted in Molho (1989), 'A Disaggregate Model of Flows onto Invalidity Benefit', Applied Economics, p. 239.
- Ad.(4) UNIVB: total number of beneficiaries of Invalidity Benefit at a point in time by unemployment status. All Employment status includes 'self-employed', 'employed', 'unemployed' and 'not known or other'. Source: DSS (statistics department Newcastle Upon Tyne), letter to the author d.d. 22-12-92. The correspondence contains these data and further detail on data series as published by the DSS.
-

We have constructed a couple of unmeasured unemployment series, which we will use to test for the possible impact on the British unemployment pattern. In order to do that we had to make assumptions on the size of the hidden unemployment component which will be in line with the evidence as presented above. However, we want to stress the caution with which these figures should be treated. As there is no 'hard' evidence on the size of this hidden unemployment component, in sharp contrast to the Netherlands and Sweden.

For the construction of the first unmeasured unemployment rate 'u2c' we

have assumed that at the beginning of the sample period (1972-1990), the hidden unemployment component was 2 percent of the IVB stock (again, we have no hard evidence for this, however the evidence above, suggests that there was no real hidden unemployment problem in the seventies, but that it arose in the eighties with the unemployment explosion). Afterwards, we trend this number with the rise in unemployment. With a notable exception. If unemployment is falling, the years 1973-1974, 1978-1979, and 1987-1990, we assume the correction factor to be constant at level of the previous observation. As we have seen, the number of IVB recipients kept on rising when unemployment fell substantially at the end of the eighties. Apparently, the causal 'unemployment-IVB receipt' relationship broke down. The correction factor obtained in this manner has been multiplied with the number of IVB recipients in order to obtain the number of British unmeasured unemployed, 'UU'. The unmeasured unemployment rate 'uu_{2c_{gb}}' and adjusted unemployment rate, 'u_{2cw_{gb}}', were constructed on basis of equations (29.) and (30.):

$$uu = UU/[UU+(U+E)] * 100 \quad (29.)$$

$$uw = [UU+U]/[UU+(U+E)] * 100 \quad (30.)$$

The other unmeasured unemployment rate, 'uux_{gb}', has been constructed by using the trend in the 'UNIVB' series depicted above. Further it was assumed a quarter of those enlisted on IVB whose employment status at the moment of entry is unemployed, are 'unmeasured unemployed'. A pretty strong assumption. Thus, we have taken a quarter of the ratio of 'UNIVB' to 'IVB'. For the period up to 1982

table 20.B. Adjusted British Unemployment Patterns.

Year	u2c(1)	ux(2)	uu2c _{gb} (3)	uux _{gb} (4)	u _{gb} (5)	u2cw _{gb} (6)	uxw _{gb} (7)
1972	.020	.0050	.034	.0085	2.81	2.84	2.82
1973	.020	.0055	.034	.0095	1.96	1.99	1.97
1974	.020	.0060	.035	.010	1.97	2.01	1.98
1975	.023	.0065	.040	.011	3.03	3.07	3.04
1976	.031	.0070	.056	.013	4.14	4.19	4.15
1977	.033	.0075	.063	.014	4.38	4.44	4.40
1978	.033	.0080	.070	.017	4.27	4.34	4.29
1979	.033	.0085	.077	.020	3.96	4.04	3.98
1980	.038	.0090	.091	.022	5.04	5.13	5.06
1981	.061	.0095	.146	.023	8.09	8.23	8.11
1982	.072	.0101	.185	.026	9.53	9.69	9.55
1983	.078	.0404	.210	.109	10.37	10.56	10.46
1984	.080	.0685	.229	.196	10.59	10.79	10.77
1985	.082	.0776	.251	.237	10.87	11.09	11.08
1986	.083	.0861	.265	.275	11.04	11.27	11.28
1987	.084	.0929	.287	.317	9.89	10.14	10.17
1988	.084	.0997	.307	.365	7.92	8.21	8.26
1989	.084	.1034	.329	.404	5.99	6.30	6.37
1990	.084	.1065	.351	.444	5.54	5.87	5.96

Notes on table 20.B.

- Ad.(1) Correction factor, which in times of increasing unemployment follows the unemployment trend (see text).
- Ad.(2) As in Ad.(1). However, it is assumed rises slowly in the seventies and afterwards it follows the trend in the 'UNIVB' figures.
- Ad.(3) unmeasured unemployment rate constructed on basis of 'u2c'.
- Ad.(4) unmeasured unemployment rate constructed on basis of 'ux'.
- Ad.(5) u_{gb}: British unemployment rate, see table 4.A., Ad.(3).
- Ad.(6) u2cw_{gb}: British unemployment rate corrected for hidden unemployment on basis of 'u2c'.
- Ad.(7) uxw_{gb}. As in Ad.(6). The used correction factor was 'ux'.

we have assumed a one half percentage point rise of the correction factor for each year from 1972. In that manner there is no outstanding break in 1981/1982. Again, we have no employment status data for the period before 1982. As stated before, we have no reason to believe (see also the value of UNIVB for 1982) that there was a hidden unemployment problem during the seventies. The massive rise in unemployment occurred in the eighties. All this leads to the correction factor 'ux'. Consequently, we constructed the adjusted unemployment series 'uxw_{gb}'. The figures are depicted in table 20.B.

Although we have to be extremely careful with inferring anything from these figures. One thing is clear. Even if we had assumed that all those enlisted on the IVB program whose employment status is unemployed, could be regarded as hidden unemployed (which is not appropriate if only for the fact that quite a few older than 64 years of age are IVB recipients), the upward impact on the adjusted British unemployment rate would not be quite as impressive as the Dutch figures.

Again, the construction of these series requires some strong assumptions. Nevertheless, the UNIVB series clearly indicates the existence of a British disability problem. Although its size is likely to be significantly smaller than the Dutch disability problems. The constructed unmeasured unemployment series will enable us to test for the possible impact of hidden unemployment on the British *Beveridge curve*. This will be done in the next chapter.

All in all, it seems fair to state that the social security system in the United Kingdom reflects the general attitude of its inhabitants. Benefits are not regarded as a right in the manner the Dutch and the Swedes do. Income provisions by the state are regarded more as a gift than a natural right. The basic provisions

for income support in case of unemployment are available. However, they are less generous than in the two other countries concerned. Also, in case of unemployment there are no extensive labour market programs of the Swedish type.

When a person can prove that his\her financial situation is truly bad, then a wide range of supplementary benefits is available. In general, the British are relatively hesitant to allow their government to provide a reasonable income level, and if they do, they attach all sorts of qualifications to it, thereby, inducing people to work. The British system reflects the attitude of trying to target the help on those who are most in need of it. Whether the British policies are successful in this respect is debatable. The main point is that the character of the British social welfare system does stimulate people to work rather than applying for benefit.

4.5. Disability: an International Comparison.

In the previous sections we have outlined some characteristics of the social welfare systems in the three countries concerned. Although, social welfare arrangements are not the main focus of our study, we had to describe the various arrangements at some length in order to be able to focus on one particular aspect of the social security institutions: the disability pensioning arrangements. More precisely, we are interested in the possible relation between the number of unemployed and the number of people enlisted on disability schemes.

Increases in aggregate unemployment can lead to an increase in the number of beneficiaries on invalidity benefit schemes if the disability benefit is financially more attractive - the duration of the disability benefit is generally far longer than the unemployment benefit provisions - and the disability regulations allow for, or increase in practice, the inflow of those who otherwise would have been regarded as unemployed. When the economy recovers and unemployment rates are in decline, the number of people enlisted on disability schemes remains stable, whereas the inflow into the disability stock might possibly diminish. The partially disabled and the 'unmeasured unemployed' apparently prefer to remain in the financially attractive environment of the disability scheme.

To what extent does the above apply to the three countries concerned? As we have seen in section 4.4., the alleged link between unemployment and disability seems to be applicable to the United Kingdom, in particular for the

beginning of the eighties when the unemployment figures increased sharply. Our feeling is that it is then that the disability problem really started to bite in Great Britain.

Sweden is a more complicated matter. The Swedes have extensive labour market programs for the unemployed, disabled or not. Also, the Swedes have rather generous provision for those who need to apply for benefits. At the same time, they have strict controls on abuse and tough measures for those who do not 'stick to the rules'. The Swedes aim their policies at reemployment rather than income support. In this manner they take away the underlying reason for the 'non-disability' inflow into the disability scheme. There is one exception, in Sweden (unemployed) labourers of sixty years of age and older can retire through the disability pension scheme.

As we have seen, the number of disability beneficiaries in the Netherlands has been connected with the developments in aggregate unemployment. The Dutch have set up a rather generous benefit system, like the Swedes, but without the tight controls and strict measures regarding abuse of the system. Furthermore, like the British, the Dutch have not implemented extensive labour market programs in their economy in order to reduce the demand for benefit support, among other things.

In table 21., we present some characteristics of disability patterns. We have calculated 'disability ratios' for the three countries concerned. A disability ratio is the ratio of the total number of beneficiaries of disability schemes and the number of persons in the labour force. These ratios are not completely correct. Only the partially disabled can be regarded as part of the labour force. Notwithstanding that deficiency, the ratios are a good indicator of the developments as

table 21. Patterns of Disability Ratios.

Year	RD _{nl} (1)	uu _{nl} (2)	RD _{sv} (3)	uu _{sv} (4)	RD _{uk} (5)
1969	.0412	.53	.0462		
1970	.0453	.85	.0478		
1971	.0493	1.12	.0535		
1972	.0540	1.44	.0595	.028	.0166
1973	.0593	1.69	.0654	.065	.0168
1974	.0643	1.89	.0688	.067	.0169
1975	.0697	2.12	.0697	.054	.0170
1976 (*)	.0943	2.38	.0713	.058	.0177
1977 (+)	.1047	2.73	.0618	.062	.0186
1978	.1134	2.96	.0647	.081	.0206
1979	.1194	3.34	.0665	.098	.0227
1980	.1222	3.63	.0679	.132	.0234
1981	.1216	3.56	.0697	.134	.0234
1982	.1231	3.57	.0707	.135	.0250
1983	.1248	3.59	.0718	.173	.0264
1984	.1271	3.64	.0720	.273	.0279
1985	.1291	3.65	.0728	.366	.0299
1986	.1312	3.69	.0741	.371	.0312
1987	.1311	3.69	.0757	.348	.0334
1988	.1310	3.67	.0771	.324	.0358
1989	.1340	3.72	.0781		.0386
1990	.1384	3.77			.0416

Notes on table 20.

- Ad.(*) The introduction in 1976 of the Algemene Arbeidsongeschiktheidswet (AAW) had a significant upward impact on the total number of Dutch disabled persons.
- Ad.(+) The alteration of the retirement age in Sweden (from 67 years to 65 years) had a significant downward effect on the total number of disabled pensioners in Sweden.
- Ad.(1) RD_{nl}: ratio of the number of beneficiaries to the AAW\WAO scheme and the Dutch labour force. Note, until 1975 the figures only include those who were previously employed in the private sector. Source: see table 5.A., Ad.(1), and table 14., Ad.(1) and Ad.(3).
- Ad.(2) uu_{nl}: the Dutch hidden unemployment rate. Source: see table 15., Ad.(1).

- Ad.(3) RD_{sv} : ratio of the total number of Swedish disability pensioners and the Swedish labour force. Source: see table 5.A., Ad.(2), and table 18., Ad.(1).
- Ad.(4) uu_{sv} : the Swedish hidden unemployment rate. Source: see table 19., Ad.(2).
- Ad.(5) RD_{uk} : ratio of the number of IVB recipients in the United Kingdom and the British labour force. Source: Employment Gazette, Department of Employment, July 1971, April 1989, November 1989 and June 1991. Also, see table 20.A., Ad.(3).
-

regards disability in the countries concerned. The British series (RD_{uk}) shows an upward trend. However, the number of IVB recipients is rather modest in comparison to the labour force of the United Kingdom. Hence, the size of RD_{uk} is relative small. Looking at the Swedish series (RD_{sv}) we can see a notable upward shift in the beginning of the seventies, due to relaxing of regulations as regards older pensioners. Until 1975 the Dutch series (RD_{nl} ¹³⁶) is comparable with the Swedish one. However, with the inception of the AAW, the figures go up rapidly, with a value of the disability ratio of approximately .135 at the end of the sample period. The Dutch health service is as good, if not better than anywhere else, and there is no reason to believe that the Dutch suffer from some unidentified persistent disease.

Also incorporated in table 21., are the Dutch and Swedish hidden unemployment series; uu_{nl} and uu_{sv} (we have not reproduced the rather tentative British series). The unmeasured unemployed explain some of the difference between the Dutch and the British and Swedish disability patterns. The difference between the three disability ratios is striking. At least a part of the difference can

¹³⁶ The linkage of uu_{nl} and RD_{nl} is not completely straightforward. RD_{nl} has been computed while using data regarding all the disabled on the AAW\WAO scheme, whereas uu_{nl} has been constructed with data concerning those on the AAW\WAO scheme who were previously employed in the private sector.

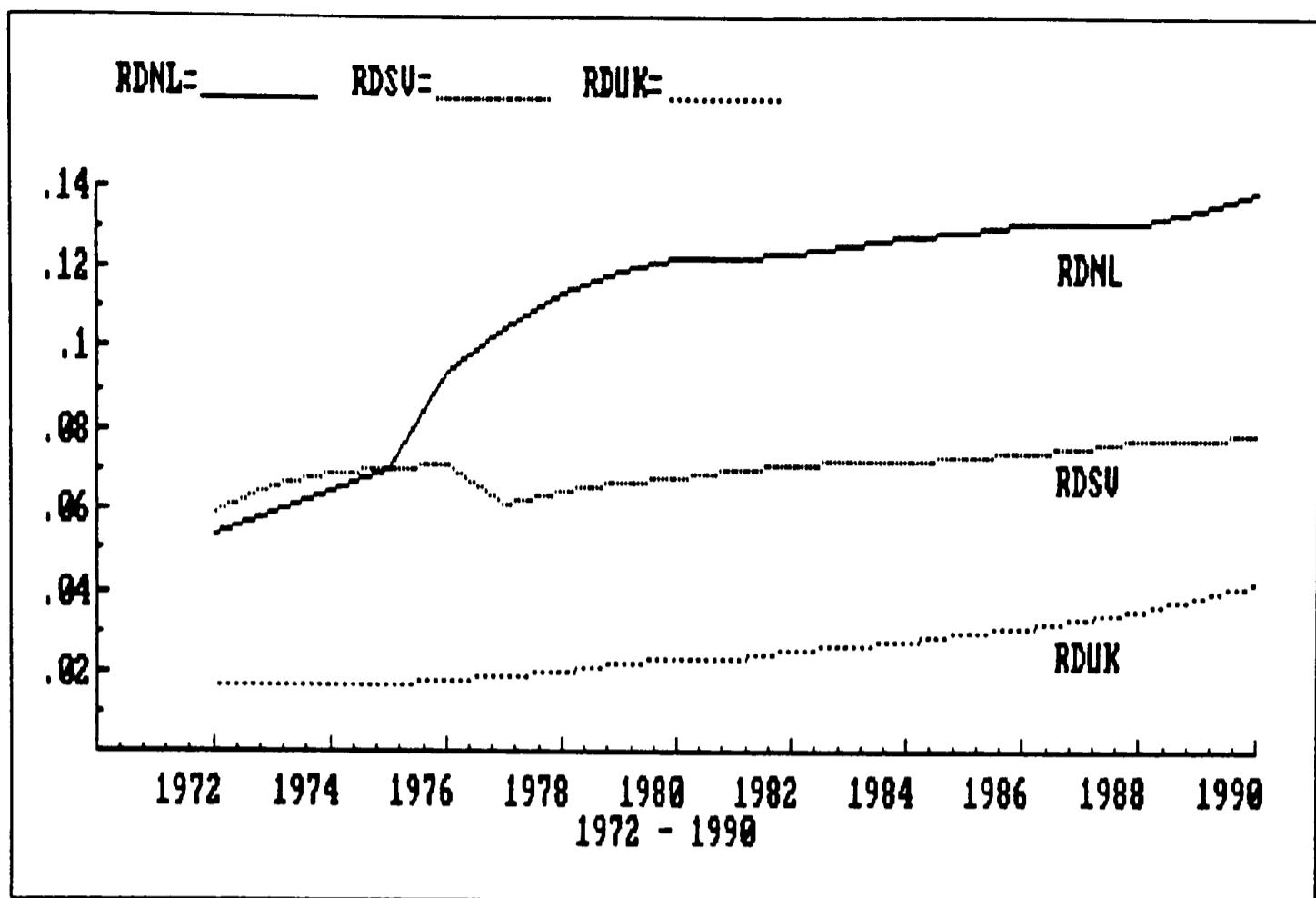


figure 14. British, Dutch and Swedish Disability Ratios.

be explained in terms of the hidden unemployment rate. The Swedish hidden unemployment rate only has marginal values (this also applies to the constructed British rates), whereas the Dutch hidden unemployment rate, especially after 1974, is quite substantial. The figures as depicted in table 21., suggest, to the extent that the computed hidden unemployment rate explains the difference in the patterns of the disability ratios, that the computed Dutch hidden unemployment series is a rather conservative estimate of the work capacity in the Dutch disability stock (see paragraph 4.2.2.). Note, the comparison of the disability ratios with the hidden unemployment series is not completely correct. The denominator of the disability ratios is the labour force, whereas the denominator of the hidden unemployment series is the labour force plus the estimated amount of hidden unemployment in the disability stock, see equation (29.).

All in all, we may conclude that the British and the Swedes are at opposite ends of the spectrum with the Dutch caught somewhere in between. The British have, albeit not that generous, welfare provisions, but they do not have extensive labour market programs. The Swedes, on the other hand, have generous welfare provisions with tight control and extensive spending on labour market programs rather than income support. The Dutch have generous welfare provisions, but not the tight measures nor the extensive labour market programs. Not only is this policy expensive, but it does not seem to be effective either.

The estimated effects of the different social security arrangements on the *Beveridge curves* of the various countries will be discussed in the next chapter.

5. *The Beveridge Curve: Econometric Analysis.*

5.0. *Introduction.*

In the second chapter we set out a model of the *Beveridge curve*. In chapter 3., we described labour market patterns in Great Britain, the Netherlands and Sweden. Furthermore, in chapter 4., we described, and compared the particular institutional arrangements which could affect labour market developments in the three countries concerned.

In this chapter we shall present several model specifications representing the *Beveridge curve* for Great Britain, the Netherlands and Sweden. The econometric tests have been done while applying time series analysis¹.

For estimating the *Beveridge curve* we have used the instrumental variable estimation (IVE) technique rather than Ordinary Least Squares (OLS), because unobserved shocks to the matching process appear in the equation error and may influence vacancies. Also, demand shocks influence vacancies. This makes vacancies endogenous. As regards the long-term unemployment variable these shocks typically have their major impact on long-term unemployment with a lag. Furthermore, generally only lagged long-term unemployment appears in our model specifications and this is a predetermined variable in the absence of serial correlation in the equation error. Thus the case for regarding long-term unemployment as

¹ For an excellent discussion of this discipline see, among others, Harvey (1990).

an endogenous variable is very weak. In any case we will present, as regards the 'core' model specification and our most important model specifications (see the appendix to this chapter), the results of variations in estimation techniques and data in order to check on the robustness of the results. We will refer to these results when discussing the appropriate model specification.

In general, we will focus on the labour market patterns of the last three decades. However, proper data may not be available for the entire sample period, *i.e.* 1960-1990. As regards unemployment, vacancies, mismatch and long-term unemployment, we will use the data presented in chapter 3. In so far as variables regarding the institutional arrangements are used, we refer to the data presented in chapter 4.

Before we turn to the model specifications, we first discuss the characteristics of the data series regarding 'stationarity and cointegration'. In section 5.1., we will present our descriptive analysis of the unemployment and vacancies data.

We will then present the results in a 'countrywise' manner. In section 5.2., we will focus on the Netherlands. Partly, because this section will also contain a description of the various econometric tests performed on all model specifications, it will be longer than the following sections. Section 5.3. will contain the results for Sweden. Finally, in section 5.4., we will present model specifications for Great Britain.

In general, we will first present a 'core' *Beveridge curve* model specification for each country. Afterwards, we will introduce variables which represent labour market features as discussed in chapter two. We will test the significance of structural mismatch, long-term unemployment and the replacement ratio.

Moreover, we will introduce variables representing the hidden unemployment component of the disability stock. Also, we will present evidence on the impact of various British and Dutch labour market policies aimed at reducing the long-term unemployment problem in these two countries. Afterwards, in section 5.5., we present a brief summary of our main findings.

Finally, in the appendix to this chapter, we present several regressions which are presented in order to depict the sensitivity of our results to the chosen method of estimation and various data specifications. These results will be presented for the most important model specifications.

5.1. Stationarity and Cointegration.

Before we start our empirical investigation, it is important to discuss the characteristics of our data series in the context of non-stationarity and cointegration. The main point is that we have to find out whether our data series are stationary, *i.e.* integrated of order nought, $I(0)$. If so, we are allowed to continue with our empirical analysis, all 'orthodox' statistical distributions are valid. However, if our data series are non-stationary, *e.g.* integrated of order one $I(1)$, things are more complicated and we need additional tests to validate our model specifications². As regards the *Beveridge curve* two data series are of immediate interest: the logarithm of the unemployment rate and the logarithm of the vacancy rate. These series are presented in figures 15.A., 15.B., 15.C. (for a detailed description of the patterns of unemployment and vacancies, we refer to chapter 3.). As we can see, the unemployment patterns show, especially for Great Britain and the Netherlands, an intermittent increase over the sample period. On the other hand, the vacancy patterns show, especially for the Netherlands, an interrupted decrease over the sample period. Accordingly, it seems that over the sample period unemployment (Great Britain and the Netherlands), and to a lesser extent vacancies (the Netherlands), are non-stationary. The series seem to have unit roots. We have run unit root tests in order to test these hypotheses. Below, we will present the 'Augmented Dickey-Fuller test

² For a description of the theory of cointegration see, among many others, Engle and Granger (1987), and Hendry (1986). The latter was included in an issue of the Oxford Bulletin of Economics and Statistics completely devoted to cointegration.

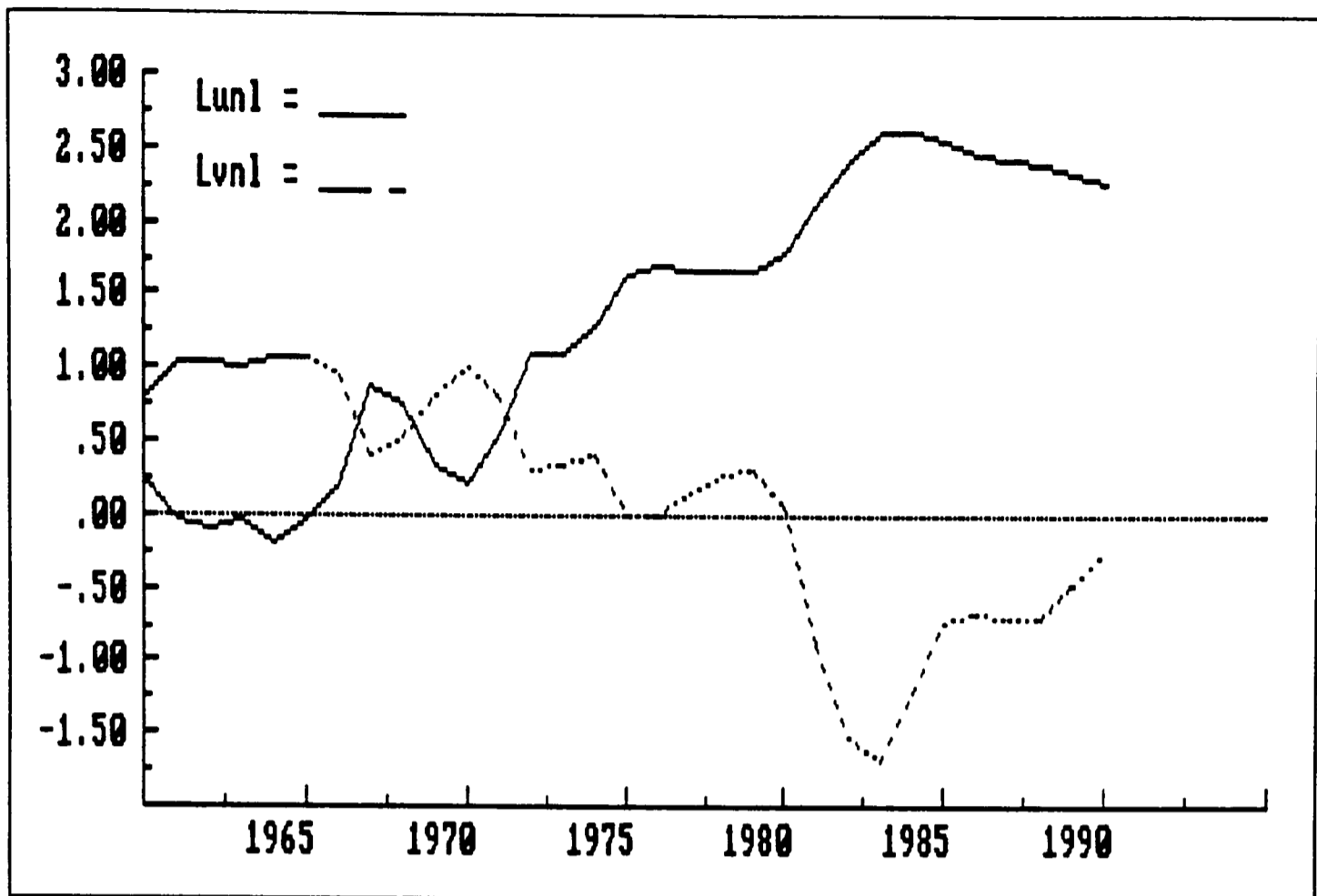


figure 15.A. Dutch Unemployment and Vacancies (logs).

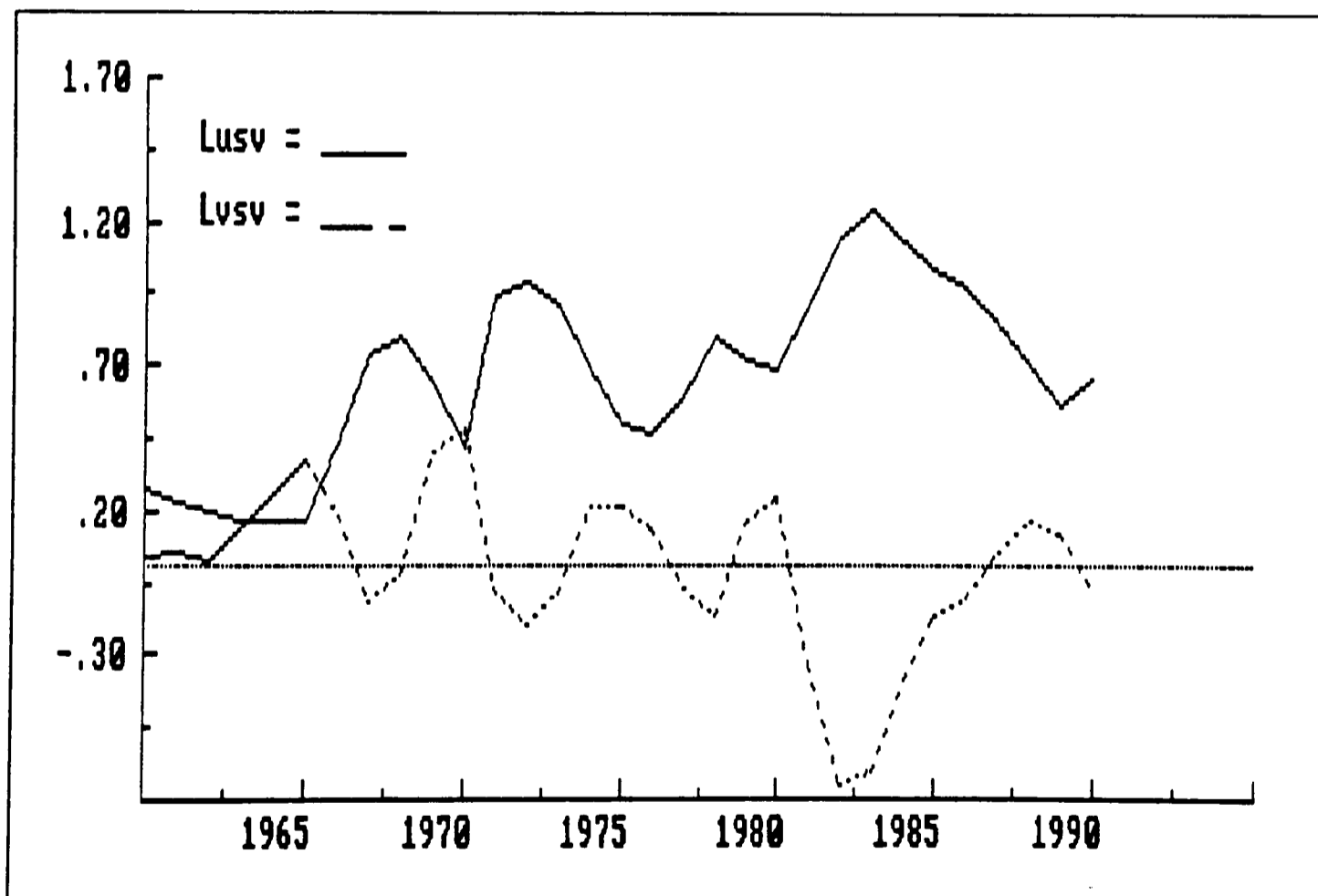


figure 15.B. Swedish Unemployment and Vacancies (logs).

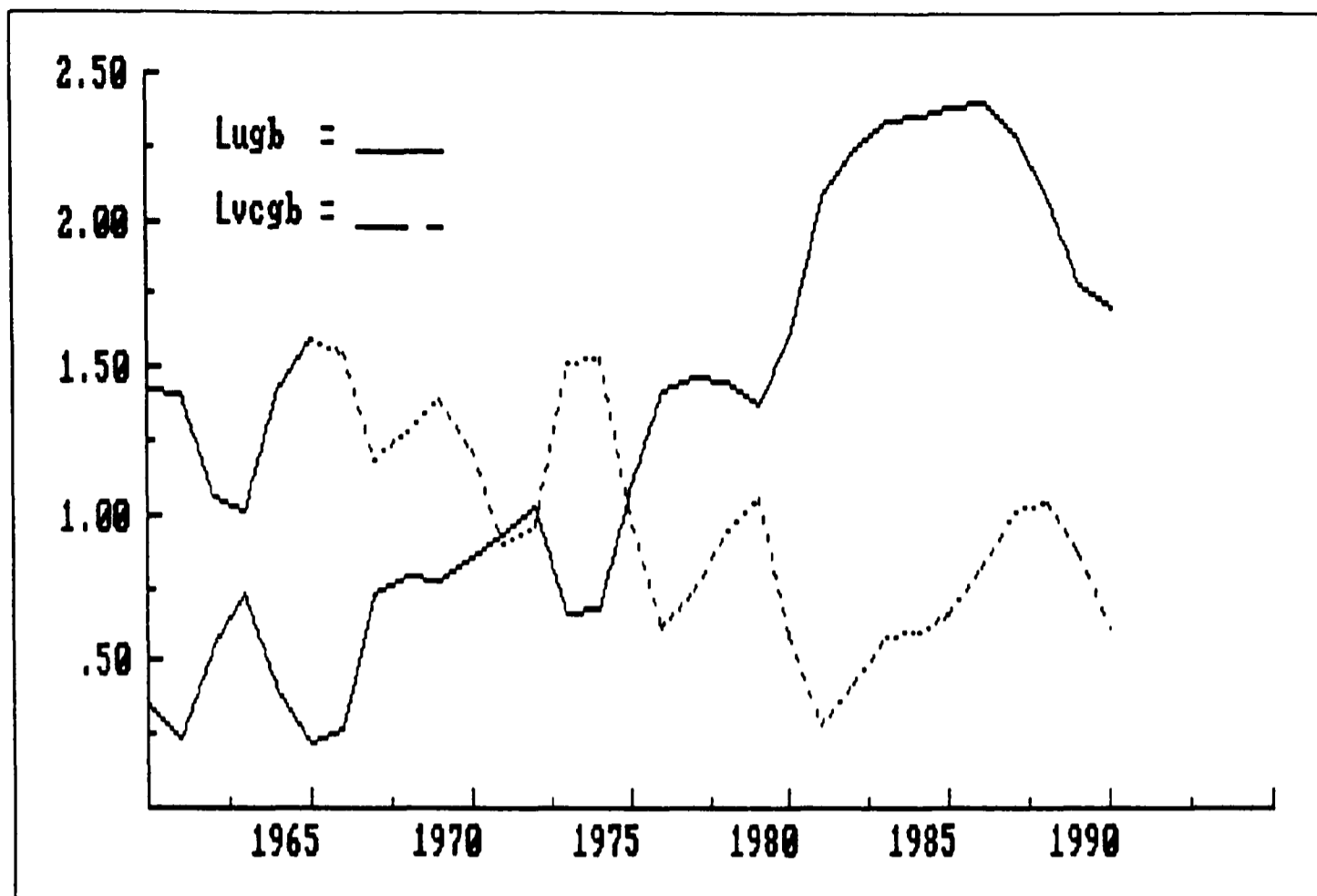


figure 15.C. British Unemployment and Vacancies (logs).

results' (ADF tests) on the series concerned³.

A few explanatory remarks are appropriate⁴. Lu_{nl} denotes the logarithm of the Dutch unemployment rate, whereas Lu_{sv} and Lu_{gb} denote the log of the Swedish and British unemployment rates respectively. Luw_{nl} denotes the adjusted Dutch unemployment rate, whereas $Luwd_{nl}$ represents the adjusted Dutch unemployment rate constructed while using a non-constant hidden unemployment correction factor, 'q' in equation (25.). We refer to paragraph 4.2.2.. Luc_{sv} denotes the corrected, for labour market programs, unemployment rate, whereas $Lucw_{nl}$ denotes the corrected Swedish unemployment rate adjusted for the unmeasured unemployed.

³ For a detailed explanation of these 'unit root tests', see Doornik and Hendry (1992), p. 30 and pp. 111-112. Also, see Harvey (1990), pp. 81-83.

⁴ All the results were obtained while using Pc-Give version 7., see Doornik and Hendry (1992).

Lv_{sv} and Lv_{nl} represent the log of the Swedish and Dutch vacancy rates. Lvc_{nl} denotes the Dutch vacancy series constructed while using CBS-vacancy data for the last decade (see section 3.1.2.). Lv_{gb} represents the British vacancy series and Lvc_{gb} denotes the log of the corrected British vacancy series. $Lvcd_{gb}$ denotes the corrected British vacancy series which has been constructed while using a non-constant vacancy correction factor for the years after 1984 (see, section 3.1.2.). Llu_{nl} represents the first lag of the log of the Dutch unemployment series and DLu_{nl} represents the difference of the log of the Dutch unemployment series. The Swedish and British series are symbolised in the same manner, *e.g.* DLv_{sv} denotes the difference of the log of the Swedish vacancy series. For 'comparative' reasons all unit root tests use the same sample period. Also, the reported Augmented Dickey-Fuller tests, regarding the $I(0)$ tests, all include the first three lags of the differenced series. Although not reported here, ADF tests have been done, including only the first two lags or the first four lags of the 'differenced' series. When necessary we will refer to those test results. In all tests a constant term and a trend are included. In fact omission of these variables from the test specification does not alter the outcome of our inferences in practice.

Before we continue we should emphasize one particular point; the fragility of these unit root tests. We should be careful when interpreting the results of these unit root tests because of their very low power, *i.e.* they tend not to reject the null hypothesis often enough⁵. Also, the relatively small number of observations does not add to the robustness of the results.

Table 22. contains the results of the various ADF tests. The ADF tests

⁵ See Clements and Mizon (1991), especially pp. 894-895.

results regarding the null hypothesis of a unit root for the various unemployment and vacancy series are presented in the second column. We will report the unit root tests for the sample period 1963-1990, thus incorporating three lags of the dependent variable. With regard to the Dutch unemployment series the null hypothesis of a unit root cannot be rejected. The critical significance values are approximately -4.38 at the one percent level and -3.60 at the five percent level⁶. The test results of the ADF test do not give the slightest indication that Lu_{nl} , $Lu_{w_{nl}}$ and $Lu_{wd_{nl}}$ do not have a unit root. The DF test result and the ADF test, as regards the Dutch vacancy series, do lead to the same result; Lv_{nl} and Lvc_{nl} appear to have a unit root.

Turning our attention to the Swedish series, we have to come to the same conclusion. All series, *i.e.* Lu_{sv} , Luc_{sv} , $Lucw_{sv}$ and Lv_{sv} , appear to have unit roots, although the results are slightly more negative than in the Dutch case. It has to be noted that if we extend the sample period to 1962-1990, *i.e.* one more observation, the ADF test result associated with Lv_{sv} is -5.2. Notwithstanding this finding, tests with a slightly different number of observations do not sustain the hypothesis that Lv_{sv} has no unit root. Again, this result does however indicate the fragility of these unit root tests.

Our inferences as regards the British unemployment and vacancies series are not much different. All series seem to be I(1). Again, when we test over the sample period to 1962-1990, there seems to be reason to believe that the corrected British vacancy series (Lvc_{gb}) is not a unit root. However, alternative sample periods do not support this finding. (As we do not use Lv_{gb} in our main British model specifications, we have not presented tests regarding the 'uncorrected' British

⁶ See Harvey (1990), p. 368.

table 22. Unit Root Tests for Unemployment and Vacancies (*).

Variable	ADF-test result	Variable	ADF-test result
Lu_{nl}	-1.493	DLu_{nl}	-4.704
$Lu_{w_{nl}}(1)$	.039	$DLu_{w_{nl}}(1)$	-1.879
$Lu_{wd_{nl}}(1)$	-1.486	$DLu_{wd_{nl}}(1)$	-4.136
Lv_{nl}	-2.015	DLv_{nl}	-4.409
Lvc_{nl}	-0.988	$DLvc_{nl}$	-4.000
Lu_{sv}	-2.052	DLu_{sv}	-4.587
Luc_{sv}	-1.089	$DLuc_{sv}$	-4.693
$Luc_{w_{sv}}(2)$	-1.371	$DLuc_{w_{sv}}(2)$	-3.243
Lv_{sv}	-2.057	DLv_{sv}	-7.061
Lu_{gb}	-1.661	DLu_{gb}	-4.640
Lvc_{gb}	-1.827	$DLvc_{gb}$	-4.166
$Lvcd_{gb}$	-1.739	$DLvcd_{gb}$	-4.183

Ad.(*) Sample period: 1963-1990. The critical values are approximately -4.38 at the one percent level and -3.60 at the five percent level. If the t-value is smaller than the critical value we can reject the null hypothesis of a series having a unit root.

Ad.(1) Sample period: 1972-1990.

Ad.(2) Sample period: 1974-1990.

vacancy series. However, those test results are more or less in the same league).

Furthermore, we have tested for the possibility that the unemployment and vacancy series are integrated of order two. This has been done by performing ADF tests on the series at hand 'differenced once', *e.g.* $DLvc_{gb}$ denotes the difference of the log of the corrected British vacancy series. The fourth column of table 22. contains the results. We have reported the unit root for the sample period 1963-1990, thus incorporating two lags of the dependent variable. The results indicate that we can reject the hypothesis that the unemployment and vacancy series are $I(2)$ at least at the five percent level. However, we cannot reject $I(2)$ as regards Luw_{nl} and $Lucw_{sv}$, but this may very well be due to the lack of a sufficient number of observations (only nineteen and seventeen respectively). Underlining, yet again, the fragility of these unit root tests.

Summarizing, we have to state that the unemployment and vacancies series of all three countries concerned seem to be non-stationary over the sample period, *i.e.* we are confronted by series which have 'local unit roots'.

By the very nature of the series it is clear that thinking of either unemployment or vacancies as having a unit root would probably be mistaken because in the long-run both unemployment and vacancies tend to be tightly bound and to exhibit no trends. However, in the eighties which were included in our relatively short sample period, unemployment has risen sharply and vacancies fallen which gives our short post-war series an ' $I(1)$ look' (*i.e.* vacancies and unemployment

seem to have local unit roots)⁷. However, we intend to capture at least part of this 'shift in the unemployment pattern' by including trends. These deterministic trends capture the influence of unobservable variables on unemployment (*e.g.* changes in attitudes towards 'living off the state' or changes in the unemployment benefit regulations). To see whether this is acceptable we investigate the cointegrating properties of the model specifications below:

$$Lu = \delta \text{ constant} - \gamma Lv \quad (36.a.)$$

$$Lu = \delta \text{ constant} - \gamma Lv + \eta t + \tau t^2 \quad (36.b.)$$

We have run these regressions for all used unemployment and vacancy series. For instance, we have run these two regressions for model specifications incorporating Lu_{nl} and Lv_{nl} . We did it again incorporating Lu_{nl} and Lvc_{nl} , etc. Subsequently, we utilize ADF tests on the residuals of these regressions⁸. A few preliminary remarks are appropriate. We will report the unit root tests on the residuals as regards the sample period 1963-1990, thus incorporating two lags of the dependent variable. The tests have also been run over slightly different sample periods, *i.e.* 1962-1990 and 1964-1990. The results of these tests are not much

⁷ If we re-run the unit root tests for the sample period 1962-1980, we find that all vacancy series are stationary and the unemployment series are considerably closer to the 'threshold' value of rejecting the null hypothesis of a unit root. This despite the fact that the number of observations is very small indeed.

⁸ These regressions, not reported here, do not give reason for expansive elaborations. However, we have to make one point. In all model specifications the DW test result is below 1.00. If time series are integrated of order one the DW test result will approach zero. However, we only have 31 observations and more importantly, autocorrelation, which presence is indicated by the DW test results, does not rule out stationarity!

different. More significantly, in comparison to the unit root tests presented above, we have omitted a trend and a constant term from the test specification. Embodying these variables would not serve any purpose. The residuals do have a zero mean, so including the constant term is not necessary. As a result of the omission of the constant term and the trend, the critical values of the DF test and the ADF test have changed in comparison to the unit root tests presented above⁹.

In table 23., we present the results to which we will now turn. As we can see by looking at the Dutch results, the ADF test results regarding the residuals indicates that the 'non-trend model', equation (36.a.), appears not to be cointegrated, which indicates a structural shift of the Dutch *Beveridge curve*. (The results regarding the residuals for the adjusted unemployment figures are less clear cut. However, the small number of observations available for these regressions makes it difficult give too much value to any inference regarding these results. Again, the fragility of these tests cannot be emphasized enough.) The ADF tests as regards the Dutch residuals of the 'trend model', equation (36.b.), do indicate that these model specifications are clearly cointegrated. Therefore, the shift of the Dutch *Beveridge curve* can be expressed in t and t^2 ; the trends.

The ADF test results as regards the Swedish residuals tell us a rather different story. As we can see, the ADF results regarding the Swedish 'non-trend' residuals indicate that these model specifications are cointegrated, as are the 'trend models'. There appears not to have been a secular shift of the Swedish *Beveridge curve* (we also refer to section 5.3. below).

The results as regards the British residuals are more in line with the

⁹ See Harvey (1990), p. 82 and p. 368.

table 23. Tests on Cointegration (*).

	$Lu = \delta \text{ constant} - \gamma Lv$	$Lu = \delta \text{ constant} - \gamma Lv + \eta t + \tau t^2$
Variable/Residual	ADF-test result	ADF-test result
Lu_{nl}, Lv_{nl}	-1.762	-3.001
Lu_{nl}, Lvc_{nl}	-.875	-4.438
$Lu_{w_{nl}}, Lv_{nl}$ (1)	- 2.080	-3.313
$Lu_{w_{nl}}, Lvc_{nl}$ (1)	-.768	-3.664
$Lu_{d_{nl}}, Lv_{nl}$ (1)	-2.368	-3.760
$Lu_{d_{nl}}, Lvc_{nl}$ (1)	-1.204	-3.543
Lu_{sv}, Lv_{sv}	-2.863	-2.975
Luc_{sv}, Lv_{sv}	-2.766	-2.521
$Luc_{w_{sv}}, Lv_{sv}$ (2)	-2.594	-2.693
Lu_{gb}, Lvc_{gb}	-1.614	-2.701
$Lu_{gb}, Lv_{cd_{gb}}$	-1.383	-2.165

Ad.(*) Sample period: 1963-1990. The critical values are approximately -2.65 at the one percent level and -1.95 at the five percent level. If the t-value is smaller than the critical value we can reject the null hypothesis of a series having a unit root.

Ad.(1) Sample period: 1972-1990.

Ad.(2) Sample period: 1975-1990.

Dutch results. The ADF test results on the 'non-trend models' indicate that this model specification is not cointegrated, pointing to shift of the British *Beveridge curve*. Although the ADF test results regarding the 'trend model' are less negative than the Dutch results, they lead to the conclusion that this model specification appears to be cointegrated. Consequently, it seems justified to express the shift of the British *Beveridge curve* in the trends.

Recapitulating, the unemployment, and to a lesser extent vacancies series of Great Britain, the Netherlands and Sweden seem to have a local unit root, *i.e.* they appear non-stationary over our relatively short sample period which captures the eighties with its sharp upsurge in unemployment and abatement in the number of vacancies, this despite our feeling that in the long-run unemployment and vacancies are stationary series, without an upward or downward trend. However, the part of the variation in unemployment which we will try to explain in the following sections, appears to be $I(0)$, *i.e.* stationary. This we have tested for while taking into account the influence of unobservable variables on unemployment which we have captured by including the deterministic time trends. Because of the stationarity of the unexplained variation of unemployment (the residuals as tested upon above), we will continue our econometric analysis with regressions which are equivalent to 'error correction models'¹⁰, which is perfectly satisfactory. However, as we do not include lags of the vacancies series in the model specifications - for more details we refer to the following sections of this chapter - we will not present our model specifications in error correction form. While using that framework we will try to find variables which have influenced the unemployment patterns in the three

¹⁰ See Davidson et al. (1978).

countries concerned over the last three decades.

5.2. Dutch Model Specifications.

5.2.1. The Dutch Beveridge Curve

In section 3.2., we have described the Dutch unemployment and vacancy series. Also, in figure 4.A., we have depicted the Dutch *Beveridge curve*. The time has come to estimate the Dutch long-run relationship between unemployment and vacancies. We will start this process by regressing vacancies on unemployment, without any other variables apart from the constant term and the deterministic time trends (this, we will call the 'core model specification'), in order to see what the explanatory power of such an exercise is. This practice to go from 'particular to general' model specifications is not in line with the modelling strategy as advocated by some established econometricians¹¹ However, considering each variable in turn is worthwhile because it generates some useful insights. Also, final conclusions are drawn only from the most general model specifications.

In addition to the abbreviations which will be used frequently hereafter, already defined in the previous section, we state that t and t^2 reflect the time trend and time trend squared respectively. Furthermore, as regards the Netherlands, Lv_{nl} is designated as an endogenous variable in the IVE model specifications.

Before we proceed with the estimated Dutch model, it is worth briefly discussing the choice of instruments. Initially, lags of the Dutch vacancy rate series

¹¹ See, among others, Doornik and Hendry (1992), p. 23.

were used as instruments. However, this did not turn out to be very satisfactory. The logarithm of the Dutch vacancy rate in these model specifications was not overwhelmingly significant. Also, test results on the validity of the instruments (specification χ^2) indicated that the choice of instruments was rather poor. The additional use of lags of the mismatch series as instruments did not alter this unsatisfactory outcome. Thus, other instruments had to be sought. The most important partner of the Netherlands in terms of trade is the area which formerly known as the 'Bundesrepublik Deutschland', *i.e.* West-Germany. We have decided to use lagged West-German vacancy data as instruments ($L1v_{ge}$ and $L2v_{ge}$ denote the first and second lag of the log of the West-German vacancy rate¹²). The lagged West-German vacancy series is an almost perfect instrument for estimating the Dutch *Beveridge curve* because i) West-Germany is highly correlated in economic activity with the Netherlands and because of the persistence of the vacancies series it is highly correlated with v_{nl} , and ii) West-German vacancies are not likely to be correlated with the current shocks to the Dutch matching process in the serially correlated error term. However, we will also give examples of model specifications estimated using OLS. These are presented in the appendix to this chapter. We will refer to these results when discussing the appropriate model specification.

We can now consider the Dutch core model specification (throughout the standard errors are reported in parentheses):

¹² As regards the West-German vacancy rate series the sources are: for the years up to and including 1985; ECOSTAT (data-tape), for the years 1986-1990; the Statistisches Bundesamt (1989), p. 92 and p. 106 and Statistisches Bundesamt (1991), p. 116 and p. 130. The West-German labour force data ('erwerbstätigkeit') as published by the Statistisches Bundesamt is adjusted. This to secure the consistency of the used vacancy rate series.

The 'Core' Beveridge Curve for the Netherlands (NL1.).

$$\begin{aligned}
 Lu_{nl} = & \quad .022 \quad +.523 L1u_{nl} \quad -.219 L2u_{nl} \quad +.111 L3u_{nl} \quad -.445 Lv_{nl} \\
 & \quad (.201) \quad (.292) \quad (.258) \quad (.140) \quad (.162) \\
 & \quad +.068 t \quad -.0011 t^2 \\
 & \quad (.018) \quad (.0004)
 \end{aligned}$$

Instruments used: $L1v_{ge}$ and $L2v_{ge}$.

Sample period: 1960-1990.

AR 1-2 F[2,22] = 2.57	AR 1-4 F[4,20] = 1.65
ARCH 1 F[1,22] = .0037	ARCH 4 F[4,16] = .41
χ^2 F[11,12] = 1.52	Normality χ^2 (2) = .076
RSS = .51 , σ = .15	Specification χ^2 = .064

$$\chi^2 (6)/6, \text{ testing } B = 0 : 222.91$$

With the following static long-run equation:

$$\begin{aligned}
 Lu_{nl} = & \quad .038 \quad -.760 Lv_{nl} \quad +.116 t \quad -.0018 t^2 \\
 & \quad (.339) \quad (.175) \quad (.037) \quad (.0010)
 \end{aligned}$$

$$\text{Wald test } \chi^2 (3) = 404.10$$

As regards the core model specification, the best fit is given by including the first three lags on unemployment. $L2u_{nl}$ and $L3u_{nl}$ are not significant. However, omitting these two variables would lead to unacceptable results on the test for autocorrelation (see below). The parameter coefficients of this model do have the correct signs. The coefficient on Lv_{nl} is negative which is theoretically correct. More vacancies are associated with lower unemployment. The positive coefficient on the lagged dependent variable, $L1u_{nl}$, indicates some persistence in Dutch unemployment. The time trends indicate an outward movement of the *Beveridge curve* throughout the sample period which slows towards the end.

We will now discuss the diagnostic test results reported above¹³. The test for autocorrelated residuals is the lagrange-multiplier (LM) test using the F-distribution¹⁴; the AR test as reported above. This test is applied to test the null-hypothesis that there is no autocorrelation. The ARCH test, ie. autoregressive conditional heteroscedasticity, is the LM test for autocorrelated squared residuals. The results do point out that, given the actual model specification, the null-hypothesis of no autocorrelation cannot be rejected. The White test on heteroscedasticity, see the value for χ^2 , leads to an acceptable result. This model specification easily passes the test on normality (χ^2 test). The specification χ^2 test concerns the validity of the chosen instruments. The result points out that there is no problem with the instruments selected, *i.e.* L1v_{ge} and L2v_{ge}. Finally, we report a test on the explanatory power of the regression as regards the variation in the dependent variable: the χ^2 (6)/6, testing $\beta = 0$. With respect to the static long-run equation we report the Wald test. The Wald test entails testing the null-hypothesis that all of the long-run coefficients are zero. However, the standard error of the regression, σ , seems rather high at 15 percent, indicating the low level of explanatory power of the regression.

Including the deterministic time trends contributes a lot to the fit of the model. Omission of the time trends from the model specification leads to unacceptable results for the test on autocorrelation. The results above indicate that there is a lot to improve upon. The explanatory power of the core model specification is

¹³ We will report the same tests for all further model specifications. For a lengthy discussion of the various tests embodied in the Pc-Give 7.0. software package, see Doornik and Hendry (1992), especially chapters two and three.

¹⁴ See, Harvey (1981), pp. 169-177.

rather poor. This conclusion does not change when we look at the 'core' Dutch model specifications presented in table A1., see the appendix to this chapter. We have estimated the 'core' model specification while using OLS and incorporating the Dutch vacancy series based on the CBS-vacancy data for the last decade. Obviously, the coefficients change, but the limited explanatory power of the 'core' model specification is extremely evident. Note, the OLS coefficient on vacancies is systematically smaller in absolute value, indicating the necessity of using IVE methods.

The point is, of course, to find other variables which can explain the behaviour of unemployment, in particular to explain the outward shift in the *Beveridge curve*. Furthermore, it is to be hoped that the incorporation of other variables which can, at least partially, replace the trends, will tend to reduce the residual autocorrelation which mars the estimates of the 'core' *Beveridge curve*. For this purpose, let us recall the 'general' *Beveridge curve* (paragraph 2.4.2.):

$$\log u_t = f_1(\log v_t, l_t, k_t, su_t, sf_t) \quad (19.)$$

Note, l_t denotes the net inflow into the unemployment stock from out of the labour force, k_t represents the inflow rate from employment into unemployment, su_t represents the search intensity of the unemployed and sf_t denotes the choosiness of employers. As we have discussed at length in paragraph 2.4.2., the search intensity of the unemployed could depend on the long-term unemployment experience itself (ltu_t), benefit duration (bd_t), benefit level (b_t) and other variables (xsu_t). It may also depend on variables influencing the behaviour of the unmeas-

ured unemployed (xUU_t). The choosiness of employers may depend on mismatch (mm_t), the long-term unemployment experience of a job-searcher (ltu_t), as on other variables. Thus, we can rewrite the 'general' *Beveridge curve* (section 2.5.):

$$\log u_t = f_3(\log v_t, l_t, k_t, ltu_t, b_t, bd_t, mm_t, xsu_t, xsf_t, xUU_t) \quad (27.a.)$$

and

$$ltu_t = g_3(u_t, bd_t, b_t, mm_t, xltu_t) \quad (27.b.)$$

We will now turn to investigate those variables which we have discussed¹⁵. We will start with the mismatch variable. In paragraph 3.4.1., we have described the pattern of the Dutch occupational mismatch index. This series (mm_{nl}) generally had a higher value in the sixties and seventies than in the eighties. Also, we see that at the beginning of the eighties (1981) the mismatch index does increase, most probably due to the unemployment explosion. However, after that rise the value of the mismatch index reduces to a very low level.

In order to analyze whether or not structural mismatch has a significant influence on the Dutch *Beveridge curve* we regressed unemployment on the log of the Dutch occupational mismatch series (Lmm_{nl}). The results - not reported here - indicated that it could be beneficial to include the difference, and its first lag, of the logarithm of the mismatch index series in the model specification. Consequently:

¹⁵ We will investigate the importance of several variables below. However, we have to state that it is rather difficult to quantify the impact of unemployment benefit duration (bd_t). This should not damage the value of our analysis too much, because the most important time series variability is in the disability area. As far as duration is concerned, the benefit system has been relatively stable over the last three decades. A benefit of some sort will always be available, *i.e.* practically there is indefinite duration of state support in the Netherlands.

Mismatch and the Dutch Beveridge Curve (NL2.).

$$\begin{array}{rcccccc}
 Lu_{nl} = & -.012 & +.786 L1u_{nl} & -.353 L2u_{nl} & -.143 L3u_{nl} & -.430 Lv_{nl} \\
 & (.170) & (.231) & (.236) & (.143) & (.127) \\
 & +.068 t & -.0015 t^2 & +.429 DLmm_{nl} & +.241 DL1mm_{nl} & \\
 & (.021) & (.0008) & (.205) & (.183) &
 \end{array}$$

Instruments used: $L1v_{ge}$ and $L2v_{ge}$.

$DLmm_{nl}$ represents the logarithm of the differenced Dutch occupational mismatch series ($DLmm_{nl} = Lmm_{nl} - L1mm_{nl}$), whereas $DL1mm_{nl}$ represents the first lag of that differenced series.

Sample period: 1960-1987¹⁶.

AR 1-2	F[2,17]	= 1.05	AR 1-4	F[4,15]	= 1.40
ARCH 1	F[1,17]	= .0020	ARCH 4	F[4,11]	= .42
χ^2	F[15, 3]	= .39	Normality	χ^2 (2)	= .037
RSS = .37	, σ	= .14	Specification	χ^2	= 1.05

$$\chi^2 (8)/8, \text{ testing } B = 0 : 161.50$$

With the following static long-run equation:

$$\begin{array}{rcccccc}
 Lu_{nl} = & -.029 & -1.015 Lv_{nl} & +1.011 DLmm_{nl} & +.568 DL1mm_{nl} & \\
 & (.400) & (.402) & (.638) & (.477) & \\
 & +.160 t & -.0036 t^2 & & & \\
 & (.071) & (.0026) & & &
 \end{array}$$

$$\text{Wald-test } \chi^2 (5) = 189.04$$

When we look at equation (NL2.), we see that the signs of the coefficients of $DLmm_{nl}$ and $DL1mm_{nl}$ are positive. The coefficients of the mismatch

¹⁶ Data on the Dutch occupational mismatch series is available from 1957 up to 1987. As from 1988 (we refer to paragraph 3.1.1.), the Dutch Central Bureau of Statistics became the main source for unemployment and vacancy data. The CBS defines different categories as regards occupation as the Dutch employment office, see the notes on table 7., Ad.(1). Therefore, it is impossible to obtain adequate data, *i.e.* consistent with our series, on mismatch for the years 1988, 1989 and 1990. The sample period is adjusted accordingly.

variables have the correct sign, an increase in structural mismatch theoretically leads to an increase in unemployment. Furthermore, we can see that occupational mismatch has indeed a significant short-run impact on the Dutch unemployment pattern (Also, see the static equation). The coefficient of $DLmm_{nl}$ has a t-value exceeding two, thereby stating the significance of the differenced mismatch index series, whereas the t-value as regards the coefficient of $DL1mm_{nl} = 1.32$. The second lag of the differenced mismatch series is insignificant (a test not reported here), which points out that the short-run impact of the mismatch index series lasts approximately two periods, *i.e.* two years. The diagnostic test results regarding autocorrelation and normality are satisfactory. Note, that the second and third lag of the dependent variable are not significant. However, as before, omission of these variables leads to unsatisfactory results as regards the test on autocorrelation.

We have to make an additional point. As stated before, the mismatch index in general had a higher value in the sixties and the seventies than in the eighties. Thus, it is worthwhile investigating whether mismatch is more powerful as regards explaining the Dutch unemployment pattern for the sixties and the seventies. Hence, we present the previous model specification estimated only up to 1980:

Mismatch and the Dutch *Beveridge Curve* 1960-1980 (NL3.).

$$\begin{array}{rcccccc}
 Lu_{nl} = & .795 & +.363 L1u_{nl} & -.142 L2u_{nl} & +.092 L3u_{nl} & -1.077 Lv_{nl} \\
 & (.278) & (.209) & (.148) & (.077) & (.225) \\
 & +.039 t & -.00060 t^2 & +.523 DLmm_{nl} & +.221 DL1mm_{nl} & \\
 & (.021) & (.00095) & (.148) & (.150) &
 \end{array}$$

Instruments used: $L1v_{ge}$ and $L2v_{ge}$.

Sample period: 1960-1980.

AR 1-2 F[2,10] = 2.11
 ARCH 1 F[1,10] = .024
 Normality χ^2 (2) = .43
 Specification χ^2 = .025

AR 1-4 F[4, 8] = 3.02
 ARCH 4 F[4, 4] = .43
 RSS = .053 , σ = .066

χ^2 (8)/8, testing $\beta = 0$: 285.12

With the following static long-run equation:

$$\begin{aligned}
 Lu_{nl} = & \quad 1.157 & -1.568 & Lv_{nl} & \quad +.762 & DLmm_{nl} & +.322 & DL1mm_{nl} \\
 & (.269) & (.260) & & (.311) & & (.256) & \\
 & +.057 & t & & -.00088 & t^2 & & \\
 & (.039) & & & (.00151) & & &
 \end{aligned}$$

Wald-test χ^2 (5) = 758.62

In comparison with the previous model specification we have made one modification. Note, there are not enough observations for calculating the White test on heteroscedasticity. If we include Lmm_{nl} rather than $DLmm_{nl}$ and $DL1mm_{nl}$ in the model specification, it has a t-value of 1.60. This is not completely insignificant, but including the differenced series gives a better fit.

All in all, we have to state that there seems to be some (short-run) impact of structural (occupational) mismatch on the pattern of unemployment in the Netherlands. When we discuss model specification (NL5.), we will return to this issue.

Having tested the effect of the Dutch occupational mismatch series it is time to move on to investigate the role of long-term unemployment in the Dutch *Beveridge curve*. When we recall tables 4.A. and 4.B., and figure 1.A. (see section 3.2.), we can see that at the beginning of the last decade the level of Dutch unemployment began to rise, with only a relatively slight decrease from 1984 onwards.

Also (we refer to table 8. and figure 6.A., paragraph 3.4.2.), there has been an increase in the amount of long-term unemployment¹⁷. The Dutch long-term unemployment ratio started to rise in 1975, but the real upsurge came after 1981.

As we have discussed before at great length (see section 2.4.), the possible impact of the long-term unemployment ratio on the *Beveridge curve* is of theoretical importance. If the long-term unemployment ratio were to be a significant variable with respect to the *Beveridge curve*, we could reject the 'pure heterogeneity' hypothesis. Remember, this hypothesis accommodates the notion that exit probabilities, regarding the unemployment stock, are different for different individuals due to personal characteristics, but constant over time for each individual. Therefore, some persons initially and throughout have fewer chances of finding a job than others. On the other hand, a significant value of long-term unemployment ratio would indicate support for the 'state dependency' or 'duration dependence' hypothesis which contains the notion that the length of the unemployment spell, *i.e.* the chances of leaving the unemployment stock, is influenced by the unemployment experience itself. Note, we will use lags on the variable denoting long-term unemployment to eliminate this simultaneity problem (see section 2.4.). The long-term unemployment ratio can thus be regarded as a proxy for the declined search intensity and search effectiveness of the long-term unemployed. Therefore, a decline in search intensity and search effectiveness can be regarded as a cause of an outward shifting *Beveridge curve*.

Accordingly, the effects of the increased amount of long-term unemploy-

¹⁷ We will return to this point later on (paragraph 5.1.3.) when we discuss the impact Dutch policies designed to reduce long-term unemployment in the Netherlands.

ment on unemployment should be subjected to econometric testing. Loyal to habit we started estimating the impact of the long-term unemployment over the whole sample period, *i.e.* 1960-1990. Unfortunately, the results of this econometric exercise, which is not reported here, were not very positive. Not only was the presence of the long-term unemployment ratio in the model not significant but its coefficient appeared to have the wrong sign as well. The long-term unemployment ratio is expected to have a positive, upwards effect on the pattern of the unemployment rate. This result is therefore extremely unsatisfactory. The answer to this problem can be found in the presented data series, see section 3.4.2., table 8. and figure 6.A.. When we look at the data we see that up to 1965 the long-term unemployment ratio in the Netherlands is extraordinarily high given the level of unemployment. The Dutch long-term unemployment ratio has a value of around .20 in the early sixties, whereas in the early seventies the value of the Dutch long-term unemployment is approximately .05. The reason for this is not entirely clear and leads one to be rather sceptical as to the validity of the Dutch long-term unemployment data for this early period¹⁸. It is therefore worth restricting our estimation to the period after 1964. Consider, the following model specification:

The Impact of the Dutch Long-term Unemployment Ratio (NL4.).

$$\begin{array}{rcccccc}
 Lu_{nl} = & -1.964 & +.515 L1u_{nl} & -.596 L2u_{nl} & -.502 Lv_{nl} & +2.817 lt1_{nl} \\
 & (.730) & (.213) & (.195) & (.121) & (1.193) \\
 & +.278 t & -.0058 t^2 & +.249 DLmm_{nl} & +.237 DL1mm_{nl} & \\
 & (.079) & (.0019) & (.200) & (.172) &
 \end{array}$$

¹⁸ Although appropriate data is not available, the relatively high level of long-term unemployment in that period could, in part, be due to the closure of the Dutch coal mines in the province of Limburg. As a result, there was high unemployment in that region of the Netherlands. Nevertheless, we remain deeply sceptical about the data for the early sixties.

Instruments used: $L1v_{ge}$ and $L2v_{ge}$.

$lt1_{nl}$ denotes the first lag of the Dutch long-term unemployment ratio.

Sample period: 1964-1990¹⁹.

AR 1-2	F[2,16]	=	1.13	AR 1-4	F[4,14]	=	.75
ARCH 1	F[1,16]	=	.47	ARCH 4	F[4,10]	=	.89
χ^2	F[15, 2]	=	.42	Normality	χ^2 (2)	=	.57
RSS = .30	, σ	=	.13	Specification	χ^2	=	.16

χ^2 (8)/8, testing $B = 0$: 155.78

With the following static long-run equation:

$$\begin{aligned}
 Lu_{nl} = & -1.816 & -0.465 & +2.606 & +0.257 & -0.0054 \\
 & (.456) & (.102) & (.803) & (.040) & (.0012) \\
 & +0.231 & & +0.219 & & \\
 & (.203) & & (.171) & &
 \end{aligned}$$

Wald-test χ^2 (6) = 1409.70

Indeed, the coefficient of $lt1_{nl}$ is significant and has the correct sign. It has to be noted that the above regression has also been run while including the long-term unemployment ratio lagged twice or thrice instead of once and a variable reflecting the sum of $lt1_{nl}$ and $lt2_{nl}$. The results (not reported here) as regards $lt2_{nl}$ are rather similar, whereas $lt3_{nl}$ turns out to be insignificant. Including $lt1_{nl}$, also in alternative model specifications, gives the best fit.

As we can see, the simultaneous incorporation of long-term unemployment and occupational mismatch has led to a decreased significance of the differenced occupational mismatch series. Thus, in explaining the Dutch unemployment

¹⁹ Note, due to the sample size, the last three observations for $Dlmm_{nl}$ and the last two for $DL1mm_{nl}$ are noughts. As stated before, there are no reliable figures available for the mismatch series for the years 1988-1990.

pattern over the last two and a half decades, long-term unemployment is far more important than occupational mismatch. Given the short-run character of the mismatch effect and the decreased importance of mismatch in the eighties this is hardly surprising²⁰.

When we look at the diagnostic test results it is clear that the model specification does not suffer from autocorrelation. The other test results are quite satisfactory. In comparison with the previously discussed model specifications, there is a considerable improvement in the explanatory power of the regression. This is reflected by the residual sum of squares (RSS), and the Wald test on the long-run equation.

We will continue our investigation by including a variable representing the Dutch replacement ratio (rr_{nl}). As has been described in section 4.1., the value of the Dutch replacement ratio has increased intermittently from the beginning of the sixties until 1976. Afterwards, there has been an interrupted decline in the value of rr_{nl} until 1987. The model specification below depicts the impact of rr_{nl} on the Dutch *Beveridge curve*:

The Impact of the Dutch Replacement Ratio (NL5.).

$$\begin{array}{rcccccc}
 Lu_{nl} = & -2.629 & +.591 L1u_{nl} & -.705 L2u_{nl} & -.497 Lv_{nl} & +3.868 lt1_{nl} \\
 & (.810) & (.198) & (.214) & (.154) & (1.491) \\
 & +1.199 rr_{nl} & +.254 DL1mm_{nl} & +.252 DLmm_{nl} & +.242 t & -.0052 t^2 \\
 & (.750) & (.218) & (.190) & (.114) & (.0033)
 \end{array}$$

Instruments used: $L1v_{ge}$ and $L2v_{ge}$.

²⁰ We have 'rechecked' the long-run occupational mismatch effect by estimating a model specification including Lmm_{nl} . In this model specification the long-run elasticity of Lmm_{nl} is completely insignificant.

rr_{nl} denotes the Dutch replacement ratio.

Sample period: 1964-1987²¹.

AR 1-2	F[2,12]	= 1.79	AR 1-4	F[4,10]	= 1.27
ARCH 1	F[1,12]	= .026	ARCH 4	F[4, 6]	= .81
Normality	χ^2 (2)	= .62	RSS = .21	, σ	= .14
Specification	χ^2	= .36			

χ^2 (9)/9, testing $\beta = 0$: 134.63

With the following static long-run equation:

$$\begin{aligned}
 Lu_{nl} = & -2.359 & -.446 Lv_{nl} & +3.470 lt1_{nl} & +1.076 rr_{nl} \\
 & (.509) & (.146) & (1.113) & (.643) \\
 & +.217 t & -.0047 t^2 & +.226 DLmm_{nl} & +.228 DL1mm_{nl} \\
 & (.094) & (.0029) & (.187) & (.208)
 \end{aligned}$$

Wald-test χ^2 (7) = 1479.50

As we can see, the diagnostic test results do not give any reason for concern. The coefficient of rr_{nl} has the correct sign. An increase in the replacement ratio which reflects an increase of the relative welfare of the unemployed, is supposed to have an upward effect on aggregate unemployment. Although the coefficient of rr_{nl} is too big to ignore, the Dutch replacement ratio is not strikingly significant. Further evidence as regards this conclusion can be found in table A2.

²¹ We have adjusted the sample size because there are no observations available with regard to rr_{nl} for the years after 1987. Thus, we do not know exactly what has happened to the value of the Dutch replacement ratio in those years. However, we have tested for the impact of rr_{nl} when the observations for the years 1988-1990 are the same as for 1987. We will name this variable the 'extended' Dutch replacement ratio (rre_{nl}). In this case, the t-value of rre_{nl} is about two, but the model specification also suffers from autocorrelation (AR 1-2 F[2,14] = 4.28) which can not be solved by including more lags of the dependent variable. Alternatively, we have tested for the significance of rr_{nl} when we extrapolate the downward trend, since 1977, in the value of rr_{nl} . The t-value of this 'extrapolated' replacement ratio (rre_{nl}) is approximately 2.4, whereas problems as regards autocorrelation do not arise.

presented in the appendix to this chapter. When we estimate the model specification by OLS we find that the Dutch replacement ratio is significant and further evidence for a short-run mismatch effect is depicted as well. However, these findings are not very robust when we reestimate the above while incorporating the adjusted vacancy series (Lvc_{nl}). Both the mismatch variables and the variable denoting the Dutch replacement ratio lose their significance (see columns three and four of table A2.). Casting further doubt on the empirical evidence as regards the importance of mismatch and the replacement ratio when it comes to explaining the Dutch unemployment pattern. The significance of the Dutch long-term unemployment is beyond question. A point we will return to later on, when we discuss model specification (NL7.).

Given the results as reported above, we can conclude that long-term unemployment and, to a far lesser extent, the replacement ratio and occupational mismatch explain some of the shift in the Dutch *Beveridge curve*.

5.2.2. The Unmeasured Unemployed and the Dutch *Beveridge Curve*.

As has been discussed at great length in section 4.2., the character of the Dutch institutional arrangements regarding disability in combination with lenient administrative practices have opened the doors for many people in the Netherlands to a rather attractive disability benefit, without much incentive to return to the official (non-black) labour market.

In order to test the significance of the unmeasured unemployed, and thus the impact of the institutional arrangements we will consider various model specifications. First, we will consider the impact of the huge inflow into the disability stock, for reasons described in paragraph 2.5., on the inflow rate from employment into unemployment, denoted by k_t in equation (19.). The inflow into the Dutch disability stock will most probably have decreased the inflow from employment into unemployment. To investigate this interesting hypothesis, we will use the use the constructed unmeasured unemployed series as described in paragraph 4.2.2. (see table 15.). Therefore, consider the model specification below:

The Impact of the Unmeasured Unemployed (NL6.).

$Lu_{nl} =$	-5.971 (1.130)	+0.365 $L1u_{nl}$ (.154)	-0.547 $L2u_{nl}$ (.205)	-0.367 Lv_{nl} (.093)	+3.130 $lt1_{nl}$ (1.495)
	+0.557 t (.147)	-0.0094 t^2 (.0030)	-0.471 uu_{nl} (.138)	+1.325 rr_{nl} (1.036)	
	+0.174 $DLmm_{nl}$ (.146)		+0.116 $DL1mm_{nl}$ (.124)		

Instruments used: $L1v_{ge}$ and $L2v_{ge}$.

uu_{nl} denotes the hidden unemployment component in the Dutch disability stock.

Sample period: 1969-1987²².

AR 1-2	F[2, 6]	= 1.96	AR 1-4	F[4, 4]	= 1.22
ARCH 1	F[1, 6]	= .0067	ARCH 4	F[4, 0]	= .
Normality	χ^2 (2)	= .28	RSS =	.035 , σ	= .067
Specification	χ^2	= .089			

²² As stated earlier, the WAO was enacted in 1967. Data on the hidden unemployment component in the disability stock is available for the period after 1969. The sample period is adjusted accordingly. Again, we have tested for the significance of rre_{nl} and rrc_{nl} . Both variables have a t-value of approximately one. Also, both model specifications do not suffer from unsatisfactory results as regards the tests on autocorrelation.

χ^2 (10)/10, testing $\beta = 0$: 235.75

With the following static long-run equation:

$$\begin{array}{r}
 Lu_{nl} = \quad -5.052 \quad \quad -.311 Lv_{nl} \quad \quad -.399 uu_{nl} \quad \quad +2.648 lt1_{nl} \quad \quad +1.121 rr_{nl} \\
 \quad \quad (1.135) \quad \quad (.056) \quad \quad (.138) \quad \quad (.891) \quad \quad (.732) \\
 \\
 \quad \quad +.471 t \quad \quad -.0080 t^2 \quad \quad +.147 DLmm_{nl} \quad \quad +.098 DL1mm_{nl} \\
 \quad \quad (.164) \quad \quad (.0031) \quad \quad (.119) \quad \quad (.106)
 \end{array}$$

Wald test χ^2 (8) = 2906.9

The negative sign of the coefficient of uu_{nl} is theoretically correct; the higher the hidden unemployment rate the smaller the inflow rate k_t , and therefore, the smaller the conventional unemployment rate. Another very important result is the unquestionable significance of uu_{nl} ²³, in contrast to rr_{nl} . It seems that the developments as regards the Dutch disability system are of greater significance to the Dutch *Beveridge curve* than the pattern of the Dutch replacement ratio.

As we can see, the diagnostic test results are despite the relatively small number of observations very good. The tests on autocorrelation produce results which are acceptable. Obviously, the two series representing Dutch occupational mismatch are not significant. This is not surprising, as we have pointed out earlier that occupational mismatch appeared to have its short-run impact on the Dutch unemployment pattern, especially in the first two decades of our sample period. Regressions including the hidden unemployment component only make sense if the sample size is shortened to the last two decades of our sample period (again, this is

²³ Also, we have tested for the significance of uu_{nl} lagged once in the model specification. This has been done in order to capture a possible effect of uu_{nl} 'differenced' once on the inflow rate from employment into unemployment. The results indicate however, that including just uu_{nl} gives the best fit.

due to the inception of the Dutch disability laws at the end of the sixties).

Therefore, it should not surprise us that in model specifications of the Dutch *Beveridge curve* including the hidden unemployment component, the occupational mismatch series loses its explanatory power.

Consequently, we will continue with model specification (NL7.), omitting the mismatch terms. We will also omit the less than significant replacement ratio, so that we can run the regression up to 1990. Hence:

Unmeasured Unemployed and the Long-term Unemployment ratio (NL7.).

$$\begin{array}{rcccc}
 Lu_{nl} = & -5.644 & +.296 L1u_{nl} & -.333 L2u_{nl} & -.292 Lv_{nl} \\
 & (.976) & (.141) & (.112) & (.074) \\
 & +.623 t & -.0108 t^2 & +1.445 lt1_{nl} & -.430 uu_{nl} \\
 & (.101) & (.0018) & (.756) & (.126)
 \end{array}$$

Instruments used: $L1v_{ge}$ and $L2v_{ge}$.

Sample period: 1969-1990.

AR 1-2	F[2,12]	=	1.32	AR 1-4	F[4,10]	=	.67
ARCH 1	F[1,12]	=	.10	ARCH 4	F[4, 6]	=	.73
Normality	χ^2 (2)	=	.21	RSS =	.059, σ	=	.065
Specification	χ^2	=	.33				

χ^2 (7)/7, testing $B = 0$: 391.92

With the following long-run equation:

$$\begin{array}{rcccc}
 Lu_{nl} = & -5.443 & -.282 Lv_{nl} & -.415 uu_{nl} & +1.393 lt_{nl} \\
 & (.936) & (.052) & (.129) & (.586) \\
 & +.600 t & -.0104 t^2 & & \\
 & (.093) & (.0015) & &
 \end{array}$$

Wald-test χ^2 (5) = 2705.90

The results, again despite the small number of observations, are rather

good, e.g. see the $\chi^2(7)/7$ test regarding the significance of the regression and the Wald test on the static long-run equation. It has to be noted that the coefficients of the variables in the model specification are not very different from those in the static long-run equation. The hidden unemployment rate has a clear 'inward shifting impact' on the Dutch *Beveridge curve*. Furthermore, the goodness of fit of the estimated model specification is striking. See figure 16.

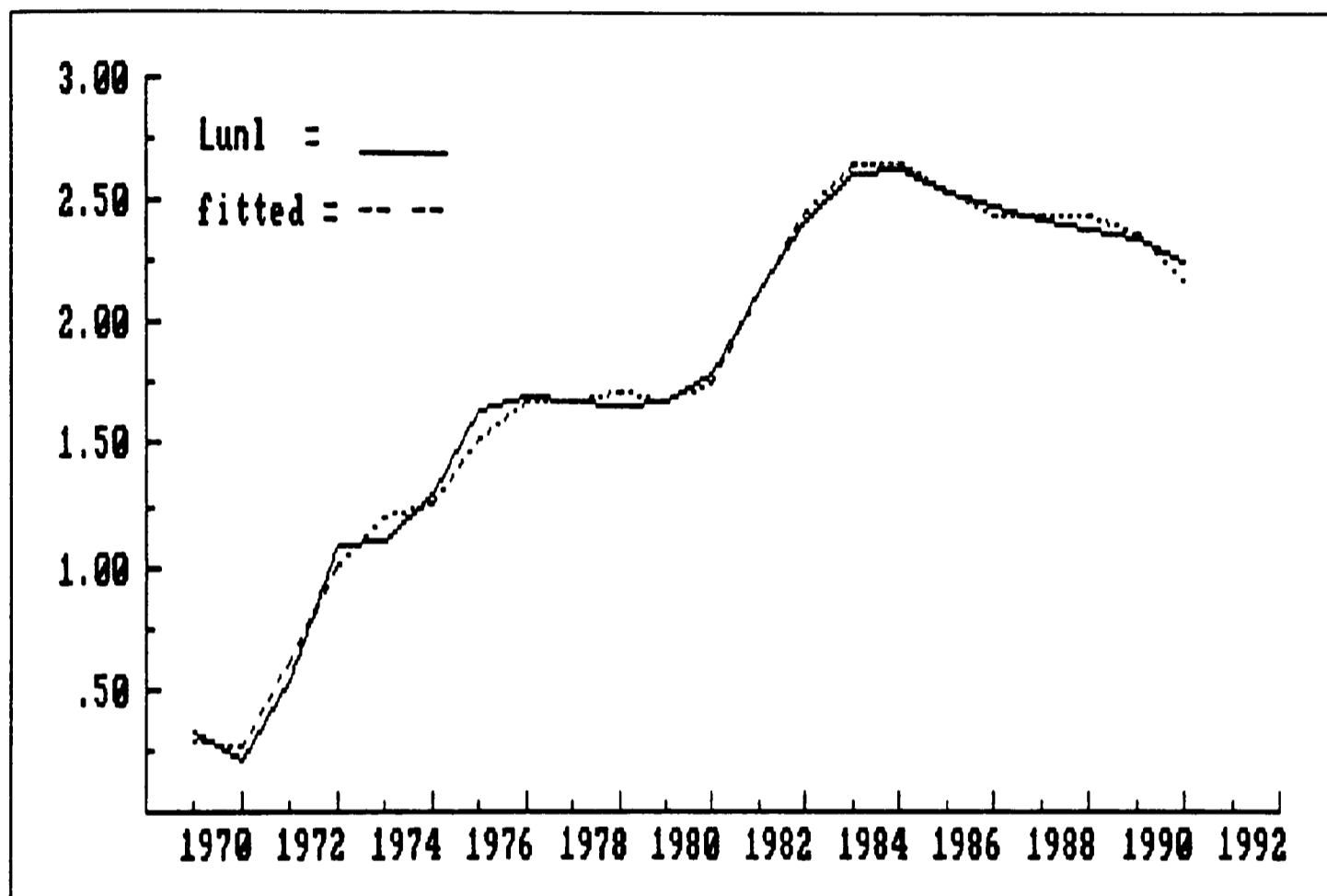


figure 16. Pattern of Dutch Unemployment, Model Specification (NL7.).

All in all, these results stress the significance of both long-term unemployment and the developments regarding the Dutch disability arrangements for the Dutch *Beveridge curve*.

Obviously, this finding, the downward impact of the hidden unemployment rate on the Dutch unemployment, is a notable result. Therefore, it is of crucial importance to check its robustness. Various permutations of estimation techniques and data series have been tested in this context. These are presented in

tables A3.I., A3.II., A3.III. and A3.IV. in the appendix to this chapter. However, because of the importance of unmeasured unemployment to our story, we present a summary of these findings in table 24. below. In comparison with model specification (NL7.), which is presented in the first column, reestimating this model specification by OLS leads to more or less the same result. The significance of the unmeasured unemployment rate is beyond question. The only slight difference is the decreased significance of the Dutch long-term unemployment ratio. However, this is one of the two comparable regressions (out of eighteen) which leads to a t-value on $lt1_{nl}$ which is slightly below two (see the other regressions in table 24. and tables A3.I., A3.II., A3.III. and A3.IV. in the appendix to this chapter). Incorporating the Dutch vacancies series constructed on basis of CBS vacancy data for the last decade (Lvc_{nl}) leads to the same conclusions regarding the impact of both the long-term unemployment ratio and the unmeasured unemployment rate: they are unquestionably significant. Because of the incorporation of Lvc_{nl} the coefficients on both these two variables have increased. The fourth column 'IVE, Lv_{nl} , $uudw_{nl}$ & $uudw1_{nl}$ ' contains the result of a regression which incorporates $uudw_{nl}$ rather than uu_{nl} . We have incorporated $uudw_{nl}$ as an endogenous variable (and its lag as an instrument). We feel that this is acceptable given that shocks to the matching function which affect unemployment may affect the unmeasured unemployment rate as well. This particular unmeasured unemployment rate has been constructed on basis of a correction factor which is correlated with unemployment²⁴ (see section

²⁴ As has been discussed before the validity of constructing an unmeasured unemployment rate with this unemployment trended adjustment factor is debatable. Not in the least due to the fact that it is doubtful whether the number of people enlisted on disability pensions will decrease with a fall, lagged or not, in aggregate unemployment.

table 24. Robustness of Model Specification (NL7.) (*).

Variable	IVE, Lv_{nl} & uu_{nl} (NL7.)	OLS, Lv_{nl} & uu_{nl}	IVE, Lvc_{nl} & uu_{nl}	IVE, Lvc_{nl} , $uudw_{nl}$ & $uudw1_{nl}$ (**)	OLS, Lvc_{nl} , & $uusw_{nl}$
constant	-5.644 (.976)	-5.633 (.938)	-6.417 (1.063)	-4.911 (2.405)	-6.457 (1.493)
$L1u_{nl}$	.296 (.141)	.347 (.170)	.201 (.169)	.296 (.246)	.386 (.137)
$L2u_{nl}$	-.333 (.112)	-.334 (.166)	-.341 (.119)	-.340 (.150)	-.425 (.148)
Lv_{nl}	-.292 (.074)	-.254 (.045)	-.491 (.132)	-.761 (.236)	-.428 (.078)
$lt1_{nl}$	1.445 (.756)	1.192 (.627)	2.846 (1.086)	4.519 (1.709)	2.746 (.876)
uu_{nl} (***)	-.430 (.126)	-.435 (.124)	-.633 (.141)	-.622 (.357)	-.841 (.258)
t	.623 (.101)	.616 (.099)	.718 (.114)	.598 (.265)	.701 (.154)
t^2	-.0108 (.0018)	-.0105 (.0017)	-.0123 (.0021)	-.0109 (.0048)	-.0105 (.0023)
AR 1-2 F[2,12]	1.32	3.18	2.66	.016	.30
ARCH 1 F[1,12]	.10	.35	.0019	3.93	.20
Normality χ^2 Ξ^2	.21	.055	.96	1.03	1.05
RSS	.059	.056	.067	.095	.088
σ	.065	.063	.069	.086	.079
Specification χ^2	.064		.099	.78	
R^2		.995			.993

Ad.(*) Sample period: 1969-1990. The dependent variable is Lu_{nl} . At the beginning of the second column is described what the difference is w.r.t. model specification (NL7.) which is presented in the first column. Thus, 'OLS, Lv_{nl} ' denotes that model specification (NL7.) is reestimated by OLS. The third column shows a regression containing Lvc_{nl} (the Dutch vacancy series constructed on basis of CBS-data for the last decade) rather than Lv_{nl} . The fourth column contains the result of a regression

containing $uudw_{nl}$ (the hidden unemployment rate constructed on basis of a correction factor which followed the unemployment trend for the last decade). In this regression $uudw_{nl}$ is also used as an endogenous variable, whereas its lag is used as an additional instrument. The last column presents the result of a regression incorporating $uusw_{nl}$ (the hidden unemployment rate constructed on basis of a correction factor which kept rising after the beginning of the decline in Dutch unemployment in 1984).

Ad.(**) Sample period: 1970-1990. the sample period is slightly different because of the use of $uudw_{nl}$.

Ad.(***) For the fourth (fifth) column one should read $uudw_{nl}$ ($uusw_{nl}$) rather than uu_{nl} .

4.2.2.). In that manner $uudw_{nl}$ is more sensitive to the patterns of Dutch unemployment than uu_{nl} . Nevertheless, the significance level of $uudw_{nl}$ is approximately the same (a t-value of around three). Also, $uudw_{nl}$ has the correct inward shifting impact on the Dutch *Beveridge curve*. In the last column of table 24., we present a regression incorporating $uusw_{nl}$, an unmeasured unemployment rate constructed on basis of a correction factor which does not decrease when unemployment starts to fall in the mid-eighties (see section 4.2.2.). Given that the numbers on the Dutch disability program did not fall with unemployment, this unmeasured unemployment rate appeals more to us than the previous one ($uudw_{nl}$). As we can see, the significance of both long-term unemployment (with its outward shifting impact on the Dutch *Beveridge curve*) and the unmeasured unemployment rate (with its inward shifting impact on the Dutch *Beveridge curve*) is beyond question (for further details we refer to the appendix to chapter). The diagnostic test results of all equations do not give reason for further elaborations.

All in all, we can say that our findings regarding the significance of the Dutch long-term unemployment ratio and the unmeasured unemployment rate w.r.t.

the Dutch *Beveridge curve* are very robust.

So far, we have proven the significance of the unmeasured unemployed as regards the Dutch *Beveridge curve* while using the model as developed in section 2.5., we refer to equations (27.a.) and (27.b.). We emphasized the fact that the inflow rate has fallen because of the Dutch disability arrangements.

However, as we have stated before, there is no real incentive for those in the disability stock for labour market reasons, to look for another job. Thus, the story of the falling search intensity and search effectiveness of the long-term unemployed could very well apply to the unmeasured unemployed. To investigate this interesting hypothesis we need to adjust the unemployment data. This has been described at length in paragraph 4.2.2. (see table 15.). Hence, we need to include the Dutch hidden unemployment figures in the conventional unemployment rate. Thereby, constructing an unemployment rate corrected for the unmeasured unemployed (series: Luw_{nl}). Moreover, we include the adjusted long-term unemployment ratio (series: $uult_{nl}$, paragraph 4.2.2., see table 16.) in our model specification. This adjusted long-term unemployment consists of those who are unemployed for more than year and those who are designated as unmeasured unemployed. Remember that before enrolment in the WAO scheme one has to have claimed sickness benefit for a year. We will use the adjusted long-term unemployment ratio as a proxy for the decline in search intensity and search effectiveness. In this manner we estimate an 'adjusted' Dutch *Beveridge curve* (We have used $uult12_{nl}$, the sum of the adjusted long-term unemployment ratio lagged once and twice because it gives a better fit than $uult1_{nl}$ or $uult2_{nl}$.). Consider the following model specification:

The Adjusted Dutch Beveridge Curve (NL8.).

$$\begin{aligned} \text{Luw}_{nl} = & \quad -.106 & \quad +.617 \text{L1uw}_{nl} & \quad -.263 \text{Lv}_{nl} & \quad +.829 \text{uult12}_{nl} \\ & (.479) & (.136) & (.047) & (.371) \\ & +.0365 t & -.00116 t^2 & & \\ & (.0599) & (.00086) & & \end{aligned}$$

Instruments used: L1v_{ge} and L2v_{ge} .

Luw_{nl} denotes the logarithm of the adjusted Dutch unemployment-rate, L1uw_{nl} its first lag. uult12_{nl} denotes the sum of the adjusted long-term unemployment ratio lagged once and twice.

Sample period: 1971-1990²⁵.

AR 1-2	F[2,12]	=	.36	AR 1-4	F[4,10]	=	.38
ARCH 1	F[1,12]	=	.013	ARCH 4	F[4, 6]	=	1.19
χ^2	F[9, 4]	=	1.00	Normality	χ^2 (2)	=	.90
RSS =	.033, σ	=	.049	Specification	χ^2	=	.43

$$\chi^2 (5)/5, \text{ testing } \beta = 0 : 419.83$$

With the following static long-run equation:

$$\begin{aligned} \text{Luw}_{nl} = & \quad -.279 & \quad -.687 \text{Lv}_{nl} & \quad +2.167 \text{uult12}_{nl} & \quad +.0955 t & \quad -.00309 t^2 \\ & (1.160) & (.297) & (1.585) & (.1264) & (.00146) \end{aligned}$$

$$\text{Wald test } \chi^2 (4) = 149.48$$

The significance of uult12_{nl} is quite clear. As we can see, the diagnostic test results are quite satisfactory; a very low value for both RSS and σ . The explanatory power of the regression is, in comparison to previously reported Dutch model specifications, very good²⁶. As regards the adjusted Dutch unemployment

²⁵ As stated before, data as regards the otherwise unemployed is available for the period 1969-1990. Incorporating uult12_{nl} in the model specification forces us to adjust the sample size to 1971-1990.

²⁶ As before, we have tested for the significance of rr_{nl} , rre_{nl} and rrc_{nl} . Again, rr_{nl} is not significant: a t-value of around one. A model specification including rre_{nl} again suffers from autocorrelation, but rre_{nl} is definitely significant. As regards a model

pattern, we have also investigated the importance of the replacement ratio and the occupational mismatch index. However, both variables turned out to be insignificant with respect to Luw_{nl} .

The significance of the adjusted long-term unemployment ratio is beyond doubt. The proxy for declined search intensity and search effectiveness ($uult12_{nl}$), proves to be of crucial importance when it comes to explaining the patterns of the adjusted Dutch unemployment rate. Also, the significance of the time trends has decreased. This denotes the explanatory power of including $uult_{nl}$ as regards the pattern of the adjusted Dutch unemployment rate.

All in all, we can state that once we 'correctly' measure unemployment, the shift of the Dutch *Beveridge curve* is almost entirely explained by duration effects and the unexplained features as represented by the trends are of minor importance.

5.2.3. Explaining Dutch Long-term Unemployment.

In chapter 3., we have discussed the patterns of long-term unemployment. Here, we continue our investigation by looking for exogenous variables which could influence the Dutch long-term unemployment ratio, we refer to equation (27.b.).

We have already discussed the impact of the replacement ratio on the Dutch

specification with rrc_{nl} there are no autocorrelation problems, but the t-value of rrc_{nl} is only around 1.7.

unemployment pattern. Its impact on the Dutch long-term unemployment ratio will be presented at the end of this paragraph. Also, as stated before, changes in benefit duration regulations are difficult to quantify. But, as we have stated before, there have not been dramatic changes in the Dutch welfare system as far as benefit duration is concerned.

Therefore, while looking for variables explaining the pattern of $l_{t,nl}$, we should focus on the impact of Dutch labour market policies aimed especially at the reduction of long-term unemployment. But first we shall report a model specification containing only, apart from the trends, the lagged dependent variable and (lags of) the unemployment rate. It is expected that an increase in aggregate unemployment will reduce the long-term unemployment ratio in the short-run. This is because the increase is associated with a rise in the inflow and hence an increase in the proportion of short-term unemployed. However, in the long-run we expect the proportion of long-term unemployed to rise. We shall use Ordinary Least Squares (OLS), because appropriate instruments are not as obvious as in the case of *Beveridge curve* estimation. As regards OLS the HCSE, heteroscedasticity corrected standard error, will be reported in the parentheses. The value of this should be more or less the same as the standard error, otherwise it would indicate the presence of heteroscedasticity²⁷. We also report the values of three 'information criteria': the Schwarz criterion (SC), the Hannan-Quinn criterion (HQ) and the final prediction error (FPE)²⁸. Let us proceed with presenting the next model specification:

²⁷ See Doornik and Hendry (1992), pp. 31-32.

²⁸ See Judge et al. (1985), pp. 243-247.

Dutch Long-term Unemployment (LTNL1.).

$$\begin{array}{rcccccc}
 lt_{nl} = & .156 & -.018 u_{nl} & +.066 u1_{nl} & -.053 u2_{nl} & +.017 u3_{nl} \\
 & (.075) & (.004) & (.007) & (.013) & (.008) \\
 & & & & & \\
 & -.0165 t & +.00050 t^2 & +.468 lt1_{nl} & & \\
 & (.0077) & (.00021) & (.152) & &
 \end{array}$$

u_{nl} denotes the Dutch unemployment rate. $u1_{nl}$, $u2_{nl}$ and $u3_{nl}$ denote the first, second and third lag of the Dutch unemployment respectively.

Sample period: 1964-1990.

AR 1-2	F[2,17]	=	.24	AR 1-4	F[4,15]	=	1.03
ARCH 1	F[1,17]	=	.65	ARCH 4	F[4,11]	=	.89
χ^2	F[13, 5]	=	.10	Normality	χ^2 (2)	=	1.63
RSS =	.0082, σ	=	.021	$R^2 =$	.99, \underline{R}^2	=	.83
SC =	-7.12, HQ	=	-7.39	FPE		=	.00056

With the following static long-run equation:

$$\begin{array}{rcccc}
 lt_{nl} = & .292 & +.022 u_{nl} & -.0310 t & +.00093 t^2 \\
 & (.079) & (.009) & (.0081) & (.00023)
 \end{array}$$

Wald test χ^2 (3) = 200.79

As we can see, there is some persistence in Dutch long-term unemployment (the significance of $lt1_{nl}$). Also, the unemployment rate, u_{nl} and its first three lags, are quite important when it comes to explaining the pattern of the Dutch long-term unemployment ratio. The diagnostic tests need no further comment.

It is time to move on to investigating the impact of the implementation of the various Dutch labour market policies which have been aimed at reducing unemployment and long-term unemployment in particular. We have discussed these programs in section 3.4. As we have seen, the programs aimed at the reduction of long-term unemployment, notably 'wage cost subsidies' for employers who take on persons who have been out of a job for more than one year, have taken effect since

1984. We start our investigation on the impact of the 'wage-cost subsidies' by running a regression containing pulse dummies for the years 1984 and after. This is done simply to see if there are any systematic negative shifts in the constant term after the relevant date. Later on we will include regressors which measure directly the impact of wage cost subsidies programs on the Dutch long-term unemployment pattern for the years 1984 and after. Consider model specification (LTNL2.):

lt_{nl} and 'Equal Coefficients' (LTNL2.).

$lt_{nl} =$	.233 (.143)	-.022 u_{nl} (.008)	+.069 $u1_{nl}$ (.007)	-.031 $u2_{nl}$ (.019)	-.016 $u3_{nl}$ (.013)
	-.0243 t (.0160)	+.00056 t^2 (.00053)	+.281 $lt1_{nl}$ (.189)	-.086 w84 (.021)	-.140 w85 (.038)
	-.109 w86 (.046)	-.087 w87 (.052)	-.019 w88 (.062)	-.041 w89 (.072)	-.026 w90 (.097)

w84, w85, w86, w87, w88, w89 and w90 denote pulse dummies with the value 0 during the whole sample period except for the year they represent. In that particular year the dummy takes value 1. So, w84 takes value 1 for the year 1984 and 0 for all other years, etc.

Sample period: 1964-1990.

AR 1-2 F[2,10] = .81	AR 1-4 F[4, 8] = .35
ARCH 1 F[1,10] = .21	ARCH 4 F[4, 4] = .064
Normality $\chi^2(2) = 3.00$	RSS= .0031, $\sigma = .016$
$R^2 = .996$, $\underline{R}^2 = .94$	SC = -7.25 , HQ = -7.75
FPE = .00040	

With the following static long-run equation:

$lt_{nl} =$	.324 (.094)	+.045 u_{nl} (.020)	-.0338 t (.0115)	+.00078 t^2 (.00050)	-.120 w84 (.057)
	-.194 w85 (.066)	-.152 w86 (.061)	-.121 w87 (.059)	-.026 w88 (.075)	-.058 w89 (.077)
	-.036 w90 (.111)				

Wald test $\chi^2 (10) = 733.50$

The coefficients of the first four pulse dummies (w84, w85, w86 and w87) are more or less in the same league. The coefficients of the other dummies, *i.e.* w88, w89 and w90, are rather smaller. Also, given the t-values on the last three dummies it seems that the programs lose their dampening effect on long-term unemployment in the last three years of the sample period. Remember that the Dutch long-term unemployment ratio, which rose to a level of about 42 percent in 1984 and remained at that level until 1987, started increasing again in 1988 (see table 8, and figure 6.A.).

To quantify the presence of the wage cost subsidies program, we will now present model specification (LTNL3.) which contains an index of the amount spent on these wage cost subsidies per unemployed person related to the average wage for the years 1984-1990 (SLP). We refer to our discussion in section 3.4., and especially to table 9.A. which contains data on the wage subsidies index. In this manner we investigate the impact of the number of guilders spent on the long-term unemployment problem. Hence, consider the following model specification:

lt_{nl} and Wage Cost Subsidies (LTNL3.).

$lt_{nl} =$	.279 (.096)	-.027 u_{nl} (.006)	+.070 $u1_{nl}$ (.008)	-.043 $u2_{nl}$ (.014)	+.008 $u3_{nl}$ (.009)
	-.0311 t (.0103)	+.00101 t^2 (.00032)	+.305 $lt1_{nl}$ (.176)	-.00045 SLP (.00022)	

SLP denotes an index of the amount spend per unemployed person related to the average annual wage for the years 1984-1990 (0 up to 1984).

Sample period: 1964-1990.

AR 1-2	F[2,16]	=	.086	AR 1-4	F[4,14]	=	.47
ARCH 1	F[1,16]	=	.34	ARCH 4	F[4,10]	=	.46
χ^2	F[15, 2]	=	.19	Normality	$\chi^2 (2)$	=	.48
RSS =	.0068, σ	=	.019	$R^2 =$	.990, \underline{R}^2	=	.86
SC =	-7.18, HQ	=	-7.49	FPE		=	.00051

With the following static long-run equation:

$$lt_{nl} = .401 + .011 u_{nl} - .0447 t + .00145 t^2 - .00065 SLP$$

(.063)
(.007)
(.0075)
(.00026)
(.00032)

Wald test $\chi^2 (4) = 417.00$

As we can see, the Dutch efforts seem to have had a significant downward (the negative sign of the coefficient on the SLP variable) impact on the pattern of the long-term unemployment ratio. In light of the results presented with model specification (LTNL2.) we now present model specification (LTNL4.). This model specification incorporates two variables reflecting the impact of the Dutch effort to diminish the long-term unemployment burden. The index is now divided in two components: one variable (SLP8487) denoting the index for the years 1984-1987, the other (SLP8890) for the years 1988-1990. Consequently:

lt_{nl} and the 'Broken' Wage Cost Subsidies Index (LTNL4.).

$$lt_{nl} = .202 + .371 lt1_{nl} - .0214 t + .00057 t^2$$

(.097)
(.150)
(.0109)
(.00039)

$$- .021 u_{nl} + .072 u1_{nl} - .048 u2_{nl} + .019 u3_{nl}$$

(.006)
(.007)
(.015)
(.011)

$$- .00070 SLP8487 - .00013 SLP8890$$

(.00026)
(.00028)

SLP8487 denotes an index of the amount spend per unemployed person related to the average annual wage for the years 1984-1990 (0 up to 1984, and after 1987). SLP8890 denotes the same variable but only for the years 1988-1990 (0 for the years up to 1988).

Sample period: 1964-1990.

AR 1-2	F[2,15]	=	.98	AR 1-4	F[4,13]	=	.55		
ARCH 1	F[1,15]	=	1.11	ARCH 4	F[4, 9]	=	.30		
Normality	χ^2 (2)	=	.37	RSS	=	.0059, σ	=	.019	
R^2	=	.992, \underline{R}^2	=	.88	SC	=	-7.21, HQ	=	-7.54
FPE	=	.00047							

With the following static long-run equation:

lt_{nl}	=	.321	+ .034 u_{nl}	- .0340 t	+ .00091 t^2
		(.096)	(.019)	(.0118)	(.00050)
		- .00112 SLP8487		- .00021 SLP8890	
		(.00051)		(.00045)	

Wald test χ^2 (5) = 385.71

The results point out that the Dutch 'wage cost subsidies' programs appear to have had a significant downward effect on the long-term unemployment ratio for the years 1984-1987. Despite the increase in spending on these programs in the years 1989 and 1990, their effect seems to have fallen. The index for the years 1988-1990 is clearly insignificant. The diagnostic test results for a model specification omitting SLP8890 - a test not reported here - are, as is to be expected, even better. Finally, a regression which also includes the Dutch replacement ratio:

lt_{nl} and the Replacement Ratio (LTNL5.).

lt_{nl}	=	.236	+ .348 $lt1_{nl}$	- .0401 t	+ .00114 t^2
		(.104)	(.179)	(.0153)	(.00050)
		- .026 u_{nl}	+ .072 $u1_{nl}$	- .044 $u2_{nl}$	+ .012 $u3_{nl}$
		(.007)	(.009)	(.015)	(.011)
		+ .160 rr_{nl}	- .00058 SLP8487		
		(.078)	(.00026)		

Sample period: 1964-1987.

AR 1-2	F[2,12]	= 1.92	AR 1-4	F[4,10]	= 1.39
ARCH 1	F[1,12]	= .25	ARCH 4	F[4, 6]	= .30
Normality	$\chi^2 (2)$	= .44	RSS =	.0043, σ	= .018
$R^2 =$	.990, \underline{R}^2	= .90	SC =	-7.30, HQ	= -7.66
FPE		= .00044			

With the following static long-run equation:

$$\begin{aligned}
 lt_{nl} = & \quad .362 \quad +.021 u_{nl} \quad -.0615 t \quad +.00175 t^2 \\
 & \quad (.085) \quad (.017) \quad (.0163) \quad (.00054) \\
 & \quad +.245 rr_{nl} \quad -.00089 SLP8487 \\
 & \quad (.157) \quad (.00055)
 \end{aligned}$$

Wald test $\chi^2 (5) = 260.90$

As a result of the adjusted sample period, see the discussion in the section 3.1.²⁹, we have excluded SLP8890 from the model specification. In contrast with the model specifications concerning Lu_{nl} , rr_{nl} is now unambiguously significant. Its coefficient has the correct sign, an increase in the financial position of the unemployed theoretically leads to an increase in the number of (long-term) unemployed. In comparison to the previous model specification the t-value of SLP8487 has declined, but SLP8487 is still significant. It appears that the Dutch replacement ratio is of importance when it comes to explaining the pattern of the Dutch long-term unemployment ratio. We have also investigated the impact of the Dutch occupational mismatch series on lt_{nl} . The mismatch index turns out to be completely insignificant, when it comes to explaining long-term unemployment in the Netherlands.

²⁹ Again, we have also tested for the significance of rre_{nl} and rrc_{nl} . The significance of rre_{nl} is comparable to the significance of rr_{nl} in model specification (LTNL5.), whereas rrc_{nl} is slightly less significant. Problems as regards autocorrelation do not arise in these model specifications.

The econometric exercise as reported above can also be applied to the adjusted long-term unemployment ratio (see section 4.2.2.). As before, we start the proceedings by reporting a model specification including the lagged dependent variable and (lags of) the adjusted unemployment rate. Consider the following model specification:

The Dutch Adjusted Long-term Unemployment (UULTNL1.).

$$\begin{aligned}
 uult_{nl} = & \quad .093 & \quad -.041 uw_{nl} & \quad +.070 uw1_{nl} & \quad -.055 uw2_{nl} & \quad +.020 uw3_{nl} \\
 & (.167) & (.009) & (.017) & (.018) & (.010) \\
 & +.0208 t & -.00010 t^2 & +.444 uult1_{nl} & -.397 uult2_{nl} \\
 & (.0116) & (.00022) & (.201) & (.186)
 \end{aligned}$$

uw_{nl} denotes the adjusted Dutch unemployment rate. $uw1_{nl}$, $uw2_{nl}$ and $uw3_{nl}$ denote the first, second and third lag of the Dutch unemployment respectively. $uult1_{nl}$ and $uult2_{nl}$ denote the first and second lag of the adjusted Dutch long-term unemployment ratio $uult_{nl}$.

Sample period: 1972-1990³⁰.

AR 1-2	F[2, 8]	= .47	AR 1-4	F[4, 6]	= 2.73
ARCH 1	F[1, 8]	= 1.03	ARCH 4	F[4, 2]	= .12
Normality	χ^2 (2)	= .64	RSS =	.0037, σ	= .019
$R^2 =$	.98, \underline{R}^2	= .84	SC =	-7.13, HQ	= -7.50
FPE		= .00055			

With the following static long-run equation:

$$\begin{aligned}
 uult_{nl} = & \quad .097 & \quad -.006 uw_{nl} & \quad -.0219 t & \quad +.00100 t^2 \\
 & (.177) & (.005) & (.0152) & (.00023)
 \end{aligned}$$

$$\text{Wald test } \chi^2 (3) = 132.08$$

Apart from the negative sign, and its insignificance on uw_{nl} in the static long-run equation, there is no reason for further comment. By analogy with model

³⁰ As stated before, we have data on the unmeasured unemployed for 1969 and after. As a result of the incorporation of $uw3_{nl}$ the sample period becomes 1972-1990.

specification (LTNL2.) we carry on with including a pulse dummy for each year after 1983:

uult_{nl} and 'Equal Coefficients' (UULTNL2.).

$uult_{nl} =$	2.776 (1.345)	-.068 uw _{nl} (.009)	+.013 uw1 _{nl} (.024)	-.027 uw2 _{nl} (.032)	+.036 uw3 _{nl} (.041)
	-.1905 t (.0917)	+.00509 t ² (.00278)	-.878 uult1 _{nl} (.504)	-.357 uult2 _{nl} (.666)	-.149 w84 (.025)
	-.423 w85 (.107)	-.635 w86 (.240)	-.728 w87 (.333)	-.737 w88 (.360)	-.802 w89 (.377)
	-.929 w90 (.419)				

Sample period: 1972-1990.

AR 1-2 F[2, 1] = 1.88
 ARCH 1 F[1, 1] = .20
 Normality χ^2 (2) = .92
 $R^2 = .9991$, $\underline{R}^2 = .99$
 FPE = .000084

AR 1-4 F[4,] = .
 ARCH 4 F[4,] = .
 RSS = .00014, $\sigma = .0067$
 HQ = -10.02 , SC = -9.36

With the following static long-run equation:

$uult_{nl} =$	1.241 (.094)	-.004 uw _{nl} (.007)	-.0852 t (.0085)	+.00228 t ² (.00016)	-.067 w84 (.031)
	-.189 w85 (.060)	-.284 w86 (.054)	-.325 w87 (.032)	-.330 w88 (.025)	-.359 w89 (.025)
	-.415 w90 (.032)				

Wald test χ^2 (10) = 6116.60

The results are rather different from those presented with model specification (LTNL2.). First of all, the introduction of the pulse dummies has taken away the significance of the lagged dependent variables and the lags of the adjusted

unemployment rate. Also, all pulse dummies are now significant. Moreover, in contrast to the results as regards lt_{nl} , see model specification (LTNL2.), we cannot say that the pulse dummies for the first four years have more or less the same coefficient. The results above do indicate that the pulse dummies for the last five years of the sample period have approximately the same value.

In line with the procedure followed above, we continue with presenting a model specification which incorporates the variable quantifying the Dutch wage cost subsidies (SLP) for the period we have included pulse dummies in the previous regression:

$uult_{nl}$ and Wage Cost Subsidies (UULTNL3.).

$uult_{nl} =$	.167 (.179)	-.047 uw_{nl} (.009)	+.075 $uw1_{nl}$ (.017)	-.050 $uw2_{nl}$ (.018)	+.012 $uw3_{nl}$ (.010)
	+.0108 t (.0161)	+.00022 t^2 (.00038)	+.422 $uult1_{nl}$ (.202)	-.322 $uult2_{nl}$ (.168)	-.00035 SLP (.00029)

Sample period: 1972-1990.

AR 1-2 F[2, 7] = .49	AR 1-4 F[4, 5] = 3.70
ARCH 1 F[1, 7] = .65	ARCH 4 F[4, 1] = .15
Normality χ^2 (2) = .65	RSS = .0032, σ = .019
$R^2 = .98$, $\underline{R}^2 = .87$	SC = -7.15 , HQ = -7.56
FPE = .00054	

With the following static long-run equation:

$uult_{nl} =$.185 (.189)	-.011 uw_{nl} (.007)	+.0120 t (.0168)	+.00024 t^2 (.00037)	-.00039 SLP (.00033)
---------------	----------------	---------------------------	---------------------	---------------------------	-------------------------

Wald test χ^2 (4) = 126.80

Obviously, the impact of the wage cost subsidies on the adjusted long-term unemployment ratio is less significant as regards the unadjusted long-term

unemployment ratio. For a comparison, see the results presented with model specification (LTNL4). This result which, given the significance of all the pulse dummies in the previous model specification, is not completely expected. However, since the wage cost subsidies were aimed at the long-term unemployed alone, it is not surprising that SLP is not significant as regards the pattern of the adjusted long-term unemployment ratio for the whole sample period. The subsidies were not aimed at the reduction of the number of unmeasured unemployed in the disability stock; the other component of the adjusted long-term unemployment ratio. We finish our investigation regarding importance of the wage cost subsidies by presenting a model specification which includes two variables representing the programs aimed at reducing Dutch long-term unemployment. Consequently, consider model specification (UULTNL4.):

uult_{nl} and the 'Broken' Wage Cost Subsidies Index (UULTNL4.).

uult _{nl} =	.193 (.156)	-.044 uw _{nl} (.012)	+.079 uw1 _{nl} (.017)	-.056 uw2 _{nl} (.018)	+.023 uw3 _{nl} (.015)
	+0.0094 t (.0145)	+0.00004 t ² (.00045)	+0.487 uult1 _{nl} (.198)	-.357 uult2 _{nl} (.183)	
		-.00049 SLP8487 (.00025)		-.00012 SLP8890 (.00044)	

Sample period: 1972-1990.

AR 1-2	F[2, 6]	=	.80	AR 1-4	F[4, 4]	=	2.31
ARCH 1	F[1, 6]	=	.65	ARCH 4	F[4,]	=	.
Normality	χ ² (2)	=	.75	RSS =	.0029, σ	=	.019
R ² =	.98 , <u>R</u> ²	=	.88	SC =	-7.09, HQ	=	-7.55
FPE		=	.00057				

With the following static long-run equation:

$$\begin{array}{rcccc}
 uult_{nl} = & .222 & -.001 uw_{nl} & +.0108 t & +.00005 t^2 \\
 & (.200) & (.015) & (.0176) & (.00045) \\
 & & & & \\
 & -.00056 SLP8487 & & -.00013 SLP8890 & \\
 & (.00041) & & (.00044) &
 \end{array}$$

Wald test $\chi^2 (5) = 116.48$

The index SLP8487 is significant (a t-value of approximately 2). Also, the time trends have clearly lost their significance. These findings indicate that the 'pure' long-term unemployment component in the adjusted long-term unemployment ratio is quite dominant³¹.

On the whole the evidence suggests that the impact of the wage cost subsidies on the adjusted long-term unemployment ratio is of less importance compared with their effect on the 'pure' long-term unemployment ratio.

We have also investigated the impact of the Dutch replacement ratio on $uult_{nl}$. This did not prove to be a fruitful exercise. The coefficient of rr_{nl} not only had the wrong (negative) sign, it was insignificant as well. The same applies to the coefficients of rre_{nl} and rrc_{nl} (tests not reported here). Apparently, the Dutch replacement ratio is not as important when it comes to explaining the pattern of the adjusted long-term unemployment ratio as it was for the pattern of the orthodox Dutch long-term unemployment ratio.

Having investigated variables affecting the pure long-term unemployment component of the adjusted long-term unemployment ratio, it is time to focus on

³¹ In line with the results as regards model specification (UULTNL2), we have tested for the significance of SLP8690, denoting the effect of the wage cost subsidies for the period 1986-1990. The results were unambiguous: SLP8690 was clearly insignificant.

ity stock. However, because of the insignificance of the replacement ratio we do not report the tests here.

Summarizing, we have not been able to find any significant variable having a downward effect on the number of the unmeasured unemployed. This is not surprising, because, despite the 1987 system reform, the number of unmeasured unemployed (as did the number of people enlisted on the WAO and AAW disability schemes) continued to grow and it took the Dutch government until 1991 to implement an additional package of measures to curb the growth of the Disability stock. Whether these measures will have the desired effect remains very much to be seen.

All in all, we can conclude that the Dutch effort aimed at the reduction of the long-term unemployment burden has not been completely without success. However, it has proven to be very difficult to sustain the effect of these wage cost subsidies. Also, the adjusted long-term unemployment ratio has been less sensitive to these policies than the orthodox long-term unemployment ratio.

5.3. Swedish Model Specifications.

5.3.1. The Swedish Beveridge Curve.

In this section we will discuss the Swedish *Beveridge curve*. As we have seen in the descriptive chapters, labour market patterns in Sweden are not like those in Great Britain and the Netherlands.

Lu_{sv} denotes the logarithm of the Swedish unemployment rate, whereas Lv_{sv} represents the logarithm of the Swedish vacancy rate. As instruments we use the logarithm of the Swedish vacancy series lagged once and twice.

Our starting point is the Swedish core model specification :

The 'Core' Beveridge Curve for Sweden. (SV1.).

$$\begin{aligned} Lu_{sv} = & \quad .056 & +.711 L1u_{sv} & \quad -.263 L2u_{sv} & \quad -.265 Lv_{sv} \\ & (.144) & (.185) & (.189) & (.142) \\ & +.0431 t & - .00089 t^2 & & \\ & (.0176) & (.00039) & & \end{aligned}$$

Instruments used: $L1v_{sv}$ and $L2v_{sv}$.

$L1v_{sv}$ and $L2v_{sv}$ denote the first and second lag of the logarithm of the Swedish vacancy series.

Sample period: 1962-1990.

AR 1-2	F[2,21]	=	.88	AR 1-4	F[4,19]	=	1.25
ARCH 1	F[1,21]	=	.047	ARCH 4	F[4,15]	=	.11
χ^2	F[9,13]	=	1.15	Normality	χ^2 (2)	=	42.45
RSS =	.31 , σ	=	.12	Specification	χ^2	=	2.72

$\chi^2 (5)/5$, testing $\beta = 0$: 30.405

With the following static long-run equation:

$$Lu_{sv} = \begin{matrix} -.103 \\ (.255) \end{matrix} \quad \begin{matrix} -.480 \\ (.279) \end{matrix} Lv_{sv} \quad \begin{matrix} +.0781 \\ (.0264) \end{matrix} t \quad \begin{matrix} -.00161 \\ (.00064) \end{matrix} t^2$$

Wald test $\chi^2 (3) = 32.397$

As we can see, the fit is not very good. The explanatory power of the model specification is rather limited. More importantly the result for the normality test is so poor, that making any inference from the results is very questionable indeed. This result is rather unsatisfactory. Also, given the shape of the Swedish *Beveridge curve* - (figure 4.B., section 3.2.) - it is clear that it is difficult to find any particular trend in the relationship between unemployment and vacancies in the Swedish labour market - it is not surprising that we are facing problems with 'normality' in this Swedish model specification (SV1.)³². Hopefully, we can improve the model specification by including variables which denote the labour market features as described in the previous three chapters.

As regards the sensitivity of our results towards the chosen method of estimation, we refer to table A4. in the appendix to this chapter. In that table are also presented the results as regard the 'adjusted core model specification', see below.

³² Looking at the residuals of model specifications (SV1.), (SV3.) and (SV4.), we find that there is an 'outlier' for 1971. Re-estimating these model specifications while including a pulse dummy for 1971, leads to a significant coefficient of the pulse dummy and a fall of the 'normality' χ^2 to about 4. However, there are no very substantive changes in the other parameters. So, there are no particular reasons for using the pulse dummy in the model specifications (SV1.), (SV3.) and (SV4.).

We start our Swedish investigation by looking at the possible impact of long-term unemployment on the Swedish unemployment pattern. As we have discussed before (see section 3.4.), in comparison with Great Britain and the Netherlands, Sweden suffers from a very mild form of the long-term unemployment virus (also, see table 8.). Again, we will use the long-term unemployment ratio as a proxy for declining search effectiveness and search intensity, but this series (lt_{sv}) is different from the long-term unemployment ratios used in the British and Dutch model specifications. The long-term unemployment threshold is only six months as regards the used Swedish data, whereas the threshold as regards lt_{gb} and lt_{nl} is twelve months. This makes direct comparison impossible. As we have stated before, the Swedish long-term unemployment ratio with its twelve month threshold is very low. Given all this, we do not expect to find the Swedish long-term unemployment ratio playing a significant role when it comes to explaining the Swedish unemployment pattern. However, consider model specification (SV2.):

The Swedish *Beveridge Curve* and lt_{sv} (SV2.).

$$\begin{array}{rcccccc}
 Lu_{sv} = & -.257 & +.823 & L1u_{sv} & -.338 & L2u_{sv} & -.291 & Lv_{sv} & +.449 & lt1_{sv} \\
 & (.450) & (.148) & & (.147) & & (.094) & & (1.258) & \\
 & & & & & & & & & \\
 & +.0438 & t & & -.00083 & t^2 & & & & \\
 & (.0401) & & & (.00073) & & & & &
 \end{array}$$

Instruments used: $L1v_{sv}$ and $L2v_{sv}$.

$lt1_{sv}$ denotes the Swedish long-term unemployment ratio lagged once.

Sample period: 1972-1990³³.

³³ Data regarding Swedish long-term unemployment is only available since 1971, which is the reason for the adjusted sample period.

AR 1-2 F[2,10] = 1.31
 ARCH 1 F[1,10] = .53
 Normality χ^2 (2) = .30
 Specification χ^2 = 2.16

AR 1-4 F[4, 8] = 5.65
 ARCH 4 F[4, 4] = .22
 RSS = .040, σ = .057

χ^2 (6)/6, testing $\beta = 0$: 41.662

With the following static long-run equation:

$Lu_{sv} =$	-.498	-.565 Lv_{sv}	+.872 $lt1_{sv}$	+.0851 t	-.00161 t^2
	(.985)	(.204)	(2.167)	(.0991)	(.00181)

Wald test χ^2 (4) = 36.680

As we can see, this model specification does not suffer from 'normality' problems. The standard error of the regression and the residual sum of squares are rather low, but the result on autocorrelation, AR 1-4, is unacceptable at the five percent level. The coefficient on the Swedish long-term unemployment ratio, although having the correct sign, is insignificant. This confirms our feeling that long-term unemployment is not crucial when it comes to explaining the Swedish unemployment pattern.

As regards unemployment benefit duration and the Swedish unemployment pattern, we refer the reader to chapter 4. We have stated that the Swedish unemployed benefits are only available for a limited period of time. However, after that period the Swedish government guarantees employment of some sort (in this context we refer to our discussion of adjusted and corrected Swedish unemployment rates in chapter 4., and the econometric analysis regarding these unemployment rates below). The Swedish labour market system has not changed dramatically over the last three decades. Therefore, we do not have to include a variable denoting the possible effect of changes as regards the duration of the unemployment benefit on

expect some positive impact on the Swedish unemployment pattern³⁴. Clearly, rr_{sv} has the wrong sign and is of no significance whatsoever. This result does not alter when we regress the adjusted and corrected Swedish unemployment rates on rr_{sv} (see the next two paragraphs). We will therefore not report any model specification containing rr_{sv} below.

All in all, the replacement ratio and the long-term unemployment ratio do not influence the Swedish unemployment pattern.

5.3.2. The Adjusted Swedish Beveridge Curve.

As described in chapter 4., there are extensive labour market programs in Sweden. In comparison to Great Britain and the Netherlands, many Swedish unemployed are enlisted on these programs, especially the labour market training and the relief work programs. We can extend our analysis by incorporating those enlisted on these labour market programs in the orthodox unemployment figures (otherwise known as 'open unemployment'). We refer to the 'adjusted unemployment' data on Sweden presented in section 4.2.3.³⁵. Consequently, Luc_{sv}

³⁴ Data regarding the Swedish replacement rate is only available for the period 1967-1988. The sample period is adjusted accordingly. Extending the sample period by using the observation of 1988 for the years 1989 and 1990 does not change our conclusions as regards the impact of rr_{sv} at all. As regards $lt1_{sv}$, we have used noughts for the years 1967-1971.

³⁵ As far as it concerns labour market programs, the adjusted figures only contain data on labour market training and relief works. As regards recruitment subsidies and youth teams, data is only available for 1984 and after. Data on 'in-plant training to avoid lay-

represents the logarithm of the adjusted Swedish unemployment rate. Consider, the adjusted Swedish core model specification:

The Adjusted 'Core' Beveridge Curve for Sweden. (SV4.).

$$\text{Luc}_{\text{sv}} = \begin{matrix} -.023 & +.742 \text{ L1uc}_{\text{sv}} & -.401 \text{ L2uc}_{\text{sv}} & -.269 \text{ Lv}_{\text{sv}} \\ (.103) & (.122) & (.128) & (.077) \\ \\ +.0779 \text{ t} & -.00163 \text{ t}^2 & & \\ (.0176) & (.00036) & & \end{matrix}$$

Instruments used: L1v_{sv} and L2v_{sv} .

Sample period: 1962-1990.

AR 1-2	F[2,21]	= 1.59	AR 1-4	F[4,19]	= 1.93
ARCH 1	F[1,21]	= .18	ARCH 4	F[4,15]	= .13
Normality	χ^2 (2)	= 49.14	RSS = .14	, σ	= .08
Specification	χ^2	= 5.22			

$$\chi^2 (5)/5, \text{ testing } \beta = 0 : 89.164$$

With the following static long-run equation:

$$\text{Luc}_{\text{sv}} = \begin{matrix} -.035 & -.409 \text{ Lv}_{\text{sv}} & +.118 \text{ t} & -.00248 \text{ t}^2 \\ (.153) & (.141) & (.015) & (.00036) \end{matrix}$$

$$\text{Wald test } \chi^2 (3) = 164.36$$

In comparison with the Swedish core model specification the standard error of the regression is lower (see table A4. in the appendix to this chapter). The explanatory power of the regression has also improved, so has the value for the Wald test. The value as regards the test on the validity of the selected instruments is, although increased, still acceptable. However, as with the Swedish core model specification (we refer to our discussion of the 'normality problem' concerning that

offs' is available for the years 1974 and after, but the number of people enlisted on that program is relatively small.

model specification), the test result on normality is not acceptable.

We continue with including the Swedish long-term unemployment ratio in the model specification. Before doing that, we have to make one further assumption; because we do not have appropriate data on long-term unemployment as regards the adjusted Swedish unemployment data, we assume that with regard to the adjusted Swedish unemployment figures the long-term unemployment ratio is the same as for the orthodox Swedish unemployment data. Consider the following model specification:

The Adjusted Swedish Beveridge Curve and lt_{sv} (SV5.).

$$\begin{aligned}
 Luc_{sv} = & \quad .358 & +.723 L1uc_{sv} & \quad -.525 L2uc_{sv} & \quad -.332 Lv_{sv} & \quad +1.128 lt1_{sv} \\
 & (.263) & (.090) & (.101) & (.048) & (.692) \\
 & +.0447 t & -.00095 t^2 & & & \\
 & (.0215) & (.00041) & & &
 \end{aligned}$$

Instruments used: $L1v_{sv}$ and $L2v_{sv}$.

$lt1_{sv}$ denotes the Swedish long-term unemployment ratio lagged once.

Sample period: 1972-1990.

AR 1-2	F[2,10]	= 1.25	AR 1-4	F[4, 8]	= 3.36
ARCH 1	F[1,10]	= 2.84	ARCH 4	F[4, 4]	= 1.14
Normality	χ^2 (2)	= .97	RSS =	.020 , σ	= .041
Specification	χ^2	= 4.24			

χ^2 (6)/6, testing $B = 0$: 63.012

With the following static long-run equation:

$$\begin{aligned}
 Luc_{sv} = & \quad .447 & \quad -.415 Lv_{sv} & \quad +1.408 lt1_{sv} & \quad +.0533 t & \quad -.00119 t^2 \\
 & (.313) & (.083) & (.689) & (.0285) & (.00054)
 \end{aligned}$$

Wald test χ^2 (4) = 108.43

In comparison to model specification (SV2.) the diagnostic test results have improved dramatically, with a decrease in σ and the RSS, and an increase in the result on $\chi^2 (6)/6$, testing $\beta = 0$, and the Wald test. Furthermore, there is no sign of autocorrelation. More interesting is the fact that the coefficient on $lt1_{sv}$ has a t-value of approximately two³⁶. Also, see table A5. in the appendix to chapter. This indicates that the Swedish long-term unemployment ratio is more important when it comes to explaining the adjusted Swedish unemployment pattern than the Swedish unemployment pattern based on orthodox definitions.

5.3.3. The Unmeasured Unemployed and the Swedish *Beveridge Curve*.

As discussed in section 4.3.2., the Swedish practice as regards disability policies has led to a legally accepted inflow of older workers into the disability stock. Without this legal nicety, they would be enlisted as unemployed. Whether this practice has any significant impact on the Swedish unemployment pattern is topic for investigation. To tackle the modelling problems as regards the unmeasured unemployed, we have constructed (see section 4.3.2.) an unmeasured unemployment rate (uu_{sv}). As we have described in section 5.2.2., the inflow into the disability stock is supposed to reduce the turnover rate. Thus, we expect a negative coefficient on uu_{sv} .

This econometric exercise has not been very fruitful. Model specifica-

³⁶ This finding is in line with Calmfors (1991), pp. A5-A6.

tions containing just this unmeasured unemployment rate, apart from vacancies, the long-term unemployment ratio, trends and a constant term, do not lead to impressive results: uu_{sv} appears to be insignificant, and has the wrong (positive) sign. Given the relatively³⁷ small number of Swedish unmeasured unemployed this result is not completely unexpected.

In accordance with our analysis of the Dutch unmeasured unemployed we have constructed an unemployment rate (uw_{sv}) corrected for the unmeasured unemployed. Also, we have constructed an adjusted long-term unemployment ratio ($uult_{sv}$). There is no reason to object to the hypothesis that those enlisted on the Swedish disability scheme for labour market reasons would otherwise have been regarded as long-term unemployed. We regressed the unemployment rate corrected for the unmeasured unemployed on the adjusted long-term unemployment ratio (see model specification (NL8.) and model specification (SV6.) below). The results are very similar to the results presented with model specification (SV2.). The only remarkable difference is that the adjusted Swedish long-term unemployment ratio seems to be less insignificant than the unadjusted one.

Furthermore, we constructed an unemployment rate (ucw_{sv}) both adjusted for labour market programs (see section 5.3.2.) and corrected for the Swedish unmeasured unemployed. Finally, we constructed a long-term unemployment ratio ($uuct_{sv}$) which takes account for the labour market programs - again, we have to assume that regarding the adjusted Swedish unemployment figures the long-term unemployment ratio is the same as for the orthodox Swedish unemploy-

³⁷ This is relative in comparison with the Netherlands, but in comparison with the Dutch disability practice all existing disability practices are mild.

ment data - and the unmeasured unemployed (we refer to section 4.3.2.).

Consequently, consider the following model specification:

The Corrected Swedish *Beveridge Curve* (SV6.).

$$\begin{aligned} \text{Lucw}_{sv} = & .279 & +.777 \text{ L1ucw}_{sv} & -.589 \text{ L2ucw}_{sv} & -.315 \text{ Lv}_{sv} \\ & (.229) & (.078) & (.097) & (.045) \\ & +.0468 t & -.00109 t^2 & +1.480 \text{ uuclt1}_{sv} \\ & (.0191) & (.00037) & (.584) \end{aligned}$$

Instruments used: L1v_{sv} and L2v_{sv} .

Lucw_{sv} denotes the log of the Swedish unemployment rate adjusted for labour market programs and unmeasured unemployment. L1ucw_{sv} and L2ucw_{sv} denote its first and second lag respectively. uuclt1_{sv} represents the Swedish long-term unemployment ratio corrected for the labour market programs and the unmeasured unemployed lagged once.

Sample period: 1972-1990.

AR 1-2	F[2,10]	=	.73	AR 1-4	F[4, 8]	=	3.95
ARCH 1	F[1,10]	=	2.45	ARCH 4	F[4, 4]	=	1.40
Normality	χ^2 (2)	=	1.25	RSS=	.017 , σ	=	.037
Specification	χ^2	=	4.14				

$$\chi^2 (6)/6, \text{ testing } \beta = 0 : 71.387$$

With the following static long-run equation:

$$\begin{aligned} \text{Lucw}_{sv} = & .343 & -.387 \text{ Lv}_{sv} & +1.822 \text{ uuclt1}_{sv} & +.0577 t & -.00134 t^2 \\ & (.276) & (.067) & (.546) & (.0240) & (.00044) \end{aligned}$$

$$\text{Wald test } \chi^2 (4) = 143.55$$

The results are very much like those reported with model specification (SV5.). For the robustness of the results, see table A5. in the appendix to this chapter. This finding, and the absence of any impact of uu_{sv} on the open unemployment *Beveridge curve*, make it quite clear that the impact of the Swedish

unmeasured unemployed on the Swedish unemployment, adjusted or not, is negligible.

5.4. British Model Specifications.

5.4.1. The British Beveridge Curve.

In line with the practice of the previous sections we will start with an estimation of the British core model specification. Lu_{gb} and Lv_{gb} denote the logarithm of the British unemployment rate and vacancy rate respectively. The instruments used are the first and second lag of the logarithm of the British vacancy series. The sensitivity of the results to the method of estimation and the incorporation of 'corrected' vacancy figures, see below, can be found in table A6. in the appendix to this chapter. Consider, the following British model specification:

The 'Core' Beveridge Curve for Great Britain. (GB1.).

$$Lu_{gb} = \begin{matrix} -.217 & +.798 & L1u_{gb} & -.494 & Lv_{gb} & +.032 & t & -.00057 & t^2 \\ (.146) & (.092) & & (.122) & & (.017) & & (.00041) \end{matrix}$$

Instruments used: $L1v_{gb}$ and $L2v_{gb}$.

$L1v_{gb}$ and $L2v_{gb}$ denote the first and second lag of the logarithm of the British vacancy rate.

Sample period: 1962-1990.

AR 1-2	F[2,22]	= 2.63	AR 1-4	F[4,20]	= 1.74
ARCH 1	F[1,22]	= 1.31	ARCH 4	F[4,16]	= .50
χ^2	F[7,16]	= .52	Normality	χ^2 (2)	= .13
RSS = .43	, σ	= .13	Specification	χ^2	= 6.73

χ^2 (4)/4, testing $B = 0$: 188.81

With the following static long-run equation:

$$Lu_{gb} = -1.077 \quad -2.450 Lv_{gb} \quad +.159 t \quad -.00283 t^2$$

$$(.835) \quad (1.191) \quad (.094) \quad (.00254)$$

$$\text{Wald test } \chi^2 (3) = 28.655$$

As with the Dutch and Swedish core model specifications, the result is not very impressive. Noteworthy, is the result regarding the specification χ^2 , it indicates that the choice of instruments is questionable. The first thing we can do to improve the core model specification is to use the corrected British vacancy series (series: vc_{gb}). We have discussed the characteristics of the vacancy correction factor in paragraph 3.1.2.. However, we need to dwell on one further point. As is obvious when we look at the data on the vacancy correction factor (v.c.f.), this correction factor cannot be constructed for the whole sample period. To overcome this deficiency we have used either the first available observation (thus for the years up to 1968 we use the v.c.f. for 1968) or the last available observation (thus for the years after 1984 we have used the v.c.f. for 1984), for the construction of the corrected British vacancy series. Thus, for the periods 1960-1968 and 1984-1990 the v.c.f. series is constant. Again, there are no superior data available for these periods (we refer to our discussion in section 3.1.2.).

Let us continue with the core model specification based on the corrected vacancy data. The instruments are the first and second lag of the logarithm of the corrected British vacancy series. (We have also incorporated the corrected vacancy figures with a non-constant v.c.f. for the years after 1984. The results, which are more or less the same as the ones presented below can be found in table A6. in the

appendix to this chapter. Consider the model specification below:

The Corrected 'Core' Beveridge Curve for Great Britain. (GB2.).

$$Lu_{gb} = \begin{matrix} .532 \\ (.277) \end{matrix} + \begin{matrix} +.761 \\ (.099) \end{matrix} L1u_{gb} - \begin{matrix} .425 \\ (.135) \end{matrix} Lvc_{gb} + \begin{matrix} +.0254 \\ (.0187) \end{matrix} t - \begin{matrix} .00056 \\ (.00043) \end{matrix} t^2$$

Instruments used: $L1vc_{gb}$ and $L2vc_{gb}$.

$L1vc_{gb}$ and $L2vc_{gb}$ denote the first and second lag of the logarithm of the corrected British vacancy rate.

Sample period: 1962-1990.

AR 1-2	F[2,22]	= 2.80	AR 1-4	F[4,20]	= 1.89
ARCH 1	F[1,22]	= 2.43	ARCH 4	F[4,15]	= .53
χ^2	F[7,16]	= .23	Normality	χ^2 (2)	= .082
RSS = .47	, σ	= .14	Specification	χ^2	= 3.88

$$\chi^2 (4)/4, \text{ testing } \beta = 0 : 170.97$$

With the following static long-run equation:

$$Lu_{gb} = \begin{matrix} 2.222 \\ (1.338) \end{matrix} - \begin{matrix} 1.775 \\ (.789) \end{matrix} Lvc_{gb} + \begin{matrix} +.106 \\ (.081) \end{matrix} t + \begin{matrix} .00234 \\ (.00219) \end{matrix} t^2$$

$$\text{Wald test } \chi^2 (3) = 34.712$$

The results are rather similar to the previous model specification, with an important improvement. The test result on the choice of instruments (the Specification χ^2) is now acceptable. However, the two British model specifications above tell us that there is an awful lot left to explain.

We will now turn to the test of the significance of those variables which we have discussed, *i.e.* structural mismatch and long-term unemployment. To start with the former, in section 3.3., we described two British mismatch index series, one on occupational mismatch, the other on regional mismatch. As we have seen (see

table 7. and figure 5.), the regional mismatch series has declined over the sample period, whereas the occupational mismatch series fluctuated around a value of 0.4. As with the Dutch model specifications, see paragraph 5.1.1., we first tested the significance of the British mismatch series by including $Lmmo_{gb}$ (the logarithm of the British occupational mismatch index³⁸) and $Lmmr_{gb}$ (the logarithm of the British regional mismatch index) in the model specification (a test not reported here). This was not a fruitful exercise: both variables are insignificant. However, the occupational mismatch series was less insignificant than the regional mismatch series. As with our Dutch model specifications the regressions indicated that the impact of British occupational mismatch on unemployment 'had a difference look'. Hence, we included both the difference and its first lag of the two mismatch series in the model specification. This indicated that the occupational mismatch series was least insignificant. The final results are:

Mismatch and the British Beveridge Curve (GB3.).

$$\begin{array}{rcccc}
 Lu_{gb} = & .975 + & .487 L1u_{gb} & -.324 L2u_{gb} & -.507 Lvc_{gb} \\
 & (.281) & (.140) & (.163) & (.133) \\
 & +.0014 t & -.00130 t^2 & +.508 DL1mmo_{gb} & \\
 & (.0281) & (.00104) & (.374) &
 \end{array}$$

Instruments used: $L1vc_{gb}$ and $L2vc_{gb}$.

$DL1mmo_{gb}$ denotes the first lag of the difference of the logarithm of the British occupational mismatch series ($DLmmo_{gb} = Lmmo_{gb} - L1mmo_{gb}$).

³⁸ Data on the occupational mismatch series is only available for the period 1962-1982 (also, see table 7.). For the period 1983-1990 we have used the last observation available, *i.e.* 1982. Given the relative stability of the series, this seemed an acceptable thing to do.

Sample period: 1964-1982³⁹.

AR 1-2 F[2,10] = .069
ARCH 1 F[1,10] = 1.71
Normality χ^2 (2) = .42
Specification χ^2 = .64

AR 1-4 F[4, 8] = .35
ARCH 4 F[4, 4] = .34
RSS = .096 , σ = .12

χ^2 (7)/7, testing $\beta = 0$: 116.04

With the following static long-run equation:

$$Lu_{gb} = 1.164 \quad +.607 DL1mmo_{gb} \quad -.606 Lvc_{gb} \quad +.0017 t \quad -.00156 t^2$$

(.373) (.481) (.221) (.0034) (.00109)

Wald test χ^2 (4) = 272.83

The diagnostic test results do not give reason for comment. Note, that in comparison with previous model specifications, the second lag of the dependent variable is now significant. As we can see the t-value of the coefficient on the occupational mismatch series is approximately 1.35, not overwhelmingly significant, but not completely insignificant either. This indicates that, although there is no reason to believe that mismatch has caused a significant shift in the British *Beveridge curve*, there might be some, possibly short-run, impact of occupational mismatch on the pattern of British unemployment. A point to which we will return in due course.

We will now proceed with embodying the long-term unemployment variable into the British model specification. As with the Dutch and Swedish model specifications we will do this by using the long-term unemployment ratio; series lt_{gb} (see table 8., section 3.4.). We have used the long-term unemployment ratio

³⁹ The sample size is adjusted to the years for which observations on $DL1mmo_{gb}$ are available.

lagged twice or thrice or a sum of those series in the British model specifications (tests not reported here). However, as regards the British model specifications the best results were obtained while using the British long-term unemployment ratio lagged once ($lt1_{gb}$). See the model specification below:

The Impact of the British Long-term Unemployment Ratio (GB4.).

$$\begin{array}{l}
 Lu_{gb} = \quad .017 \quad +1.086 L1u_{gb} \quad -.696 L2u_{gb} \quad -.549 Lvc_{gb} \\
 \quad \quad (.256) \quad (.147) \quad (.203) \quad (.145) \\
 \quad \quad +.0585 t \quad -.00176 t^2 \quad +4.146 lt1_{gb} \quad +.799 DL1mmo_{gb} \\
 \quad \quad (.0161) \quad (.00049) \quad (1.039) \quad (.340)
 \end{array}$$

Instruments used: $L1vc_{gb}$ and $L2vc_{gb}$.

Sample period: 1962-1990⁴⁰.

AR 1-2	F[2,19] = .023	AR 1-4	F[4,17] = .29
ARCH 1	F[1,19] = 1.66	ARCH 4	F[4,13] = .32
χ^2	F[13, 7] = .33	Normality χ^2 (2)	= 2.60
RSS = .20	, σ = .097	Specification χ^2	= .33

χ^2 (7)/7, testing $B = 0$: 207

With the following static long-run equation:

$$\begin{array}{l}
 Lu_{gb} = \quad .027 \quad -.899 Lvc_{gb} \quad +6.793 lt1_{gb} \quad +1.309 DL1mmo_{gb} \\
 \quad \quad (.421) \quad (.278) \quad (1.194) \quad (.665) \\
 \quad \quad +.0958 t \quad -.00289 t^2 \\
 \quad \quad (.0224) \quad (.00080)
 \end{array}$$

Wald test χ^2 (5) = 487.05

The diagnostic test results are all acceptable. What we see is a clear significance of both the long-term unemployment ratio and the variable denoting British occupational mismatch ($DL1mmo_{gb}$ has a t-value of approximately 2.35).

⁴⁰ The observations for the years 1962-1964 and 1983-1990 on $DL1mmo_{gb}$ are noughts.

Note, estimating the same model specification, a test not reported here, for the period 1962-1982 leads, surprisingly, to a slightly smaller t-value of the coefficient on $DL1mmo_{gb}$.

However, as regards the British occupational mismatch series, we have to dwell on one further point. We have used the observation of 1982 for the period 1983-1990. Hence, the differenced series has noughts for the last eight observations. The lack of reliable observations for the period 1983-1990 and the decreased significance of $DL1mmo_{gb}$ when estimating for the period 1962-1982 questions the importance of occupational mismatch when it comes to explaining shifts of the British *Beveridge curve* for the whole sample period⁴¹.

Therefore, we will now present a model specification, estimated for the whole sample period, without a variable representing occupational mismatch but including the British long-term unemployment ratio lagged once. Hence:

lt_{gb} and the British *Beveridge Curve* (GB5.).

$$\begin{aligned}
 Lu_{gb} = & \quad -.016 \quad +1.016 L1u_{gb} \quad -.644 L2u_{gb} \quad -.529 Lvc_{gb} \quad +3.981 lt1_{gb} \\
 & \quad (.287) \quad (.153) \quad (.221) \quad (.164) \quad (1.163) \\
 & \quad +.0619 t \quad -.00175 t^2 \\
 & \quad (.0179) \quad (.00055)
 \end{aligned}$$

Instruments used: $L1vc_{gb}$ and $L2vc_{gb}$.

Sample period: 1962-1990.

AR 1-2	F[2,20]	=	.012	AR 1-4	F[4,18]	=	.30
ARCH 1	F[1,20]	=	.95	ARCH 4	F[4,14]	=	.18
χ^2	F[11,10]	=	.38	Normality	χ^2 (2)	=	.89

⁴¹ By analogy to our investigation on the Dutch mismatch effect, we have 'rechecked' the long-run occupational mismatch effect by estimating a model specification including $Lmmo_{gb}$. In this model specification the long-run elasticity of $Lmmo_{gb}$ is entirely insignificant.

$$RSS = .26, \sigma = .11$$

$$\text{Specification } \chi^2 = .030$$

$$\chi^2 (6)/6, \text{ testing } B = 0 : 193.23$$

With the following static long-run equation:

$$Lu_{gb} = \begin{matrix} -.025 \\ (.455) \end{matrix} \quad \begin{matrix} -.844 \\ (.301) \end{matrix} Lvc_{gb} \quad \begin{matrix} +6.383 \\ (1.300) \end{matrix} lt1_{gb} \quad \begin{matrix} +.0986 \\ (.0244) \end{matrix} t \quad \begin{matrix} -.00279 \\ (.00086) \end{matrix} t^2$$

$$\text{Wald test } \chi^2 (4) = 389.82$$

This result gives enough reason for comment. First of all, in comparison with the previous British model specifications both time trends are significant. The coefficient of the first lag of the British long-term unemployment ratio is indisputably significant, denoting the decline in search effectiveness and search intensity among quite a few in the British unemployment pool. The results of the tests on normality, the choice of instruments and autocorrelation are satisfactory. The last two British model specifications lead to improved results as regards the residual sum of squares, the standard error of the regression and the explanatory power of the regression. All this reflects the importance of long-term unemployment in explaining the British unemployment pattern.

We continue by determining the possible impact of the British replacement ratio (rr_{gb}) on the unemployment pattern. As we have seen in chapter 4., rr_{gb} has been remarkably stable over the years. Only since 1985 has a downward trend in the value of rr_{gb} been apparent. In order to shed some light on the effect of the British replacement ratio, we present model specification (GB6.):

The Impact of the British Replacement Ratio (GB6.).

$$\begin{aligned}
 Lu_{gb} = & \quad -.852 & \quad +.932 L1u_{gb} & \quad -.580 L2u_{gb} & \quad -.564 Lvc_{gb} & \quad +5.280 rr_{gb} \\
 & (.508) & (.125) & (.175) & (.124) & (2.378) \\
 & +.0266 t & -.00071 t^2 & +3.801 lt1_{gb} & +.749 DL1mmo_{gb} \\
 & (.0204) & (.00070) & (.955) & (.313)
 \end{aligned}$$

Instruments used: $L1vc_{gb}$ and $L2vc_{gb}$.

rr_{gb} denotes the British replacement ratio.

Sample period: 1962-1990⁴².

AR 1-2	F[2,18]	=	.0087	AR 1-4	F[4,16]	=	.70
ARCH 1	F[1,18]	=	.84	ARCH 4	F[4,12]	=	.28
χ^2	F[15, 4]	=	.29	Normality	χ^2 (2)	=	.36
RSS = .15	, σ	=	.085	Specification	χ^2	=	.42

$$\chi^2 (8)/8, \text{ testing } \beta = 0 : 238.15$$

With the following static long-run equation:

$$\begin{aligned}
 Lu_{gb} = & \quad -1.315 & \quad -.871 Lvc_{gb} & \quad +5.866 lt1_{gb} & \quad +1.156 DL1mmo_{gb} \\
 & (.752) & (.233) & (1.137) & (.533) \\
 & +.0410 t & -.00110 t^2 & +8.149 rr_{gb} \\
 & (.0302) & (.00108) & (3.777)
 \end{aligned}$$

$$\text{Wald test } \chi^2 (5) = 754.44$$

The diagnostic test results are rather good. In comparison to model specification (GB4.), the explanatory power has improved. The significance of $lt1_{gb}$ and $DL1mmo_{gb}$ is restated. For the robustness of these results, we refer to table A7. in the appendix to this chapter. Additionally, the British replacement ratio

⁴² As regards rr_{gb} , a consistent data series is available for the years 1966 and after. For the years 1962-1965, we have used the observation for 1966. We consider this entirely acceptable given the stability of the series. However, we have run regressions with an adjusted sample period, *i.e.* 1966-1990. This hardly changed the value of the coefficients.

is irrefutably significant. As regards the significance of π_{gb} , we have obtained a comparable result, a test not reported here, when we omit $DL1mmo_{gb}$ from the model specification.

All in all, the results above, indicate that there can be no doubt that for the whole sample period, the relative level of the unemployment benefit, a decline in search intensity and search effectiveness, and to a lesser extent occupational mismatch, have affected the British *Beveridge curve*.

The time has come to test for the possible impact of the developments regarding the British Invalidity Benefit. We will do this in the same manner as we have tested for the impact of the developments regarding the disability scheme on the Dutch *Beveridge curve*. A few introductory remarks are appropriate. We have data available for the period 1972-1990⁴³. Consequently, we had to adjust the sample period. Tests have shown that for this period the significance of both π_{gb} and $DL1mmo_{gb}$ diminishes. Therefore, incorporating these variables does not serve any purpose (the incorporation of these variables also further reduces the significance level of the unmeasured unemployment rates, see below). Also, by omitting these variables the regressions become directly comparable to the Dutch model specification (NL7.), which only contains the long-term unemployment ratio and the unmeasured unemployment rates as well.

We have discussed the characteristics of the British unmeasured unemployment series at great length in the previous chapter. Its construction required some tentative assumptions. However, it enables us to test for the possible impact of these series, thereby giving us an impression of the relative importance of the

⁴³ IVB was first introduced in 1971. See Molho (1989), p. 238.

table 25. The Impact of British Unmeasured Unemployment (*).

Variable	IVE, Lvc_{gb} , & $uu2c_{gb}$	OLS, $Lvcd_{gb}$, & $uu2c_{gb}$	OLS, Lvc_{gb} , & uux_{gb}	IVE, $Lvcd_{gb}$, & uux_{gb}
constant	-1.383 (1.161)	-1.240 (.826)	.163 (.972)	.661 (1.006)
$L1u_{gb}$	.710 (.204)	.580 (.168)	.971 (.207)	.825 (.161)
$L2u_{gb}$	-.385 (.259)	-.264 (.193)	-.628 (.249)	-.455 (.262)
Lv_{gb}	-.607 (.157)	-.612 (.124)	-.614 (.152)	-.693 (.128)
$lt1_{gb}$	3.207 (1.191)	2.423 (.665)	4.716 (.803)	3.972 (1.209)
uu_{gb} (**)	2.849 (2.282)	3.343 (1.337)	-1.224 (.921)	-1.109 (1.038)
t	.216 (.107)	.214 (.072)	.030 (.095)	.0019 (.0967)
t^2	-.0057 (.0025)	-.0056 (.0016)	-.00068 (.00213)	-.00004 (.00222)
AR 1-1 F[1,10]	.00050	.019	1.58	1.51
ARCH 1 F[1,9]	.11	.10	.28	.059
Normality χ^2 χ_i^2	.45	.44	.37	.47
RSS	.080	.052	.087	.063
σ	.085	.069	.089	.075
Specification χ^2 R^2	2.69	.991	.985	.45

Ad.(*) Sample period: 1972-1990. The dependent variable is Lu_{gb} . At the beginning of the second column is described what the difference is w.r.t. the first. Thus, 'OLS, $Lvcd_{gb}$ ' denotes that the first model specification is reestimated by OLS while incorporating $Lvcd_{gb}$ rather than Lvc_{gb} . The third and fourth model specifications are estimated while incorporating uux_{gb} rather than $uu2c_{gb}$.

Ad.(**) For the first two columns one should read $uu2c_{gb}$, for the last two one should read uux_{gb} .

British disability problem as regards the British *Beveridge curve*.

In table 25. we present some of the results, for further details, we refer to tables A8.I. and A8.II. in the appendix to this chapter. As we can see, the results are not very promising. The unmeasured unemployment rate $uu2c_{gb}$, which was constructed on the basis of a correction factor which was correlated with the British unemployment pattern apart from periods in which unemployment was falling, is sometimes significant but in all cases it has the wrong sign. We expect any unmeasured unemployment rate to have a downward on unemployment (inward shifting impact on the *Beveridge curve*). This is clearly not the case⁴⁴.

The performance of uux_{gb} is rather better. This series was constructed on basis of available employment status data as regards the IVB recipients. At least its coefficient has the correct sign. However, uux_{gb} is never significant. Its t-value is around one. The results depicted in tables A8.I. and A8.II. in the appendix to this chapter, indicate that the findings as presented above are robust.

Given the above, it seems appropriate to conclude that despite the appearance of the British disability problem during the eighties, it has not had a clear inward shifting impact on the British *Beveridge curve*.

⁴⁴ We have also tested for a British unmeasured unemployment rate which always follows the pattern of British unemployment (compare to $uudw_{nl}$). However, apart from the fact that IVB receipt also increases when unemployment falls, this series always had the wrong, positive, sign (not that surprising if it is correlated with unemployment), whereas its Dutch counterpart performed rather better.

In section 5.1.3. we discussed the Dutch long-term unemployment pattern. Turning to the British long-term unemployment model specification, we are looking for exogenous variables (x_{ltu_t}), which could influence the British long-term unemployment pattern. However, in line with our investigation of Dutch long-term unemployment, we shall start with reporting a model specification including the lagged dependent variable and (lags of) the unemployment rate, which was estimated using Ordinary Least squares (OLS):

British Long-term Unemployment (LTGB1.).

$$\begin{aligned}
 lt_{gb} = & \quad .099 \quad +.115 \quad lt1_{gb} \quad -.014 \quad u_{gb} \quad +.036 \quad u1_{gb} \\
 & \quad (.030) \quad (.133) \quad (.003) \quad (.004) \\
 & \quad -.0007 \quad t \quad -.00007 \quad t^2 \\
 & \quad (.0019) \quad (.00004)
 \end{aligned}$$

u_{gb} denotes the British unemployment rate. $u1_{gb}$ denotes its first lag.

Sample period: 1961-1990.

AR 1-2	F[2,22]	= 1.83	AR 1-4	F[4,20]	= 1.26
ARCH 1	F[1,22]	= .73	ARCH 4	F[4,16]	= .38
χ^2	F[9,14]	= 1.32	Normality	χ^2 (2)	= .76
RSS = .0047,	σ	= .014	$R^2 = .98$,	\underline{R}^2	= .87
SC = -8.07,	HQ	= -8.27	FPE		= .00024

With the following static long-run equation:

$$\begin{aligned}
 lt_{gb} = & \quad .112 \quad +.025 \quad u_{gb} \quad -.0003 \quad t \quad +.00003 \quad t^2 \\
 & \quad (.018) \quad (.002) \quad (.0021) \quad (.00007)
 \end{aligned}$$

$$\text{Wald test } \chi^2 (3) = 946.07$$

As we can see, the diagnostic test results are quite satisfactory. There are no problems regarding autocorrelation or heteroscedasticity. The value of R^2 (adjusted for degrees of freedom) is acceptable, and the value of \underline{R}^2 (R^2 relative to differences and seasonals) is not too low. The values concerning the information criteria: Schwarz Criterion, Hannan-Quinn Criterion and the final prediction error (FPE), are sufficiently low. The lagged dependent variable ($lt1_{gb}$) is not as significant as the time trends.

In line with equation (27.b.)⁴⁵ we should continue with testing the impact of British labour market policies aimed especially at the reduction of long-term unemployment. The most significant policies which come to mind in that context are the 'Community Program' and the 'Restart program' (we refer to our discussion in section 3.4.).

To investigate the impact of these programs we will include pulse dummies for the years 1983 and after, simply to see if there were any systematic shifts in the relationship. The 'Community Program' had its most significant number of beneficiaries from 1983 until 1988, when the program was abandoned. The 'Restart Program' started during 1986. But annual data are only available for the years 1987 and after. We can already make one additional remark.

Consider the following model specification:

⁴⁵ As with the Dutch model specifications, we do not include a variable representing the impact of unemployment benefit duration (bd_t) into the model specification. The duration of benefits has scarcely changed in Great Britain over the last three decades. See Layard, Nickell and Jackman (1991), p. 258.

lt_{gb} and 'Equal Coefficients' (LTGB2.).

$$\begin{aligned}
 lt_{gb} = & \quad .053 \quad +.357 \, lt1_{gb} \quad -.019 \, u_{gb} \quad +.049 \, u1_{gb} \quad -.055 \, r83 \\
 & \quad (.047) \quad (.163) \quad (.006) \quad (.006) \quad (.015) \\
 & \quad -.072 \, r84 \quad -.069 \, r85 \quad -.080 \, r86 \quad -.100 \, r87 \quad -.091 \, r88 \\
 & \quad (.018) \quad (.019) \quad (.020) \quad (.023) \quad (.030) \\
 & \quad -.049 \, r89 \quad -.017 \, r90 \quad -.00040 \, t \quad +.000044 \, t^2 \\
 & \quad (.039) \quad (.046) \quad (.00418) \quad (.000169)
 \end{aligned}$$

r83, r84, r85, r86, r87, r88, r89 and r90 denote pulse dummies with the value 0 during the whole sample period except for the year they represent. In that particular year the dummy takes value 1. So, r83 takes value 1 for the year 1983 and 0 for all other years, etc.

Sample period: 1961-1990.

AR 1-2	F[2,14]	=	.19	AR 1-4	F[4,12]	=	2.36
ARCH 1	F[1,14]	=	.52	ARCH 4	F[4, 8]	=	.51
Normality	$\chi^2 (2)$	=	.080	RSS =	.0026, σ	=	.0013
R ² =	.991, \underline{R}^2	=	.93	SC =	-7.78, HQ	=	-8.22
FPE		=	.00024				

With the following static long-run equation:

$$\begin{aligned}
 lt_{gb} = & \quad .082 \quad +.046 \, u_{gb} \quad -.085 \, r83 \quad -.111 \, r84 \quad -.107 \, r85 \\
 & \quad (.058) \quad (.018) \quad (.059) \quad (.069) \quad (.070) \\
 & \quad -.125 \, r86 \quad -.155 \, r87 \quad -.142 \, r88 \quad -.076 \, r89 \quad -.026 \, r90 \\
 & \quad (.072) \quad (.072) \quad (.064) \quad (.062) \quad (.077) \\
 & \quad -.00062 \, t +.000068 \, t^2 \\
 & \quad (.00620) \quad (.000285)
 \end{aligned}$$

$$\text{Wald test } \chi^2 (11) = 614.07$$

As we can see, most of the coefficients on the pulse dummies are both negative and highly significant. Only the value of the coefficient on r90 is out of line. Thus, it seems sensible to continue with a model specification incorporating

variables representing the 'Community Program' and the 'Restart' program⁴⁶.

CPLT denotes the ratio of the number of beneficiaries of the 'Community Program' to the number of long-term unemployed. As we have seen in section 3.4., the number of beneficiaries of the 'Community Program' has increased markedly since 1983. RESTART denotes the number of interviews with long-term unemployed persons to the number of long-term unemployed. Consequently:

Labour Market Measures and British Long-term Unemployment (LTGB3.).

$$\begin{array}{rcccc}
 lt_{gb} = & .098 & +.198 lt1_{gb} & -.020 u_{gb} & +.044 u1_{gb} \\
 & (.032) & (.117) & (.004) & (.005) \\
 & -.0022 t & +.00010 t^2 & -.249 CPLT & -.013 RESTART \\
 & (.0027) & (.00010) & (.069) & (.006)
 \end{array}$$

RESTART denotes the ratio of 'restart interviews' to the number of long-term unemployed persons (0 up to 1987). CPLT denotes the ratio of the number of beneficiaries to the 'Community Program' to the number of long-term unemployed persons (0 up to 1983, and after 1988)⁴⁷.

Sample period: 1961-1990.

AR 1-2	F[2,20]	=	.16	AR 1-4	F[4,18]	=	.85
ARCH 1	F[1,20]	=	1.52	ARCH 4	F[4,14]	=	.85
χ^2	F[13, 8]	=	.78	Normality	$\chi^2 (2)$	=	.40
RSS =	.0030, σ	=	.012	$R^2 =$	.99, \underline{R}^2	=	.91
SC =	-8.28, HQ	=	-8.54	FPE		=	.00018

⁴⁶ We have estimated comparable model specifications including pulse dummies for the period 1983-1988 (regarding the 'Community Program') and 1987-1990 (regarding the 'Restart Program'). As regards the 'Community Program', the value of the coefficients varies from -.039 to -.066. If we include a pulse dummy for 1982 (the 'Community Program' was introduced in 1982) its coefficient is of a much smaller size. As regards the 'Restart Program', the value of the coefficients varies from -.035 to -.049. Thus, the coefficient of r90 is of the same size as the coefficients of r87, r88 and r89. Also, if we include a pulse dummy for 1986 (the 'Restart Program' started during 1986) its coefficient is significantly smaller than the other four coefficients.

⁴⁷ The 'Community Program' was ended in 1988. Monthly data on the number of beneficiaries is available until September 1988. We have extrapolated the available data for 1988, in order to obtain a yearly average for 1988.

With the following static long-run equation:

$$\begin{aligned}
 lt_{gb} = & \quad .123 \quad +.029 u_{gb} \quad -.311 \text{ CPLT} \quad -.016 \text{ RESTART} \\
 & \quad (.028) \quad (.007) \quad (.142) \quad (.010) \\
 & \quad -.0027 t \quad +.00012 t^2 \\
 & \quad (.0033) \quad (.00014)
 \end{aligned}$$

$$\text{Wald test } \chi^2 (5) = 1104.7$$

The diagnostic test results of the last two model specifications are rather good. The values of the information criteria are very low given the relatively small number of observations. Both the variable representing the 'Community Program' and the ratio denoting the 'Restart Program' are quite significant, and its coefficients have the expected negative sign.

We have also tested for the significance of the British replacement ratio as regards lt_{gb} (tests not reported here). Somewhat surprisingly, π_{gb} appeared to be insignificant. Moreover, its coefficient had the wrong, negative, sign. Thus, in contrast with our findings regarding Lu_{gb} , π_{gb} is not important when it comes to explaining the pattern of the British long-term unemployment ratio. Also, we have tested for the impact of mismatch on the British long-term unemployment pattern. The consequence of including the regional and occupational mismatch indices (see section 3.3., table 7.) in a regression explaining the British long-term unemployment ratio is shown below:

Mismatch and British Long-term Unemployment (LTGB4.).

$$\begin{aligned}
 lt_{gb} = & \quad -.049 \quad +.108 lt1_{gb} \quad -.019 u_{gb} \quad +.045 u1_{gb} \quad -.00050 t \\
 & \quad (.065) \quad (.084) \quad (.003) \quad (.004) \quad (.00275) \\
 & \quad +.00009 t^2 +.121 mmr_{gb} \quad +.260 mmo_{gb} \quad -.010 \text{ RESTART} \quad -.244 \text{ CPLT} \\
 & \quad (.00010) \quad (.061) \quad (.138) \quad (.006) \quad (.069)
 \end{aligned}$$

mmo_{gb} denotes the British occupational mismatch index, whereas mnr_{gb} denotes the British regional mismatch index⁴⁸.

Sample period: 1961-1990.

AR 1-2	F[2,18]	= 4.00	AR 1-4	F[4,16]	= 1.97
ARCH 1	F[1,18]	= .94	ARCH 4	F[4,12]	= .80
χ^2	F[17, 2]	= .56	Normality	χ^2 (2)	= .33
RSS =	.0021, σ	= .010	R^2 =	.99, \underline{R}^2	= .94
SC =	-8.45, HQ	= -8.77	FPE		= .00014

With the following static long-run equation:

$$\begin{aligned}
 l_{t_{gb}} = & \quad -.055 \quad +.029 u_{gb} \quad -.274 \text{ CPLT} \quad -.011 \text{ RESTART} \\
 & \quad (.065) \quad (.005) \quad (.108) \quad (.009) \\
 & \quad -.00057 t +.00010 t^2 \quad +.135 mnr_{gb} \quad +.292 mmo_{gb} \\
 & \quad (.00278) \quad (.00011) \quad (.068) \quad (.126)
 \end{aligned}$$

Wald test χ^2 (7) = 1832.9

Apart from a slight autocorrelation problem, the AR 1-2 test result is not acceptable at the five percent level, the diagnostic test results have improved in comparison with previous model specifications. Obviously, both mismatch indices appear to be significant and their coefficients have the correct sign. An increase in mismatch should lead to an increase in long-term unemployment. When we adjust the sample period in accordance to with the available data, *i.e.* 1962-1982, and omitting CPLT and RESTART from the model specification, the significance of both mismatch variables increases. Evidently, in contrast to the British unemployment pattern, occupational and regional mismatch are significant when it comes to explaining the British long-term unemployment pattern.

⁴⁸ Data on the occupational mismatch index is only available from 1962 until 1982. For the period 1983-1990, we have used the observation for 1982. For both mno_{gb} and mnr_{gb} , we have used the observation of 1962 for 1961.

As we have seen British long-term unemployment has been in decline since 1987. Apparently, the 'Restart Program' has had, for various reasons, a decreasing impact on the British long-term unemployment figures. The 'Restart Program' may have denied people their entitlement to unemployment benefit. It may have forced the long-term unemployed to take up less productive (low-paid) jobs. Alternatively, the 'Restart Program' may have helped the long-term unemployed to search more effectively for jobs. In any case, changes in search intensity and search effectiveness of the unemployed have proven to be of crucial significance for the British *Beveridge curve*.

5.5. Summary.

In this chapter we have presented various model specifications regarding the *Beveridge curve* for Great Britain, the Netherlands and Sweden. First we have investigated the characteristics of the data. As it appeared the unemployment and vacancy series of all three countries seem to have a local unit root, despite our feeling that in the long-run unemployment and vacancies exhibit no particular trends. However, we have proven that the unexplained variation of unemployment is stationary. This justified using model specifications which are equivalent to error correction models.

As regards the Dutch *Beveridge curve* we have proven the significance of the long-term unemployment ratio as a proxy for altered search intensity and effectiveness, and to a lesser extent occupational mismatch. Moreover, the unmeasured unemployment rate, our indicator of the hidden unemployment component in the Dutch disability stock, had an undeniably significant impact on the Dutch unemployment pattern. With respect to the Swedish *Beveridge curve* it has been hard to find any clear pattern. Long-term unemployment appears to be significant as regards the Swedish open unemployment rate, whereas the Swedish unmeasured unemployment rate proved to have no discernable effect whatsoever.

Regarding the British *Beveridge curve*, both the long-term unemployment ratio and to a lesser extent the replacement rate proved to be of clear significance. Apparently, the change of search effectiveness and search intensity caused an

outward shift of the British *Beveridge curve*. The described toughened attitude of the British authorities towards the unemployed during the eighties has not missed its effect on the unemployment figures. As with the Dutch *Beveridge curve* there seems to be no long-run effect of structural mismatch. But the British occupational mismatch index was not completely insignificant regarding the British unemployment pattern. We have not been able to find clear significance for all constructed British unmeasured unemployment rates. This in sharp contrast to our tests regarding various Dutch unmeasured unemployment rates. These findings appear to be reasonably robust.

Structural mismatch turns out to be more important when it comes to explaining the British long-term unemployment pattern. Also, the variables which denote the effect of British programs (the 'Community Program' and the 'Restart Program') aimed at the long-term unemployment problem are clearly significant. Mismatch is insignificant with regard to the Dutch long-term unemployment pattern. However, the impact of the various programs aimed at the reduction of long-term unemployment in the Netherlands, denoted by SLP, is not to be neglected. Also, the replacement ratio is important when it comes to explaining the Dutch long-term unemployment pattern. The adjusted Dutch long-term unemployment pattern proved to be far more difficult to explain. We will return to this point in the following chapter, where we will elaborate further on the empirical evidence presented in this chapter.

table A1. Model Specification (NL1.) (*).

Variable	IVE, Lv_{nl} (NL1.)	OLS, Lv_{nl}	IVE, Lvc_{nl}	OLS, Lvc_{nl}
constant	.022 (.201)	-.093 (.156)	.221 (.258)	-.131 (.183)
$L1u_{nl}$	.523 (.292)	.716 (.236)	.582 (.273)	.673 (.204)
$L2u_{nl}$	-.219 (.258)	-.351 (.289)	-.251 (.241)	-.315 (.242)
$L3u_{nl}$	.111 (.140)	.150 (.173)	.093 (.133)	.116 (.154)
Lv_{nl}	-.445 (.162)	-.317 (.073)	-.463 (.174)	-.394 (.105)
t	.068 (.018)	.066 (.018)	.033 (.019)	.037 (.015)
t^2	-.0011 (.0004)	-.0010 (.0004)	-.00022 (.00059)	-.00046 (.00042)
AR 1-2 F[2,22]	2.57	2.46	2.05	2.62
ARCH 1 F[1,22]	.0037	.36	.10	.0005
Normality χ^2	.076	1.37	.58	1.85
χ^2 F[11,12]	1.52	1.90	1.39	1.57
RSS	.51	.46	.43	.42
σ	.15	.14	.13	.13
Specification χ^2	.064		2.46	
R^2		.98		.99

Ad.(*). Sample period: 1960-1990. The dependent variable is Lu_{nl} . At the beginning of the second column is described what the difference is w.r.t. model specification (NL1.). Thus, 'OLS, Lv_{nl} ' denotes that model specification (NL1.) is reestimated by OLS. The third and fourth columns show regressions which have been run while incorporating Lvc_{nl} (the Dutch vacancy series using CBS-data for the last decade) rather than Lv_{nl} .

table A2. Model Specification (NL5.) (*).

Variable	IVE, Lv_{nl} (NL5.)	OLS, Lv_{nl}	IVE, Lvc_{nl}	OLS, Lvc_{nl}
constant	-2.629 (.810)	-2.368 (.506)	-2.118 (1.068)	-1.880 (.581)
$L1u_{nl}$	.591 (.198)	.694 (.116)	.339 (.353)	.659 (.143)
$L2u_{nl}$	-.705 (.214)	-.775 (.185)	-.539 (.333)	-.754 (.219)
Lv_{nl}	-.497 (.154)	-.366 (.099)	-.497 (.323)	-.377 (.118)
$lt1_{nl}$	3.868 (1.491)	3.081 (.921)	4.727 (2.328)	2.814 (.998)
π_{nl}	1.199 (.750)	1.350 (.592)	.019 (1.268)	.889 (.670)
$DLmm_{nl}$	.252 (.190)	.250 (.136)	-.018 (.289)	.112 (.151)
$DL1mm_{nl}$	.254 (.218)	.163 (.164)	.115 (.281)	.012 (.151)
t	.242 (.114)	.184 (.059)	.298 (.174)	.160 (.070)
t^2	-.0052 (.0033)	-.0033 (.0017)	-.0064 (.0050)	-.0021 (.0019)
AR 1-2 F[2,12]	1.79	.73	1.19	.69
ARCH 1 F[1,12]	.026	.015	.18	.069
Normality χ^2 Ξ^2	.62	.86	.81	1.15
RSS	.21	.18	.41	.24
σ	.14	.11	.17	.13
Specification χ^2	.36		.07	
R^2		.99		.99

Ad.(*) Sample period: 1964-1987. The dependent variable is Lu_{nl} . At the beginning of the second column is described what the difference is w.r.t. model specification (NL5.). Thus, 'OLS, Lv_{nl} ' denotes that model specification (NL1.) is reestimated by OLS. The third and fourth columns show regressions which have been run while incorporating Lvc_{nl} rather than Lv_{nl} .

table A3.I. Model Specification (NL7.) (*).

Variable	IVE, $L_{v_{nl}}$ & uu_{nl} (NL7.)	OLS, $L_{v_{nl}}$ & uu_{nl}	IVE, $L_{vc_{nl}}$ & uu_{nl}	OLS, $L_{vc_{nl}}$ & uu_{nl}
constant	-5.644 (.976)	-5.633 (.938)	-6.417 (1.063)	-6.233 (.846)
$L1u_{nl}$	.296 (.141)	.347 (.170)	.201 (.169)	.306 (.137)
$L2u_{nl}$	-.333 (.112)	-.334 (.166)	-.341 (.119)	-.341 (.135)
$L_{v_{nl}}$	-.292 (.074)	-.254 (.045)	-.491 (.132)	-.385 (.067)
$lt1_{nl}$	1.445 (.756)	1.192 (.627)	2.846 (1.086)	2.124 (.731)
uu_{nl}	-.430 (.126)	-.435 (.124)	-.633 (.141)	-.597 (.114)
t	.623 (.101)	.616 (.099)	.718 (.114)	.687 (.092)
t^2	-.0108 (.0018)	-.0105 (.0017)	-.0123 (.0021)	-.0116 (.0017)
AR 1-2 F[2,12]	1.32	3.18	2.66	2.37
ARCH 1 F[1,12]	.10	.35	.0019	.0070
Normality χ^2	.21	.055	.96	.57
χ^2				
RSS	.059	.056	.067	.057
σ	.065	.063	.069	.064
Specification χ^2	.064		.099	
R^2		.995		.995

Ad.(*) Sample period: 1969-1990. The dependent variable is Lu_{nl} . At the beginning of the second column is described what the difference is w.r.t. model specification (NL7.). Thus, 'OLS, $L_{v_{nl}}$ ' denotes that model specification (NL7.) is reestimated by OLS. The third and fourth columns show regressions which have been run while incorporating $L_{vc_{nl}}$ rather than $L_{v_{nl}}$.

table A3.II Model Specification (NL7.) continued (*).

Variable	IVE, Lv_{nl} & $uudw_{nl}$	OLS, Lv_{nl} & $uudw_{nl}$	IVE, Lvc_{nl} & $uudw_{nl}$	OLS, Lvc_{nl} & $uudw_{nl}$
constant	-6.806 (1.165)	-6.036 (.912)	-7.609 (2.457)	-5.145 (1.352)
$L1u_{nl}$	.194 (.146)	.295 (.142)	.019 (.332)	.379 (.143)
$L2u_{nl}$	-.314 (.106)	-.334 (.130)	-.356 (.195)	-.392 (.139)
Lv_{nl}	-.474 (.086)	-.401 (.058)	-.951 (.335)	-.546 (.100)
$lt1_{nl}$	2.541 (.758)	2.086 (.568)	5.836 (2.417)	3.178 (.926)
$uudw_{nl}$	-.612 (.157)	-.507 (.126)	-.913 (.390)	-.494 (.180)
t	.763 (.129)	.674 (.101)	.886 (.283)	.588 (.145)
t^2	-.0137 (.0024)	-.0120 (.0019)	-.0160 (.0053)	-.0104 (.0026)
AR 1-2 F[2,12]	2.53	2.88	1.58	.55
ARCH 1 F[1,12]	.047	.039	2.79	1.38
Normality χ^2	.90	.24	1.06	1.42
χ^2				
RSS	.052	.045	.18	.097
σ	.061	.057	.11	.083
Specification χ^2	.00018		1.06	
R^2		.996		.992

Ad.(*). Sample period: 1969-1990. The dependent variable is Lu_{nl} . At the beginning of each column is described what the difference is w.r.t. model specification (NL7.). For instance, 'OLS, Lvc_{nl} & $uudw_{nl}$ ' denotes that model specification (NL7.) is reestimated by OLS incorporating Lvc_{nl} rather than Lv_{nl} and uu_{nl} is replaced by $uudw_{nl}$.

table A3.III. Model Specification (NL7.) continued (*).

Variable	IVE, Lv_{nl} , uu_{nl} & uul_{nl}	IVE, Lvc_{nl} , uu_{nl} & uul_{nl}	IVE, Lv_{nl} , $uudw_{nl}$ & $uudw1_{nl}$	IVE, Lvc_{nl} , $uudw_{nl}$ & $uudw1_{nl}$
constant	-9.314 (2.593)	-7.850 (2.583)	-8.380 (2.617)	-4.911 (2.405)
$L1u_{nl}$	.063 (.228)	.153 (.225)	.083 (.239)	.296 (.246)
$L2u_{nl}$	-.312 (.120)	-.324 (.123)	-.308 (.122)	-.340 (.150)
Lv_{nl}	-.276 (.059)	-.440 (.098)	-.518 (.126)	-.761 (.236)
$lt1_{nl}$	1.395 (.722)	2.514 (.907)	2.831 (.997)	4.519 (1.709)
uu_{nl} (**)	-.809 (.281)	-.787 (.289)	-.782 (.316)	-.622 (.357)
t	.988 (.264)	.856 (.264)	.926 (.279)	.598 (.265)
t^2	-.0166 (.0044)	-.0145 (.0044)	-.0165 (.0050)	-.0109 (.0048)
AR 1-1 F[1,12]	1.04	.33	.55	.016
ARCH 1 F[1,11]	.13	.0087	.26	3.93
Normality χ^2 Ξ^2	.40	.65	.63	1.03
RSS	.060	.064	.061	.095
σ	.068	.070	.069	.086
Specification χ^2 R^2	.034	.46	.19	.78

Ad.(*) Sample period: 1970-1990. The dependent variable is Lu_{nl} . At the beginning of each column is described what the difference is w.r.t. model specification (NL7.). For instance, 'IVE, Lvc_{nl} , $uudw_{nl}$ & $uudw1_{nl}$ ' denotes that model specification (NL7.) is reestimated by IVE incorporating Lvc_{nl} rather than Lv_{nl} and uu_{nl} is replaced by $uudw_{nl}$ (this variable is an endogenous variable as well) and $uudw1_{nl}$ is used as an additional instrument.

Ad.(**) for the third and fourth regression one should read $uudw_{nl}$ rather than uu_{nl} .

table A3.IV. Model Specification (NL7.) continued (*).

Variable	IVE, Lv _{nl} , & u _{nl}	OLS, Lv _{nl} , & u _{nl}	IVE, Lvc _{nl} , & u _{nl}	OLS, Lvc _{nl} , & u _{nl}	IVE, Lv _{nl} , u _{nl} & u _{nl} ¹	IVE, Lvc _{nl} , u _{nl} & u _{nl} ¹
constant	-7.075 (1.287)	-6.651 (1.223)	-7.792 (2.108)	-6.457 (1.493)	-9.444 (3.208)	-6.506 (3.292)
L1u _{nl}	.263 (.144)	.344 (.147)	.134 (.256)	.386 (.137)	.175 (.219)	.321 (.228)
L2u _{nl}	-.379 (.110)	-.384 (.145)	-.430 (.169)	-.425 (.148)	-.384 (.123)	-.397 (.143)
Lv _{nl}	-.361 (.073)	-.308 (.047)	-.684 (.215)	-.428 (.078)	-.362 (.078)	-.573 (.145)
lt1 _{nl}	2.205 (.767)	1.829 (.624)	4.583 (1.780)	2.746 (.876)	2.360 (.918)	3.717 (1.336)
u _{nl}	-.827 (.223)	-.759 (.217)	-1.123 (.394)	-.841 (.258)	-1.199 (.512)	-.987 (.563)
t	.767 (.134)	.717 (.128)	.864 (.226)	.701 (.154)	1.002 (.326)	.728 (.337)
t ²	-.0119 (.0021)	-.0111 (.0019)	-.0132 (.0034)	-.0105 (.0023)	-.0151 (.0047)	-.0109 (.0048)
AR 1-2 F[2,12]	2.95	2.89	2.15	.30	1.68	.13
ARCH 1 F[1,12]	.0073	.47	1.91	.20	.59	2.23
Normality χ^2	.74	.17	1.01	1.05	.35	.93
Xi ²						
RSS	.059	.053	.14	.088	.067	.092
σ	.065	.062	.10	.079	.072	.084
Specification χ^2	.028		.34		.27	.59
R ²		.995		.993		

Ad.(*). Sample period: 1969-1990, but for the last two regressions, due to the incorporation of the additional instrument the sample period is 1970-1990. The dependent variable is Lu_{nl}. At the beginning of each column is described what the difference is w.r.t. model specification (NL7.). For instance, 'IVE, Lvc_{nl}, u_{nl} & u_{nl}¹' denotes that model specification (NL7.) is reestimated by IVE incorporating Lvc_{nl} rather than Lv_{nl} and u_{nl} is replaced by u_{nl} (this variable is an endogenous variable as well) and u_{nl}¹ is used as an additional instrument.

table A4. Model Specifications (SV1.) (*) and (SV4.) (**).

Variable	IVE, Lv_{sv} (SV1.)	OLS, Lv_{sv}	IVE, Lv_{sv} (SV4.)	OLS, Lv_{sv}
constant	.056 (.144)	.017 (.121)	-.023 (.103)	.0057 (.071)
L1 u_{sv} (***)	.711 (.185)	.551 (.252)	.742 (.122)	.707 (.162)
L2 u_{sv} (***)	-.263 (.189)	-.102 (.223)	-.401 (.128)	-.356 (.145)
Lv_{sv}	-.265 (.142)	-.452 (.112)	-.269 (.077)	-.323 (.057)
t	.043 (.018)	.039 (.016)	.078 (.018)	.075 (.013)
t ²	-.00089 (.00039)	-.00086 (.00040)	-.00163 (.00032)	-.00159 (.00032)
AR 1-2 F[2,21]	.88	2.57	1.59	2.21
ARCH 1 F[1,21]	.047	.14	.18	.18
Normality χ^2	42.45	17.70	49.14	36.02
χ^2 F[9,13]	1.15	1.40	.74	.77
RSS	.31	.26	.14	.14
σ	.12	.11	.077	.077
Specification χ^2	2.72		5.22	2.46
R ²		.90		.95

Ad.(*) Sample period: 1962-1990. The dependent variable is Lu_{sv} . At the beginning of the second column is described what the difference is w.r.t. the first. Thus, 'OLS, Lv_{sv} ' denotes that model specification (SV1.) is reestimated by OLS.

Ad.(**) Sample period: 1962-1990. The dependent variable is Luc_{sv} . At the beginning of fourth column is described what the difference is w.r.t. the second. Thus, 'OLS, Lv_{sv} ' denotes that model specification (SV4.) is reestimated by OLS.

Ad.(***) For the third and fourth regression one should read $L1uc_{sv}$ and $L2uc_{sv}$ rather than $L1u_{sv}$ and $L2u_{sv}$.

table A5. Model Specifications (SV5.) (*) and (SV6.) (**).

Variable	IVE, Lv_{sv} (SV5.)	OLS, Lv_{sv}	IVE, Lv_{sv} (SV6.)	OLS, Lv_{sv}
constant	.358 (.263)	.296 (.225)	.279 (.229)	.245 (.196)
L1uc _{sv} (***)	.723 (.090)	.747 (.081)	.777 (.078)	.790 (.069)
L2uc _{sv} (***)	-.525 (.101)	-.542 (.103)	-.589 (.097)	-.597 (.105)
Lv_{sv}	-.332 (.048)	-.308 (.036)	-.315 (.045)	-.302 (.033)
lt1 _{sv}	1.128 (.692)	1.096 (.607)	1.480 (.584)	1.448 (.492)
t	.045 (.022)	.047 (.019)	.047 (.019)	.049 (.017)
t ²	-.00095 (.00041)	-.00104 (.00036)	-.00109 (.00037)	-.00113 (.00035)
AR 1-2 F[2,10]	1.25	1.41	.73	.79
ARCH 1 F[1,10]	2.84	4.03	2.45	2.34
Normality χ^2 Xi ²	.97	1.14	1.25	1.26
RSS	.020	.020	.017	.17
σ	.041	.04	.037	.037
Specification χ^2	4.24		4.14	
R ²		.97		.97

Ad.(*) Sample period: 1972-1990. The dependent variable is Luc_{sv} . At the beginning of the second column is described what the difference is w.r.t. the first. Thus, 'OLS, Lv_{sv} ' denotes that model specification (SV5.) is reestimated by OLS.

Ad.(**) Sample period: 1972-1990. The dependent variable is $Lucw_{sv}$. At the beginning of fourth column is described what the difference is w.r.t. the second. Thus, 'OLS, Lv_{sv} ' denotes that model specification (SV6.) is reestimated by OLS.

Ad.(***) For the third and fourth regression one should read $L1ucw_{sv}$ and $L2ucw_{sv}$ rather than $L1uc_{sv}$ and $L2uc_{sv}$.

table A6. Model Specifications (GB1.) (*) and (GB2.) (**).

Variable	IVE, Lv _{gb} (GB1.)	OLS, Lv _{gb}	IVE, Lvc _{gb} (GB2.)	OLS, Lvc _{gb}	IVE, Lvcd _{gb}	OLS, Lvcd _{gb}
constant	-.217 (.263)	-.222 (.158)	.532 (.277)	.832 (.203)	.676 (.260)	.945 (.173)
L1u _{gb}	.798 (.092)	.788 (.108)	.761 (.099)	.724 (.116)	.700 (.093)	.653 (.105)
Lv _{gb}	-.494 (.122)	-.589 (.086)	-.425 (.135)	-.600 (.085)	-.500 (.127)	-.651 (.075)
t	.032 (.017)	.030 (.018)	.025 (.019)	.018 (.017)	.021 (.017)	.015 (.015)
t ²	-.00057 (.00041)	-.00051 (.00044)	-.00056 (.00043)	-.00042 (.00043)	-.00038 (.00039)	-.00022 (.00036)
AR 1-2 F[2,22]	2.63	3.05	2.80	3.43	2.32	2.94
ARCH 1 F[1,22]	1.31	.56	2.43	.98	2.27	1.21
Normality χ^2	.13	.21	.082	.30	.053	.30
Xi ² F[7.16]	.52	.68	.47	.47	.25	.50
RSS	.43	.41	.41	.41	.37	.32
σ	.13	.13	.14	.13	.12	.12
Specification χ^2	6.73		3.88		3.93	
R ²		.97		.97		.98

Ad.(*) Sample period: 1962-1990. The dependent variable is Lu_{gb}. At the beginning of the second column is described what the difference is w.r.t. the first. Thus, 'OLS, Lv_{gb}' denotes that model specification (GB1.) is reestimated by OLS.

Ad.(**) Sample period: 1962-1990. The dependent variable is Lu_{sv}. At the beginning of fourth column is described what the difference is w.r.t. the third. Thus, 'OLS, Lvc_{gb}' denotes that model specification (GB2.) is reestimated by OLS. Also, model specifications (GB1.) and (GB2.) are estimated, by IVE and OLS, while incorporating Lvcd_{gb} in the regression. The results are shown in columns five and six.

table A7. Model Specification (GB6.) (*).

Variable	IVE, Lvc_{gb} (GB6.)	OLS, Lvc_{gb}	IVE, $Lvcd_{gb}$	OLS, $Lvcd_{gb}$
constant	- .852 (.508)	- .710 (.422)	- .646 (.486)	- .494 (.413)
$L1u_{gb}$	.932 (.125)	.913 (.110)	.844 (.122)	.818 (.106)
$L2u_{gb}$	- .580 (.175)	- .562 (.161)	- .505 (.165)	- .482 (.158)
Lv_{gb}	- .564 (.124)	- .618 (.091)	- .583 (.112)	- .635 (.086)
$lt1_{gb}$	3.801 (.955)	3.979 (.751)	3.257 (.838)	3.375 (.690)
π_{gb}	5.280 (2.378)	4.762 (2.000)	4.990 (2.200)	4.479 (1.931)
$DL1mmo_{gb}$	.749 (.313)	.716 (.233)	.657 (.294)	.618 (.241)
t	.027 (.020)	.030 (.017)	.021 (.018)	.024 (.016)
t^2	- .00071 (.00070)	- .00087 (.00051)	- .00042 (.00061)	- .00055 (.00048)
AR 1-2 F[2,18]	.0087	.044	.0041	.037
ARCH 1 F[1,18]	.84	.99	1.10	1.18
Normality χ^2	.36	.76	.38	.86
χ^2 F[15,4]	.29	.31	.27	.26
RSS	.15	.14	.12	.12
σ	.085	.084	.079	.078
Specification χ^2	.42		.067	
R^2		.990		.992

Ad.(*) Sample period: 1962-1990. The dependent variable is Lu_{gb} . At the beginning of the second column is described what the difference is w.r.t. the first. Thus, 'OLS, Lv_{gb} ' denotes that model specification (GB6.) is reestimated by OLS. The regressions presented in columns three and four have been estimated while using $Lvcd_{gb}$ (the British vacancy series obtained while using a non-constant vacancy correction factor for the whole of the eighties) rather than Lvc_{gb} .

table A8.I. British Unmeasured Unemployment Model Specifications (*).

Variable	IVE, Lvc _{gb} , & uu2c _{gb}	OLS, Lvc _{gb} , & uu2c _{gb}	IVE, Lvcd _{gb} , & uu2c _{gb}	OLS, Lvcd _{gb} , & uu2c _{gb}	IVE, Lvc _{gb} , uu2c _{gb} & uu2c1 _{gb}	IVE, Lvcd _{gb} , uu2c _{gb} & uu2c1 _{gb}
constant	-1.383 (1.161)	-1.682 (1.130)	-.976 (.962)	-1.240 (.826)	-3.758 (2.674)	-2.967 (2.401)
L1u _{gb}	.710 (.204)	.706 (.194)	.574 (.167)	.580 (.168)	.824 (.247)	.684 (.187)
L2u _{gb}	-.385 (.259)	-.404 (.221)	-.239 (.218)	-.264 (.193)	-.755 (.271)	-.553 (.275)
Lv _{gb}	-.607 (.157)	-.555 (.148)	-.656 (.127)	-.612 (.124)	-.393 (.251)	-.473 (.225)
lt1 _{gb}	3.207 (1.191)	3.042 (.740)	2.506 (.913)	2.423 (.665)	3.964 (1.103)	3.216 (.864)
uu2c _{gb}	2.849 (2.282)	3.243 (1.505)	3.046 (1.802)	3.343 (1.337)	2.157 (3.810)	2.703 (2.934)
t	.216 (.107)	.241 (.097)	.193 (.086)	.214 (.072)	.381 (.236)	.333 (.204)
t ²	-.0057 (.0025)	-.0062 (.0021)	-.0051 (.0021)	-.0056 (.0016)	-.0082 (.0052)	-.0074 (.0045)
AR 1-1 F[1,10]	.00050	.013	.00002	.019	.013	.0051
ARCH 1 F[1,9]	.11	.22	.029	.10	.18	.10
Normality χ^2 Xi ²	.45	.29	.57	.44	.57	.57
RSS	.080	.079	.053	.052	.047	.035
σ	.085	.085	.070	.069	.069	.059
Specification χ^2	2.69		1.10		.18	.44
R ²		.987		.991		

Ad.(*) Sample period: 1972-1990, except for the last two model specifications. This, because of the incorporation of the lagged unmeasured unemployment rate. The sample period becomes 1973-1990. The dependent variable is Lu_{gb}. At the beginning of the second column is described what the difference is w.r.t. the first. Thus, 'OLS, Lvc_{gb}' denotes that the first model specification is reestimated by OLS. The third and fourth model specifications are estimated while using Lvcd_{gb}, the vacancy rate constructed on basis of a non-constant correction factor for the years after 1984. The fifth and sixth regressions are based on incorporating uu2c_{gb} as an endogenous variable while using its lag as an additional instrument.

table A8.II. British Unmeasured Unemployment Model Specifications contd. (*).

Variable	IVE, Lvc _{gb} , & uux _{gb}	OLS, Lvc _{gb} , & uux _{gb}	IVE, Lvcd _{gb} , & uux _{gb}	OLS, Lvcd _{gb} , & uux _{gb}	IVE, Lvc _{gb} , uux _{gb} & uux1 _{gb}	IVE, Lvcd _{gb} , uux _{gb} & uux1 _{gb}
constant	.269 (1.157)	.163 (.972)	.661 (1.006)	.589 (.669)	-2.308 (1.840)	-1.010 (1.903)
L1u _{gb}	.948 (.177)	.971 (.207)	.825 (.161)	.842 (.206)	.988 (.180)	.891 (.190)
L2u _{gb}	-.591 (.296)	-.628 (.249)	-.455 (.262)	-.480 (.230)	-.844 (.372)	-.679 (.391)
Lv _{gb}	-.654 (.146)	-.614 (.152)	-.693 (.128)	-.669 (.134)	-.458 (.195)	-.546 (.207)
lt1 _{gb}	4.723 (1.417)	4.716 (.803)	3.972 (1.209)	3.993 (.754)	4.840 (1.590)	4.379 (1.559)
uux _{gb}	-1.144 (1.223)	-1.224 (.921)	-1.109 (1.038)	-1.155 (.803)	-.645 (1.594)	-1.012 (1.450)
t	.026 (.113)	.030 (.095)	.0019 (.0967)	.0048 (.0699)	.023 (.161)	.126 (.158)
t ²	-.00070 (.00261)	-.00068 (.00213)	-.00004 (.00222)	-.00005 (.00163)	-.00441 (.00348)	-.00224 (.00328)
AR 1-1 F[1,10]	1.22	1.58	1.51	1.54	1.04	1.77
ARCH 1 F[1,9]	.11	.28	.059	.16	.13	.23
Normality χ^2 Xi ²	.37	.37	.47	.57	.20	.038
RSS	.088	.087	.063	.063	.066	.054
σ	.089	.089	.075	.076	.081	.074
Specification χ^2	1.63		.45		.18	.25
R ²		.985		.989		

Ad.(*) Sample period: 1972-1990, except for the last two model specifications. This, because of the incorporation of the lagged unmeasured unemployment rate. The sample period becomes 1973-1990. The dependent variable is Lu_{gb}. At the beginning of the second column is described what the difference is w.r.t. the first. Thus, 'OLS, Lvc_{gb}' denotes that the first model specification is reestimated by OLS. The third and fourth model specifications are estimated while using Lvcd_{gb}, the vacancy rate constructed on basis of a non-constant correction factor for the years after 1984. The fifth and sixth regressions are based on incorporating uux_{gb} as an endogenous variable while using its lag as an additional instrument.

6. The Beveridge Curve: a Countrywise Comparison.

6.0. Introduction

In chapter 2. we have outlined a theoretical framework in which we have shown how various variables could affect the position of the *Beveridge curve*. In sections 3.3., 3.4. and 4.1., we have described the patterns of structural mismatch, long-term unemployment and the replacement ratio in Great Britain, the Netherlands and Sweden. In sections 4.2., 4.3. and 4.4., we have discussed the patterns of the variables denoting disability regulations in the three countries concerned.

In this chapter we will compare the results as presented in chapter 5., and where necessary refer to the sections mentioned above. In section 6.1., we will concentrate on the explanatory power of model specifications incorporating variables representing mismatch, changing search effectiveness and the relative financial position of the unemployed. Afterwards, in section 6.2., we discuss the explanatory power of the disability arrangements in the three countries as they affect the unemployment pattern. In section 6.3., we will turn to the factors determining the pattern of the long-term unemployment ratio in Great Britain and the Netherlands.

Finally, in section 6.4. we present a summary of our findings regarding the *Beveridge curve*.

In chapter 5, we have presented several model specifications for the *Beveridge curve*. Here, we focus on the model specifications presented in sections 5.2.1., 5.3.1., 5.3.2. and 5.4.1., containing variables such as the long-term unemployment ratio, occupational and regional mismatch indices and the replacement ratio. Below, we will compare the explanatory power of the variables in the most revealing model specifications, *i.e.* model specifications (NL5.), (SV5.) and (GB6.).

We will present and discuss (see tables 26. and 27.) our findings regarding the explanatory power of the variables included in the model specifications. We estimate per period that part of the change in unemployment ($Du_{t,t-1}$) that is explained by the long-term unemployment ratio, mismatch, unmeasured unemployment, replacement ratio and trends, in a particular period while holding vacancies constant. Model specifications incorporating variables denoting the disability system will be discussed in the following section.

In the previous chapter, we presented model specifications which were regressions of the logarithm of the unemployment rate on the different variables (vu_1, vu_2, \dots, vu_n). Adding up the long-run impact of the various variables ($\sum_n [vu_n]$) in a particular period $t,t-1$ would give us the estimated long-run change of the logarithm of the unemployment rate ($DLu_{t,t-1}$). However, we are interested in finding the change in the unemployment rate ($Du_{t,t-1}$). In order to accomplish that, we have to multiply the impact a variable has on the logarithm of

the unemployment rate with the average of the unemployment rate in a particular period ($\bar{u}_{t,t-1}$), where the period of time $t,t-1$ should be reasonably short. So, we have:

$$DLu_{t,t-1} = Du_{t,t-1} / \bar{u}_{t,t-1} \quad (37.)$$

$$DLu_{t,t-1} = (\sum_n [vu_n])_{t,t-1} \quad (38.)$$

$$Du_{t,t-1} = (\sum_n [vu_n * \bar{u}_{t,t-1}])_{t,t-1} \quad (39.)$$

Thus, we estimate the change in unemployment in a particular period ($Du_{t,t-1}$) by adding up the long-run impact of the different variables (denoted by 'total change', see table 26.). In table 26., we present the result of our computations. We present these calculations for the best fitting model specifications. These figures are based on the static long-run equation of the model specification at hand. The numbers presented in the columns denote the contribution of a variable, *e.g.* the long-term unemployment ratio, to the estimated change of the unemployment rate. The figures are presented as 'unemployment percentages'¹.

Before we proceed with discussing the findings presented in table 26., we have to make a couple of additional remarks. We will estimate the change in the unemployment rate while holding vacancies constant, *i.e.* the shift in the *Beveridge curve*. However, as we have seen before (see section 4.2.), the vacancy rate is not

¹ For instance, to establish for the period 1964-1971 the value of *ltu* for the Netherlands, we have used the observations on the Dutch long-term unemployment ratio lagged once for 1971 and 1964. We multiplied the difference with its coefficient in the static long-run, *i.e.* 3.47, see model specification (NL5.). This number has been multiplied with the average value of the Dutch unemployment rate in that period (*i.e.* 1.49) to obtain the impact of *ltu* for that particular period.

necessarily constant over the sample period (especially, the Dutch number of vacancies has fluctuated substantially during the sample period). Therefore, the 'total changes' as presented in table 26., need not correspond precisely to the 'actual changes in unemployment'.

The four periods, *i.e.* 1963-1971, 1971-1980, 1980-1986 and 1986-1990, have been chosen because of their particular characteristics as regards the developments of unemployment, and to a lesser extent vacancies. The beginning of the second and third period coincide with the first and second oil shock. The fourth period starts after a sharp fall in oil prices which took place in 1986.

1963-1971 is a period of relative stability in both the unemployment and vacancy figures in all countries. The period 1971-1980 is characterized by the first major surge of unemployment in both Great Britain (unemployment doubles) and the Netherlands (unemployment more than doubles). At the beginning of the third period unemployment in Great Britain and the Netherlands continued to increase sharply to reach historical heights in 1986. Also in that period, the Dutch vacancy rate reached an all time low. The period 1986-1990 shows a decline in unemployment in both countries. The Swedish unemployment figures do not follow this pattern. Although, Swedish unemployment was high, by Swedish standards, in 1983, it was relatively low in comparison with the British and Dutch figures. Also, the Swedish unemployment figures for the mid-seventies are at the same level as those for 1966 or 1969.

The dependent variable of the presented Swedish model specification (SV5.) is the Swedish open unemployment rate (Luc_{sv}). As we can see, the explanatory power is not particularly striking. This, applies to an even greater

table 26. Explaining Unemployment Patterns at Constant Vacancies
(Percentage Point Changes in Unemployment) (*).

Period	Variable (1)	Country\Model Specification					
		The Netherlands		Sweden		Great Britain	
		(NL5.)		(SV5.)		(GB6.)	
		(2)		(3)		(4)	
1963-1971	ltu	-.55	(.176)			.31	(.060)
	occ.mmatch.	.011	(.006)			.16	(.074)
	rep.rate	.21	(.125)			-.12	(.056)
	trends	1.13	(.218)			.21	(.130)
	aggr. unem.						
	total change	.80				.56	
	act. change	.75				.44	
1971-1980	ltu	2.46	(.786)	.36	(.176)	1.99	(.386)
	occ.mmatch	.077	(.041)			.11	(.051)
	rep.rate	.29	(.173)			-.03	(.014)
	trends	1.09	(.210)	.17	(.046)	-.08	(.049)
	aggr. unem.						
	total change	4.01		.53		1.99	
	act. change	4.31		-.35		2.52	
1980-1986	ltu	10.43	(3.345)	.61	(.299)	11.30	(2.190)
	occ.mmatch	-.13	(.069)			-.65	(.230)
	rep.rate	-2.49	(1.488)			-.74	(.343)
	trends	-2.43	(.468)	-.27	(.074)	-.98	(.605)
	aggr. unem.						
	total change	5.37		.34		8.93	
	act. change	5.88		.36		6.00	
1986-1990	ltu			-.16	(.078)	-.96	(.186)
	occ.mmatch					.00	(.000)
	rep.rate					-1.55	(.718)
	trends			-.23	(.063)	-.67	(.414)
	aggr. unem.						
	total change			-.39		-3.18	
	act. change			-.83		-5.50	

Notes on table 26.

- Ad.(*) The numbers in parentheses denote standard deviations. We cannot provide these figures as regards the sum (total change in aggregate unemployment) because the full covariance matrix of the long run coefficients is not available in PC Give 7.
- Ad.(1) The values presented in the columns denote that part of the change in unemployment explained by the variable at hand in a particular period as expressed in unemployment percentages. Thus, the change in unemployment explained by a variable has been multiplied with \bar{u} (the average value of the unemployment rate in that particular period). For the period 1963-1971 $\bar{u}_{nl} = 1.49$ and $\bar{u}_{gb} = 1.92$. For 1971-1980 $\bar{u}_{nl} = 4.71$, $\bar{u}_{c_{sv}} = 3.67$ and $\bar{u}_{gb} = 3.51$. For 1980-1986 $\bar{u}_{nl} = 12.02$, $\bar{u}_{c_{sv}} = 4.50$ and $\bar{u}_{gb} = 10.08$. For 1986-1990 $\bar{u}_{c_{sv}} = 3.19$ and $\bar{u}_{gb} = 7.33$. So, 'ltu' denotes that part of the shift explained by long-term unemployment ratio, 'occ.mismatch' reflects the mismatch component, 'rep.rate' the replacement ratio and 'trends' the trends. 'total change' denotes the estimated change of unemployment in a particular period and 'act. change in aggr. unem.' denotes the real change of the unemployment rate in that period. Thus, 'act. change in unemployment' = $u_t - u_{t-1}$. For instance, for the period 1980-1986, 'act. change in unemployment' denotes: $u_{86} - u_{80} = \Delta u_{86} + \Delta u_{85} + \dots + \Delta u_{81}$.
- Ad.(2) The dependent variable of model specification (NL5.) is Lu_{nl} .
- Ad.(3) The dependent variable of model specification (SV5.) is Luc_{sv} , the logarithm of the open unemployment rate.
- Ad.(4) The dependent variable of model specification (GB6.) is Lu_{gb} .
-

extent, to other Swedish model specifications. The only variable, apart from the vacancy rate, which was found to be of any significance was the Swedish long-term unemployment ratio, but only when it came to explaining the open Swedish unemployment rate (not the orthodox unemployment rate). It has been extremely difficult to explain the Swedish unemployment pattern by variables as described above (see section 6.2.). Although, the Swedish long-term unemployment ratio is not insignificant when it comes to explaining the Swedish open unemployment pattern, its impact in comparison to the British and Dutch long-term unemployment ratios is relatively small (see table 26., ltu). It is not easy to discover any shift of

the Swedish *Beveridge curve*, see paragraph 4.3.1., figures 4.B. and 13., and we certainly have not been able to find any significant variables affecting the position of the Swedish *Beveridge curve*.

The story regarding the British and Dutch *Beveridge curve* is rather different. As we can see from table 26., the explanatory importance of the mismatch component ('occ.mismatch') with regard to both these countries is pretty limited. For both countries we have estimated model specifications which incorporate differenced occupational mismatch series. The significance of $DL1mmo_{gb}$ is undeniable. The incorporation of first the Dutch long-term unemployment ratio and later the Dutch unmeasured unemployment rate, reduced the significance of $DLmm_{nl}$ and $DL1mm_{nl}$. However, the mismatch indices turned out to be insignificant in the long-run for both British and Dutch model specifications. Summarizing, we can conclude that changes in structural mismatch did not play a very important role in shifting the *Beveridge curves* of the three countries concerned.

We now discuss the impact of the replacement ratio as an indicator of the relative financial well-being of the unemployed on the unemployment patterns. The Swedish replacement ratio was of no significance at all when it came to explaining the Swedish unemployment pattern. As we have seen in chapter 5., the replacement rate for the Netherlands is not overwhelmingly significant, but not completely insignificant either. As we can see in table 26., for the first two periods the replacement rate (rr_{nl}) has a positive impact on Dutch unemployment (as a result of the incorporation of rr_{nl} in the model specification, we can not present any figures regarding the fourth period, because these data are not available). This is not surprising, because as we have seen, see table 13., the Dutch replacement ratio

increased in value until 1976. Afterwards, the impact of rr_{nl} on u_{nl} is downward, in line with the decline of rr_{nl} . The British replacement ratio has had a negative impact on British unemployment over the whole sample period but, because of its stability over the years, the magnitude of the impact is rather small. This changes in the last period (see as regards model specification (GB6.), the value of 'rep.rate'), when the value of the British replacement ratio declines significantly and the downward impact on unemployment becomes reasonably sizeable. This clearly indicates that the tougher attitude of the authorities towards the claimants of unemployment benefit in Great Britain has not missed its effect on the unemployment rate (also, see our discussion regarding the 'Restart Program').

The main contributory variable when it comes to explaining unemployment patterns has undoubtedly been the long-term unemployment ratio (see table 26., 'ltu' regarding the British and Dutch model specifications). We have already discussed the less than striking impact of the Swedish long-term unemployment ratio. The impact of the Dutch and British long-term unemployment ratios has been distinctive indeed.

That is not to say that there are no differences between the British and Dutch long-term unemployment patterns. Since the beginning of the sample period the Dutch long-term unemployment has been decreasing intermittently, to reach an all time low in 1972 (we refer to table 8.). Thus the negative impact on Dutch unemployment (see table 26., the value of 'ltu') does not come as a surprise. Both the values of the British and the Dutch long-term unemployment ratios reached a local peak at the end of the seventies. But, after a small decline in the beginning of the eighties, the values of lt_{nl} and lt_{gb} increased sharply. This is denoted by a more

than sizeable value of l_{tu} in the third period, for these two countries. Afterwards the British and Dutch patterns diverge: the Dutch long-term unemployment continues to increase, though at a much lower rate, whereas the British long-term unemployment decreases by about 8 percent points (see table 8.).

Model specifications (NL5.) and (GB6.) appear to have reasonable explanatory power. The difference between the real change in the unemployment rate and the estimated change in the unemployment rate is small (see table 26, which compares the value of 'act. change in unemployment' with the value of 'total change' for all four periods). The British model specification overestimates the rise in unemployment in the period 1980-1986, and underestimates the decline in unemployment in the following period, because of offsetting vacancy movements. Obviously, the long-term unemployment ratio has been of vital importance when it comes to explaining shifts of the British and Dutch *Beveridge curve*. For further concluding remarks regarding our analysis of the *Beveridge curve*, we refer to the summary at the end of this chapter.

6.2. Disability Arrangements.

Turning our attention to the disability arrangements, we have to discuss whether, and to what extent, these institutional arrangements have affected the unemployment patterns of Great Britain, the Netherlands and Sweden.

We have discussed the main features of the disability arrangements in these three countries in chapter 4. On basis of that discussion, we can conclude that disability arrangements may have affected the British unemployment pattern, in particular during the eighties. As regards the Swedish disability regulations, we have pointed out that ever since the early seventies the Swedish disability arrangements allow for early retirement through the disability channel. The disability arrangements in the Netherlands up to 1987 allowed for persons to be declared 'disabled' on the basis of labour market reasons (low chances of a job) alone. These features justify the computation of unmeasured unemployment rates, as described in chapter 4. As we have seen, the Dutch unmeasured unemployment rates (see table 15.) are of a far greater magnitude than the Swedish (table 19.) or British table (20.B.). Moreover, the unmeasured unemployment rate proved to be of significance when it came to explaining the Dutch unemployment pattern. The British and Swedish unmeasured unemployment rates were of no significance as regards their respective unemployment patterns. Therefore, findings regarding these rates have not been included in table 27.). Also, the adjusted Dutch long-term

table 27. Explaining Unemployment Patterns with 'Disability' at Constant Vacancies (Percentage Point Changes in Unemployment) (*).

Period	Variable (1)	Country\Model Specification					
		The Netherlands		Sweden			
	(NL7.)	(NL7.)	(NL7.)	(SV6.)			
	(2)	(3)	(3)	(4)			
			uusw _{nl}				
1971-1980	ltu	.99	(.417)	1.40	(.351)	.60	(.180)
	unm.unem.	-4.27	(1.327)	-7.32	(1.828)		
	trends	6.98	(.941)	9.79	(1.042)	.12	(.029)
	aggr. unem.						
	total change	3.69		3.89		.72	
	act. change	4.31		4.31		-.23	
1980-1986	ltu	4.19	(1.763)	5.94	(1.488)	1.07	(.321)
	unm.unem.	-.60	(.187)	-6.59	(1.646)		
	trends	1.77	(.239)	5.99	(.638)	-.38	(.091)
	aggr. unem.						
	total change	5.36		5.34		.69	
	act. change	5.88		5.88		.59	
1986-1990	ltu	1.26	(.530)	1.78	(.446)	-.20	(.060)
	unm.unem.	-.38	(.118)	-2.91	(.727)		
	trends	-2.36	(.318)	-.22	(.023)	-.31	(.074)
	aggr. unem.						
	total change	-1.48		-1.35		-.50	
	act. change	-2.31		-2.31		-.94	

Notes on table 27.

- Ad.(*). The numbers in parentheses denote standard deviations. Also, see the notes on table 26, Ad.(*).
- Ad.(1) For 1971-1980 $\bar{u}_{nl} = 4.71$ and $\bar{u}cw_{sv} = 3.74$. For 1980-1986 $\bar{u}_{nl} = 12.02$ and $\bar{u}cw_{sv} = 4.73$. For 1986-1990 $\bar{u}_{nl} = 10.59$ and $\bar{u}cw_{sv} = 3.48$. 'unm.unem.' denotes that part of the shift explained by the unmeasured unemployment or hidden unemployment rate. Also, see the notes on table 26., Ad.(1).
- Ad.(2) The dependent variable of model specification (NL7.) is Lu_{nl} .

- Ad.(3) This is model specification (NL7.) reestimated while incorporating $uusw_{nl}$ rather than uu_{nl} . The correction factor on which $uusw_{nl}$ has been constructed kept rising during the eighties (rather than being constant; uu_{nl}). This is in line with the data as regards the numbers on the AAW\WAO which kept rising until the end of the sample period and available inflow data as regards the WAO (see paragraph 4.2.2.).
- Ad.(4) The dependent variable of model specification (SV6.) is $Lucw_{sv}$. In this particular model specification ltu denotes the impact of the adjusted and corrected Swedish long-term unemployment ratio, *i.e.* $uuct_{sv}$.

unemployment ratio ($uult_{nl}$) was significant when included in a model specification with the logarithm of the adjusted Dutch unemployment rate (Luw_{nl}) as the dependent variable.

In table 27., we present the relevant model specifications². The Swedish model specification results are very much like those presented in table 26. regarding model specification (SV5.). The long-term unemployment ratio, corrected for the labour market programs and adjusted for the impact of the unmeasured unemployed, appears to have reasonable explanatory power when it comes to explaining the pattern of the log of the Swedish unemployment rate both adjusted for labour market programs and corrected for the unmeasured unemployed ($Lucw_{sv}$).

The most important model specification however, are those regarding the

² We have also made computations regarding model specification (NL8.) which are not reported here. Despite the undeniable significance of the Dutch long-term unemployment ratio adjusted for the impact of the unmeasured unemployed when it comes to explaining the adjusted Dutch unemployment rate, see section 5.2.2., this was not a very fruitful exercise. In the period 1971-1980, the estimated change of the adjusted Dutch unemployment rate is much smaller than the actual one, whereas in the period 1980-1986, the estimated change is downward where the adjusted Dutch unemployment rate actually goes up quite a bit. The reason for this phenomenon is not entirely clear. The adjusted long-term unemployment component always points in the right direction. Nevertheless, it is overshadowed by the trend component which reduces its positive impact on the estimated change of the unemployment rate in the first period and overturns it in the second period. It has to be noted that the trends were not of great significance in model specifications regarding the adjusted Dutch unemployment rate.

Dutch unmeasured unemployment rates. The results are comparable with those presented in table 26. regarding model specification (NL5.). Here, we include the unmeasured unemployment rate (uu_{nl}), always regarded as a conservative estimate of the size of the disability problem, in our explanation of the pattern of the orthodox Dutch unemployment rate. Also, we present model specification (NL7.). reestimated while incorporating $uusw_{nl}$. This unmeasured unemployment rate is constructed on basis of a correction factor which is increasing up to the end of the sample period³. Given the available data (the numbers on the AAW\WAO scheme have been increasing up to 1990, also inflow data as regards the WAO have been increasing up to 1989), this appears to be more appropriate than keeping the correction factor constant⁴.

As we can see, in both models, the estimated and actual change of the Dutch unemployment rate are not very different from each other. The magnitude of the impact of the unmeasured unemployment rate uu_{nl} is greatest in the first period. Given the constancy of the correction factor during the eighties, the impact of this unmeasured unemployment rate (we refer to table 27, the values of 'unm.unem.') is expected to be relatively small.

However, when we incorporate $uusw_{nl}$ into the model specification, the

³ For more details on the unmeasured unemployment rates, see paragraph 4.2.2. For the regressions we refer to table 24. and the appendix of the last chapter.

⁴ We have to remember that the Dutch unmeasured unemployment rate uu_{nl} is computed on the basis of data regarding the disabled who were previously employed in the private sector. In 1990, this was approximately 71 percent of the total number of disabled. In 1976 this ratio was about 81 percent. This indicates a more than proportional increase in the number of disabled who were previously self-employed or in public sector employment. As we have stated before, the Dutch government cannot dismiss employees and it seems that, during the eighties, the disability channel may well have been used to overcome that obstacle.

impact of the disability program is not just significant in the seventies; substantial downward impacts on the Dutch unemployment rate are shown for each period. This clearly indicates that the disability program reduced orthodox unemployment figures for the last two decades. We will return to this point in the next paragraph.

All in all, we can say that the disability patterns of Great Britain and Sweden have not played a significant role regarding the developments of the *Beveridge curve* of these two countries. The Dutch experience is markedly different. The impact of the unmeasured unemployment rate as an indicator of the disability feature is irrefutably significant. The disability program has kept the orthodox Dutch unemployment figures artificially low. Also, as has been shown in section 5.2.2., the adjusted Dutch long-term unemployment ratio has been significant when it comes to explaining the pattern of the adjusted Dutch unemployment rate.

6.3. Long-term Unemployment Patterns.

In this section we will present the most relevant model specifications regarding the developments of long-term unemployment patterns. As only Sweden suffers from the long-term unemployment disease in its mildest form, there is no reason to investigate its pattern. We will therefore focus on the British and Dutch long-term unemployment patterns. By analogy with what we have done previously, we present the model specifications in such a way that it is relatively easy to see what the impact of a certain variable is on the relevant long-term unemployment ratio. We estimate per period that part of the change in the long-term unemployment ratio ($Dlt_{t,t-1}$) that is explained by fluctuations of aggregate unemployment, the replacement ratio, mismatch and policies specifically aimed at reducing the long-term unemployment problem such as the British 'Community Program' and 'Restart Program' and the various Dutch wage subsidies programs. The sum of the impact of these variables, $\Sigma_n [vlt_n]$, is denoted by 'lt-total change' (see table 28.). Thus:

$$Dlt_{t,t-1} = \Sigma_n [vlt_n] \quad (39.)$$

Before we discuss the patterns of the orthodox long-term unemployment ratios, we discuss our findings regarding the adjusted Dutch long-term unemployment ratio. This variable has grown intermittently over the years (see section 4.2.2., table 16. and figure 11.). This is also depicted in table 28. More important

table 28. Explaining Long-term Unemployment Patterns.
(Changes in the Long-term Unemployment Proportion) (*).

Period	Variable (1)	Country\Model Specification			
		The Netherlands		Great Britain	
		(LTNL4.) (2)	(LTNL5.) (3)	(UULTNL5.) (4)	(LTGB4.) (5)
1963- 1971	unem.rate	.0299 (.0167)	.0185 (.0150)		.0300 (.0052)
	rep.rate		.0325 (.0208)		
	occ.mismatch				-.0146 (.0063)
	reg.mismatch				-.0135 (.0068)
	trends	-.0915 (.0185)	-.1603 (.0398)		.0119 (.0047)
	lt-total change actual change in the lt-proportion	-.0616 -.1280	-.1093 -.1280		.0138 .0417
1971- 1980	unem.rate	.1041 (.0582)	.0643 (.0521)	-.0147 (.0094)	.0642 (.0111)
	rep.rate		.0145 (.0093)		
	occ.mismatch				.0000 (.0000)
	reg.mismatch				-.0095 (.0047)
	trends	.0192 (.0039)	.0480 (.0119)	.0840 (.0586)	.0270 (.0107)
	lt-total change actual change in the lt-proportion	.1233 .1273	.1268 .1273	.0693 .0652	.0817 .0582

Period	Variable	(LTNL.4) continued	(LTNL.5) continued	(UULTNL5.) continued	(LTGB4.) continued	
1980- 1986	unem.rate	.1166 (.0652)	.0720 (.0583)	-.0099 (.0063)	.0846 (.0146)	
	rep.rate		-.0470 (.0301)			
	occ.mismatch				-.0117 (.0051)	
	reg.mismatch				-.0041 (.0021)	
	SLP8487	-.0697 (.0317)	-.0554 (.0342)	-.0274 (.0232)		
	CPLT				-.0508 (.0200)	
	trends	.0803 (.0163)	.1575 (.0391)	.0563 (.0393)	.0193 (.0077)	
	lt-total change actual change in the lt-proportion	.1272 .2582	.1271 .2582	.0190 .0789	.0373 .1938	
	1986- 1990	unem.rate	-.0588 (.0329)		.0046 (.0029)	-.1249 (.0215)
		occ.mismatch				.0000 (.0000)
reg.mismatch					-.0095 (.0048)	
SLP8487		.1120 (.0510)		.0440 (.0372)		
SLP8890		-.0508 (.1089)				
HERV				.0000 (.0000)		
CPLT					.0523 (.0206)	
RESTART					-.0206 (.0168)	
trends		.0755 (.0153)		.0353 (.0246)	.0175 (.0070)	
lt-total change actual change in the lt-proportion		.0779 .0965		.0839 .0950	-.0852 -.0855	

Notes on table 28.

- Ad.(*) The numbers in parentheses denote standard deviations. Also, see the notes on table 26, Ad.(*).
- Ad.(1) The variables denote that part of the change in the long-term unemployment ratio explained by variable at hand. So, 'unem.rate', denotes that part of the change explained by changes in the unemployment rate, 'rep.rate' reflects the impact of the replacement ratio, 'occ.mismatch' reflects the impact of occupational mismatch, 'reg.mismatch', reflects the impact of regional mismatch, SLP8487 reflects the wage-subsidies component SLP8487, SLP8890 the wage-subsidies component SLP8890, 'HERV' denotes the dummy representing the disability reform of 1987, 'CPLT' reflects the impact of the 'Community Program', 'RESTART' denotes the 'Restart Program' and 'trends' the impact of the trends. 'lt-total change' denotes the estimated change of the long-term unemployment ratio in a particular period, whereas 'actual change in the lt-proportion' denotes the real change of the long-term unemployment ratio over that period. Thus, 'actual change in the lt-proportion' = $lt_t - lt_{t-1}$. For instance, for the period 1980-1986, 'actual change in the lt-proportion' denotes: $lt_{86} - lt_{80} = \Delta lt_{86} + \Delta lt_{85} + \dots + \Delta lt_{81}$.
- Ad.(2) The dependent variable of model specification (LTNL4.) is lt_{nl} .
- Ad.(3) See, Ad.(2).
- Ad.(4) The dependent variable of model specification (UULTNL3.) is $uult_{nl}$. Thus, 'lt-total change' and 'actual change in the lt-proportion' are regarding the adjusted Dutch long-term unemployment ratio ($uult_{nl}$), and 'unem.rate' denotes the impact of the adjusted Dutch unemployment rate (uw_{nl}).
- Ad.(5) The dependent variable of model specification (LTGB4.) is lt_{gb} .
-

is the fact that most of the variation in the pattern of the adjusted long-term unemployment ratio is explained by the trends. However, as we have seen, in the long-run none of the variables incorporated in model specification (UULTNL5.) were significant. The pattern of the adjusted Dutch long-term unemployment ratio ($uult_{nl}$) is not easily explained which, given the very nature of the series, is understandable. The series contains two parts: the orthodox long-term unemployment and those unmeasured unemployed in the disability stock. If unemployment goes up it is to be expected that long-term unemployment will go up in the long-run as well.

However, there is no such direct correlation between unemployment and unmeasured unemployment in the long-run. Thus, the impact of unemployment on the adjusted Dutch long-term unemployment ratio is not necessarily positive in the long-run, see model specification (UULTNL5.). This explains the downward impact of 'unem.-rate' in the second and third periods, characterized by rising unemployment, and an upward impact in the fourth period with falling unemployment. Apparently the impact of the wage-subsidies has declined over the last period causing a rise in the adjusted long-term unemployment ratio. Evidently, the pattern of $uult_{nl}$ is not easily explained.

Our analysis regarding the orthodox long-term unemployment ratios entails a comparison of the British and Dutch patterns. In particular, the British long-term unemployment pattern is dominated by the movements of aggregate unemployment. In all periods 'unem.rate' turns out to be the most dominant variable. The replacement ratio was completely insignificant as regards the pattern of the British long-term unemployment ratio (lt_{gb}). The impact of occupational and regional mismatch is rather small. More importantly, especially due to a decline in regional mismatch, the mismatch series never have an upward impact on British long-term unemployment. The impact of the labour market policies begins to bite in the last period. The 'Community Program' has an upward impact on lt_{gb} in the last period. This is not surprising given the negative coefficient of CPLT and the fact that the last observation on CPLT was nought (the abandonment of the 'Community Program'). Most disappointing is that, for the years 1980-1986, the estimated change in the British long-term unemployment proportion is nowhere near its real change. Apart from that period, changes in the value of the British long-

term unemployment ratio are reasonably well estimated.

In contrast to the British long-term unemployment pattern the Dutch replacement ratio is significant as regards the Dutch long-term unemployment ratio, whereas it was insignificant regarding Dutch unemployment. However, its impact is not overwhelming. The most dominant variables when it comes to explaining the Dutch long-term unemployment ratio appear to be the trends and not aggregate unemployment. Given the patterns of Dutch long-term unemployment and aggregate unemployment that is not too surprising. As we have seen (tables 4.B. and 8.), in the sixties the Dutch long-term unemployment ratio was relatively high when aggregate unemployment was reasonably low. Also, Dutch long-term unemployment continues to rise up to the end of the sample period, whereas aggregate Dutch unemployment has been falling since 1985. The wage subsidies policies seem to have had a slightly dampening effect on Dutch long-term unemployment in the third period, whereas its impact reduced in the fourth period causing a rise in lt_{nl} . Thus, these policies have not been of striking importance in bringing down Dutch long-term unemployment.

6.4.

Summary.

After the previous sections, the time has come to draw some conclusions as regards the findings of our econometric investigation. We can say that we have not found a clear pattern regarding the Swedish *Beveridge curve*. The functioning of the Swedish labour market is not hampered by problems of long-term unemployment, unmeasured unemployment or financial 'overattractiveness' of the benefit system. The Swedish system has shown a remarkable effectiveness when it comes to preventing unemployment problems. The Swedes have developed a system in which the unemployed are financially reasonably well off. Moreover, the unemployed are guaranteed a job in a training scheme or relief works, thus securing continuous attachment to the labour market. Only if one refuses repeatedly to enlist on one of those schemes is unemployment likely to last for a long time. However, the incentive for any person to do so is limited. Repeated refusal to accept offered employment\training opportunities disqualifies the person from unemployment benefit. The criticism that these relief works and training programs do not offer a full substitute for a job may be partly true. Nevertheless, these 'employment places' keep those enlisted attached in some form to the labour market. Also, comparison of the Swedish open unemployment rate with the British and Dutch unemployment patterns is still very favourable. The 'carrot and stick approach' seems to have worked rather well.

In sharp contrast to the Swedish experience we have large fluctuations in

unemployment during the last thirty years in the British and Dutch labour markets. The question remains whether these fluctuations in unemployment denote a shift of the *Beveridge curve* (we recall and present the British and Dutch *Beveridge curve* at the next page). As we have seen, in particular the long-term unemployment ratio and the unmeasured unemployment rate have an undeniable impact on the Dutch *Beveridge curve*. The significance of long-term unemployment indicates that changes in search intensity and search effectiveness have shifted the Dutch *Beveridge curve* to the right (outwards). Also, the pattern of the unmeasured unemployment rate shows that the developments regarding the Dutch disability arrangements have had a downward effect (shift to the left) on the orthodox unemployment rate over the last two decades. This counterbalances an outward shift induced by declining search effectiveness and of the unemployed.

Regarding the British *Beveridge curve*, we have found the replacement rate and especially the long-term unemployment ratio to be clearly significant. This indicates that a decline in the search effectiveness and search intensity of the British unemployed has shifted the British *Beveridge curve* outwards. It seems (see figures 4.A. and 4.D.), that there has been a slight outward shift of the British and the Dutch *Beveridge curve* at the beginning of the seventies. Another, more substantial, outward shift appears to have taken place at the very beginning of the eighties. During the eighties there appears to have been a loop around this outwardly positioned equilibrium level of unemployment and vacancies. All in all, we can conclude that it is very hard to discern any clear pattern in the Swedish *Beveridge curve*, but that changes in the search effectiveness and search intensity especially have had an impact on the British and Dutch *Beveridge curve*.

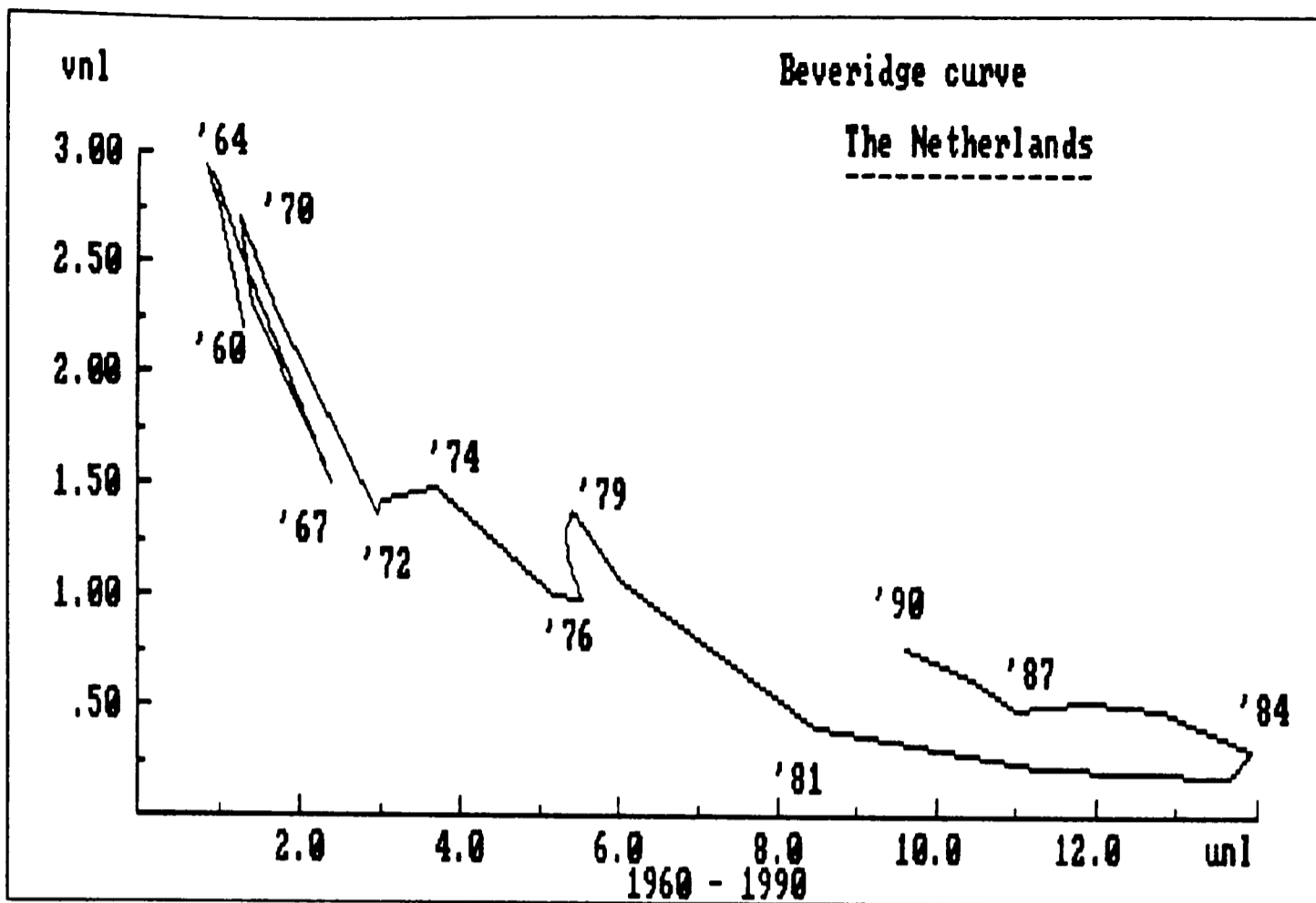


figure 4.A. The Dutch *Beveridge Curve*.

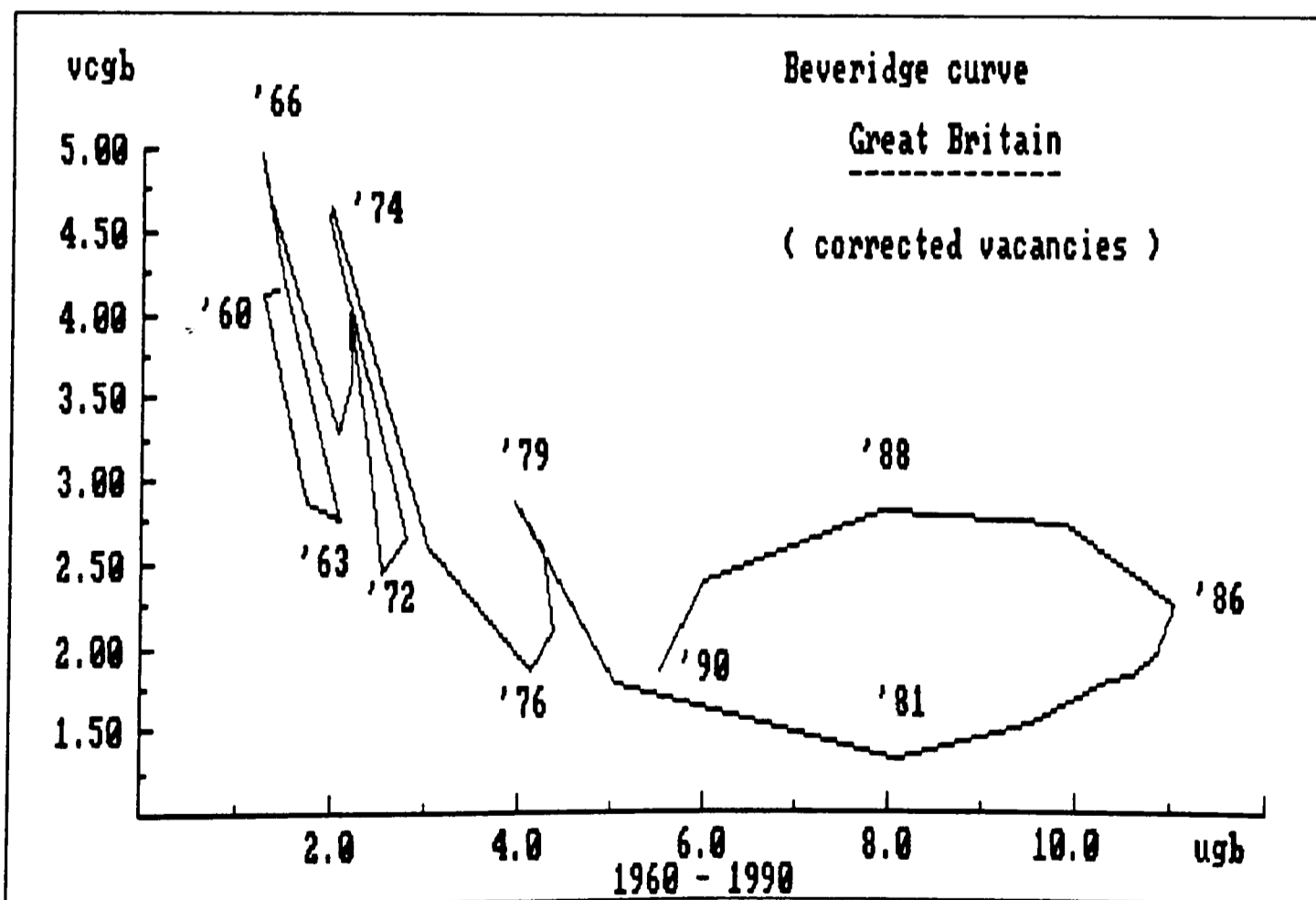


figure 4.D. The Adjusted British *Beveridge Curve*.

The difference in unemployment experience between the three countries can, at least in part, be linked to the differences in attitude and organization of the social security system. As stated above, the Swedish 'carrot and stick approach' has contributed significantly to curbing a possible Swedish unemployment problem.

In contrast to that approach we have the British and Dutch policies. In comparison to the attitude in the Netherlands and Sweden, the British approach is one of 'laissez faire'. The level of benefits is relatively low which tends to reduce the incentive, as well as the opportunity, to abuse the system. However, among those benefits the Invalidity Benefit has proven sufficiently attractive to attract an inflow which cannot be explained by medical reasons alone. In particular, during the eighties the number of IVB recipients has increased substantially. Nevertheless, we have not been able to detect a significant inward shifting effect of any of the constructed British unmeasured unemployment rates on the British *Beveridge curve*.

Also, during the eighties the British authorities toughened their attitude towards the unemployed (another impetus regarding the apparent increase in IVB recipients). Moreover, there are no guarantees given by the government to employ the unemployed. Therefore, fluctuations in unemployment when they do occur, for instance due to a supply shock, have their full effect. There is no provision like the Swedish relief work and training programs, with their countercyclical effect, which could dampen the effect of an adverse supply shock.

The Dutch, like the British, do not have a comprehensive employment guarantee program. However, they do have extensive provisions for those who are not able to get a job. What started as a well meant provision for those who are physically incapable of work, has ended up as a very costly institution for which it

is hard to find a remedy to curb its monstrous size.

As a result of rigid employment protection laws, its relative financial attractiveness, unlimited duration of the benefit, lack of social stigma, and last but definitely not least, the fact that until 1987 those whose chances of a job were bad could be legally⁵ declared (at least partly) disabled, the disability channel has proved to be irresistibly attractive to both employers and employees.

As a consequence, there are now approximately 900 000 persons of working age enlisted on disability benefit in comparison to a working population of six million. The Dutch do not suffer more from diseases than the British and the Swedes, nor is their work environment substantially worse than that of their British and Swedish counterparts. It is therefore no wonder that the unmeasured unemployment rate is significant when it comes to explaining the Dutch unemployment pattern. The existence of the Dutch disability provisions has kept the orthodox unemployment rate artificially low over the last two decades.

To make the impact of the Dutch unmeasured unemployment more clear, we present table 29., which contains a comparison of the most important Dutch model specifications (previously presented in tables 26. and table 27.). As we can see, the incorporation of the unmeasured unemployment rates has a clear downward impact on the Dutch unemployment pattern. The size of the coefficient of 'ltu', denoting the impact of the long-term unemployment problem, decreases but remains significant. Also, when incorporating an unmeasured unemployment rate in the model specification, it is not necessary to incorporate mismatch variables and the

⁵ As has been described in paragraph 4.2.1., the employees of the GMD (the medical service) have 'problems' with applying the more rigorous rules. Consequently, the reform of 1987 did not have its desired effect.

table 29. Explaining Dutch Unemployment Patterns at Constant Vacancies
(Percentage Point Changes in Unemployment) (*).

Period	Variable	(NL5.)	(NL7.)	(NL7.) uusw _{nl}
1971-1980	ltu	2.46	.99	1.40
	occ.mmatch.	.077		
	rep.rate	.29		
	unm.unem.		-4.27	-7.32
	trends	1.09	6.98	9.79
	aggr. unem.			
	total change	4.01	3.69	3.89
	act. change	4.31	4.31	4.31
1980-1986	ltu	10.43	4.19	5.94
	occ.mmatch.	-.13		
	rep.rate	-2.49		
	unm.unem.		-.60	-6.59
	trends	-2.43	1.77	5.99
	aggr. unem.			
	total change	5.37	5.36	5.34
	act. change	5.88	5.88	5.88
1986-1990	ltu		1.26	1.78
	unm.unem.		-.38	-2.91
	trends		-2.36	-.22
	aggr. unem.			
	total change		-1.48	-1.35
	act. change		-2.31	-2.31

Notes on table 29.

Ad.(*) For further details see the notes on tables 26. and 27.

replacement rate, because of the insignificance of these variables.

All in all, we can see the clear inward shifting impact of the unmeasured unemployment rates on the Dutch *Beveridge curve*. If it had not been for the disability provisions and its misuse, the Dutch unemployment figures would have been substantially higher. The outward shift of the Dutch *Beveridge curve* would have been even more substantial. The Dutch disability provisions have been very useful when it came to hiding the real problems at the Dutch labour market. The problems will not be restricted to the labour market. The generous character of the Dutch disability provisions, and the leniency of its administrators have created a financial monster whose impact will be felt over many years to come. The Dutch have forgotten about the stick while providing the carrot in a most generous manner.

Finally, we shall make some concluding remarks regarding the patterns of the long-term unemployment ratio in the three countries concerned. The most important thing which can be said about the Swedish long-term unemployment problem is that it does not seem to exist. This, yet again, is in sharp contrast to the British and Dutch experience. As we have described before, the severity of the long-term unemployment problem in these two countries became apparent during the eighties. In both countries a variety of measures has been introduced to target this problem. With regard to the British long-term unemployment experience two measures in particular seem to have had some success: the 'Community Program' and the 'Restart Program'. The 'Restart Program' especially has been effective in bringing down the number of long-term unemployed persons. However, that success may be due more to a reduction in the number of inappropriate benefit claimants rather than successfully increasing the search effectiveness and search intensity of

the long-term unemployed. The various Dutch measures aimed at the reduction of the long-term unemployment problem seem to have been less successful. Although our indicator of the Dutch effort in this respect (SLP) had a significant downward impact on the Dutch long-term unemployment ratio, especially for the years 1984-1987, the Dutch long-term unemployment ratio has been increasing until the end of our sample period. Apparently, the answer to the problem of long-term unemployment has not yet been found.

7. Epilogue.

It is the function of this concluding chapter to summarise the contents of the preceding chapters. Below, we will discuss the most relevant findings and we compare the labour market developments in Great Britain, the Netherlands and Sweden while emphasizing the 'novelty' and 'robustness' of our results with references to the relevant chapter.

As we have seen, it is not as straightforward as may be desired to measure vacancies and hidden unemployment. We are well aware of the deficiencies of the crude vacancy data, but we have tried to overcome this deficiency by the construction of vacancy correction factors or using vacancy data obtained in a different manner. In this respect, we feel that the main results as presented in the previous chapters do stand firm when we test for its sensitivity in the context of these variations (see the appendix to chapter 5.).

Hidden unemployment is by its very nature hard to measure and not just with respect to the *Beveridge curve*. Nevertheless, we have tried, and not without success, to construct unmeasured unemployment rates and adjusted unemployment rates which capture the size of the hidden unemployment component in the disability stock of the three sample countries. Data on the size of this hidden unemployment component are available with varying degrees of reliability. Nevertheless, in all three countries the trend regarding the hidden unemployment component can be clearly depicted. The Swedes publish data on the disability pensioners retired for

labour market reasons. As regards the Dutch hidden unemployment component there are reliable estimates for its size, whereas the construction of British unmeasured unemployment rates requires some tentative assumptions. However, as stated before, we can here rely on the clear upward trend regarding those pensioners whose employment status is unemployed. This is particularly important when unemployment in the United Kingdom declines in the second half of the eighties, coinciding with an increase in the number of IVB recipients.

Given the above, it is clear that we have faced measurement problems. In the light of these difficulties it is obvious that the *Beveridge curve* is empirically hard to model. However, that should not deter us from trying. Any attempt to analyse the importance of the hidden unemployment feature is bound to face measurement problems, whichever approach is used. The point is, that we are interested in these effects, and consequently we have had to tackle the measurement problems. Moreover, we are interested in the 'true' *Beveridge curve*. If it can be proven that those institutional arrangements had their effect on the structural long-run relationship between unemployment and vacancies, which is the case for one of our sample countries, then that underlines the importance of the problem.

We have investigated the patterns of unemployment and vacancies in the three relevant countries. As was depicted at great length in section 3.2., the patterns of the British and Dutch *Beveridge curve* shown a certain degree of similarity. On the other hand the Swedish labour market experience over the last thirty years is markedly different. This is because of the 'Swedish labour market system' which is best characterised by a combination of employment\training guarantees and tight controls on benefit claimants: the 'stick and carrot' approach.

There are a substantial number of people enlisted on the employment and training programs and because of this the orthodox Swedish unemployment rate is artificially low. The open unemployment rate is approximately a factor 1.6. higher than the orthodox Swedish unemployment rate. It can therefore be argued that the open unemployment rate is the relevant unemployment rate as regards analysis of the Swedish labour market performance (see paragraph 4.3.1.), especially when an international comparison is being drawn. But even then, by international standards, the Swedish unemployment figures are of a low level. The absence of severe unemployment problems in the Swedish labour market is also indicated by the absence of a substantial long-term unemployment problem. Consequently, it not surprising that it is virtually impossible to discern any shift in the Swedish *Beveridge curve*.

How different is the labour market experience of Great Britain and the Netherlands over the last three decades. As we have seen, unemployment in these countries has proved to be very susceptible to supply shocks such as the various oil shocks. An upsurge in British and Dutch unemployment figures took place at the beginning of the seventies and the eighties. The downturn came in 1986-1987 when oil prices fell substantially. Coinciding with these events shifts of the *Beveridge curve* have taken place (see section 3.2.). At the same time another feature appeared on the labour market of Great Britain and the Netherlands: the vast number of people who had been out of work for at least one year (see section 3.4.). Various policies have been tried to curb this problem but so far without lasting effect.

As described at great length in paragraph 1.4.1. (we refer to our discussion w.r.t. the existence of at least some duration dependence as regards long-

term unemployment in that paragraph), the increase in the number of long-term unemployed persons denotes a decline in search intensity and search effectiveness of those out of work. The proxy denoting this effect, the long-term unemployment ratio, has been of crucial significance when it comes to explaining the patterns of the British and Dutch *Beveridge curve* (see chapters 5. and 6.). Another possible factor responsible for the increase in unemployment could have been an increase in persistent structural mismatch. As we have seen, the values of the various mismatch indices (see section 3.3.) were either relatively stable, or declined over time. Not surprisingly therefore, structural mismatch proved not to have a long-run impact on the *Beveridge curve* of Great Britain and the Netherlands, although it had a significant short-run impact. The replacement ratio as an indicator of relative financial well-being of the unemployed also had an impact on the patterns of unemployment in Great Britain and the long-term unemployment ratio in the Netherlands.

Some of the institutional arrangements have affected the patterns of unemployment in one of our sample countries in an unorthodox manner. The previously mentioned Swedish labour market programs aside, we focused on the disability arrangements of Great Britain, the Netherlands and Sweden. In chapter 4., we discussed the disability arrangements of these three countries. As we have seen, there are substantial differences in the organizational structure of the social welfare systems in these countries. The disability arrangements exemplify these differences. The British system is composed of a wide range of different benefits supplementing each other. The provisions are relatively meagre in comparison with their Dutch and Swedish counterparts. Therefore, the British social security provisions do not enhance potential misuse of the system. However, in comparison with other benefits

the Invalidity Benefit has proven to be attractive enough to draw a substantial number of recipients. In particular after 1982, the increase in IVB recipients has been remarkable. During the eighties there has been a substantial increase in those disabled whose employment status is unemployed. The upsurge in unemployment and the relative attractiveness together with a 'rather flexible' attitude of the disability assessors has led to a hidden unemployment component among those in the British disability stock. Its size may not be clearly established, the figures do indicate that it is not of the size of the Dutch hidden unemployment problem. In 1990 there were approximately 1.2 million IVB recipients on a working population of about 28 million people, whereas there are about .9 million disability claimants in the Netherlands on a working population of roughly 6 million persons. Furthermore, tests for the impact of the British unmeasured unemployment rates on the British *Beveridge curve* do not lead to the conclusion that those rates had a significant inward shifting effect on the British *Beveridge curve*.

The Swedish disability provisions are reasonably generous, but the Swedes tend to make sure that abuse of their social security benefits does not happen on a large scale. Nevertheless, some older people are legally allowed, for labour market reasons alone, to retire early through the disability channel. The available figures do not suggest that this happens on a very large scale. The Swedish unmeasured unemployment rate was very low and the unemployment rate corrected for both the labour market programs and the unmeasured unemployed was not very different from the open unemployment rate (see paragraph 4.2.3.).

The Dutch practice regarding the disability arrangements is strikingly different. Ever since the inception of the first major disability act, the WAO, the

number of people claiming disability benefit has risen significantly. At the beginning of the nineties there were approximately 900 000 disability benefit claimants of working age. In a working population of about 6 million Dutchmen that is an incredibly high proportion. In chapter 4., we have described how this situation could arise. The financial and social attractiveness of the benefit for previous employees, the rigid employment laws which could be bypassed by employers by using the disability channel, the disability qualification procedures with the labour market connection and the administrative leniency of the managers and assessors of the scheme have all contributed to the massive growth in the disability stock over the last twenty years. The flow from employment into the disability stock has certainly reduced the flow from employment into unemployment. This feature has kept the Dutch unemployment rate artificially low for the last two decades.

To illustrate our point, we have constructed several variables; the hidden unemployment or unmeasured unemployment rate, the adjusted Dutch unemployment rate and the adjusted long-term unemployment ratio. The size and pattern of all these variables denote the impact of the disability arrangements on the Dutch unemployment pattern (we also constructed these variables for Sweden and Britain, but as we have seen their impact was not significant). These variables were clearly significant when it came to testing their impact on the Dutch *Beveridge curve* (for the robustness of the results we refer to the tables in the appendix to chapter 5.). The unmeasured unemployment proved to have a clear downward effect on the Dutch unemployment pattern and thus an inward shift ('shift to the left') of the Dutch *Beveridge curve*. Also, when we 'correctly' measure Dutch unemployment the shift of the Dutch *Beveridge curve* is almost completely explained by duration

effects denoted by the adjusted Dutch long-term unemployment ratio.

The pattern of the Dutch long-term unemployment is more difficult to explain. The various programs had a downward impact on the figures but the long-term unemployment problem remains sizeable. Clearly, the 'Community Program' and the 'Restart Program' had a decreasing effect on the British long-term unemployment problem. However, aggregate unemployment appears to be the most dominant factor determining the scale of the British long-term unemployment problem. This does not seem to apply to the Dutch long-term unemployment pattern. Dutch long-term unemployment did not fall after 1986 when aggregate unemployment came down, whereas British long-term unemployment figures fell with aggregate unemployment.

All in all, it has been hard to find a clear trend regarding the Swedish *Beveridge curve*. As regards the British *Beveridge curve* the long-term unemployment ratio is clearly significant when it comes to explaining its outward shift. This long-term unemployment effect is incompatible with the absence of duration effects. Long-term unemployment has also been significant when it came to explaining the outward shift of the Dutch *Beveridge curve*. Furthermore, the unmeasured unemployment rate had a significant inward shifting impact on the Dutch *Beveridge curve*. The hidden unemployment component in the Dutch disability stock has kept the orthodox unemployment rate artificially low over the last two decades.

In comparison with the Dutch and the Swedes, the British have a relatively meagre social welfare system and their labour market patterns fluctuate with the patterns of economic prosperity. The Swedes have proven that it is possible to operate a social system which eases the unemployment burdens in a

period of economic lethargy. The Dutch, despite operating a comparably generous welfare system, have not been able to do so. The Dutch have not put the 'carrot and stick' approach into practice. Their aversion to a social welfare system which entails that concept restricts the effectiveness with which government money is being spent. Sadly, the developments regarding the Dutch disability arrangements are the perfect example of this. The disability arrangements in the Netherlands have proven to be very capable of disguising the labour market problems. Once we correct for this anomaly, the severity of these labour market problems becomes painfully obvious.

List of References.

- Aarnio, O. (1989), 'On the Effects of Duration on Finnish Unemployment', Finnish Economic Papers, volume 2, no. 1, pp. 65-81.
- Aarts, L.J.M. and Jong, P.R. de (1990), 'Economic Aspects of Disability Behaviour', Doctoral Thesis, Erasmus Universiteit Rotterdam.
- Aarts, L.J.M. and Jong, P.R. de (1992), 'Het Bedrijf van de Verzorgingsstaat Over Taken en OrganisatieKarakteristieken van een doelmatig Stelsel van Sociale Zekerheid', in De Toekomst van de Welvaartsstaat, Preadviezen van de Koninklijke Vereniging voor de Staathuishoudkunde 1992, pp. 179-208, Stenfert Kroese, Leiden.
- Adema, W. (1987), 'The Government as an Employer of Last Resort', Doctoraal Scriptie (Masters Thesis), Erasmus Universiteit Rotterdam.
- Akerlof, G.A. (1982), 'Labor Contracts as Partial Gift Exchange', The Quarterly Journal of Economics, volume 97, pp. 543-569.
- Alogoskoufis, G.S. and Manning, A. (1988), 'On the Persistence of Unemployment', Economic Policy, volume 7, pp. 427-469.
- Amemiya, T. (1986), 'Advanced Econometrics', Basil Blackwell, Oxford.
- Atkinson, A.B. and Micklewright, J. (1989), 'Turning the Screw: Benefits for the Unemployed 1979-88', in The Economics of Social Security, Dilnot, A.W. and Walker, I. (eds.), pp. 17-51, Oxford University Press, Oxford.
- Atkinson, A.B. and Micklewright, J. (1991), 'Unemployment Compensation and Labor Market Transitions: A Critical Review', Journal of Economic Literature, volume 29, pp. 1679-1727.
- Baena, Duke de (1968), 'The Dutch Puzzle' (fifth edition), L.J.C. Boucher Publishers, The Hague.
- Berg, D.J. van den (1982), 'Specification and Estimation of the Unemployment-Vacancy Curve in the period 1956-1979', De Economist, volume 130, no. 3, pp. 397-419.
- Berg, G.J. van den (1990), 'Search Behaviour, Transitions to Non-Participation and the Duration of Unemployment', The Economic Journal, volume 100, pp. 842-865.
- Beveridge, W.H. (1942), 'Social Services and Allied Services' (the Beveridge Report), Cmnd. 6404, Her Majesty's Stationery Office, London.
- Beveridge, W.H. (1944), 'Full Employment in a Free Society', George Allen & Unwin Ltd., London.
- Björklund, A. (1990a), 'Evaluations of Swedish Labour Market Policy', Finnish Economic Papers, volume 3, no. 1, pp. 3-13.

- Björklund, A. (1990b), 'Unemployment and Income Distribution: Time-series Evidence from Sweden', Institutet för Social Forskning (Swedish Institute for Social Research), Meddelande 3\1990, Stockholm Universitet.
- Björklund, A. and Holmlund., B. (1991), 'The Swedish System', in Labour Market Policy and Unemployment Insurance, Björklund, A., Haveman, R.H., Hollister, R. and Holmlund., B. (eds.), pp. 110-137, Oxford University Press, Oxford.
- Blanchard, O.J. and Diamond, P. (1989), 'The Beveridge Curve', Brookings Papers on Economic Activity, 1, pp. 1-76.
- Bosch, F.A.J. van den and Petersen, C. (1980), 'De Omvang van de Verborgene Werkloosheid in de WAO', Economische Statistische Berichten, pp. 52-58, 1980.
- Bosch, F.A.J. van den and Petersen, C. (1983), 'An Explanation of the growth of Social Security Disability transfers', De Economist, volume 131, no. 1. pp. 67-79.
- Brown, J.C. (1990), 'Victims or Villains?', (Social security benefits in unemployment), Joseph Rowntree Memorial Trust, York.
- Bruno, M. and Sachs, J.D. (1985), 'Economics of Worldwide Stagflation', Basil Blackwell, Oxford.
- Budd, A., Levine, P., and Smith, P. (1985), 'Unemployment, Vacancies and the Long-term Unemployed', Centre for Economic Forecasting discussion paper no. 154.
- Budd, A., Levine, P., and Smith, P. (1988), 'Unemployment, Vacancies and the Long-term Unemployed', The Economic Journal, volume 98, pp. 1071-1091.
- Burgess, S.M. (1989), 'A Model of Competition between Unemployed and Employed Job Searchers: an Application to the Unemployment Outflow Rate in Britain', University of Bristol.
- Burkhauser, R.V. (1991), 'De Ziekte Arbeidsongeschiktheid Alleen Hier Virulent', NRC Handelsblad, 21^e jaargang no. 173, p. 8.
- Calmfors, L. (1991), 'What Can We Learn from the Macroeconomic Experience of Sweden' (paper presented to a symposium in the Hague, December 1991), Institute for International Economic Studies, Stockholm Universitet.
- Calmfors, L. and Driffill, J. (1988), 'Bargaining Structure, Corporatism and Macroeconomic Performance', Economic Policy, volume 6, pp. 13-61.
- Calmfors, L. and Forslund, A. (1991), 'Real-Wage Determination and Labour Market Policies: The Swedish Experience', The Economic Journal, volume 101, pp. 1130-1148.
- Calmfors, L. and Nymoen, R. (1990), 'Real Wage Adjustment and Employment Policies in the Nordic Countries', Economic Policy, volume 11, pp. 397-448.
- Centraal Bureau voor de Statistiek (1986), 'Statistical Yearbook of the Netherlands 1985', Staatsuitgeverij, CBS, 's-Gravenhage (The Hague).

- Centraal Bureau voor de Statistiek (1990), 'Statistical Yearbook 1990 of the Netherlands', SDU uitgeverij, CBS, 's-Gravenhage (The Hague).
- Centraal Bureau voor de Statistiek (1990), 'Statistical Yearbook 1991 of the Netherlands', SDU uitgeverij, CBS, 's-Gravenhage (The Hague).
- Clements, M.P. and Mizon, G.E. (1991), 'Empirical Analysis of Macroeconomic Time series' (VAR and Structural Models), European Economic Review, volume 35, pp. 887-917.
- Commission of the European Communities (1989), 'Comparative Tables of the Social Security Schemes in the Member States of the European Communities' (15th edition), Office for Official Publications of the European Communities, Luxembourg.
- Creedy, J. and Disney, R. (1989), 'Public and Private Partnerships in Social Security: Recent UK Policy', in: The Political Economy of Social Security, Gustafsson, B.A. and Klevmarcken, N.A. (eds.), pp. 211-235, Elsevier Science Publishers b.v., Amsterdam.
- Dalley, G. (1991), 'Disability and Social Policy', in: Disability and Social Policy, Dalley, G. (ed.), pp. 1-19, Policy Studies Institute, London.
- Davidson, J.E., Hendry, D.F., Srba, F. and Yoo, S. (1978), 'Econometric Modelling of the Aggregate Time Series Relationship between Consumers' Expenditure and Income in the United Kingdom', The Economic Journal, volume 88, pp. 661-692.
- Department of Employment (1982), Employment Gazette, 'Compilation of the Unemployment Statistics', September, pp. 389-393, DE, London.
- Department of Employment (1986), Employment Gazette, 'Change in the Compilation of the Unemployment Statistics', March\April, pp. 107-108, DE, London.
- Department of Employment (1988a), Employment Gazette, 'Measures of Unemployment and Characteristics of the Unemployed', October, pp. 534-547, DE, London.
- Department of Employment (1988b), Employment Gazette, 'Unemployment Statistics: Revisions to the Seasonally Adjusted Series', December, pp. 660-663, DE, London.
- Department of Employment (1989a), Employment Gazette Historical Supplement No. 1., April, DE, London.
- Department of Employment (1989b), Employment Gazette Historical Supplement No. 2., November, DE, London.
- Department of Employment (1991a), Employment Gazette, March, DE, London.
- Department of Employment (1991b), Employment Gazette, 'Labour Market Statistics for the 1990s', March, pp. 135-138, DE, London.
- Department of Employment (1991c), Employment Gazette, 'Revised Employment Estimates for September 1987 to September 1990', April, pp. 197-204, DE, London.
- Department of Social Security (1988), 'Occupational Sick Pay Schemes', DSS, Her Majesty's Stationery Office, London.

- Department of Social Security (1990a), 'If You have an Industrial Disease', DSS, Her Majesty's Stationery Office, London.
- Department of Social Security (1990b), 'Industrial Injuries Disablement Benefit', DSS, Her Majesty's Stationery Office, London.
- Department of Social Security (1990c), 'The Way Ahead', (Benefits for disabled people), DSS, Her Majesty's Stationery Office, London.
- Department of Social Security (1991a), 'Social Security Benefit Rates' (Benefit rates, earnings rules and National Insurance contribution rates), DSS, Her Majesty's Stationery Office, London.
- Department of Social Security (1991b), 'Which Benefit?' (A guide to the social security and NHS benefits you can claim), DSS, Her Majesty's Stationery Office, London.
- Department of Social Security (1991c), 'Social Security Statistics 1990', DSS, Her Majesty's Stationery Office, London.
- Department of Social Security (1991d), 'Statutory Sick Pay - Check Your Rights', DSS, Her Majesty's Stationery Office, London.
- Department of Social Security (1991e), 'Sickness Benefit', DSS, Her Majesty's Stationery Office, London.
- Disney, R.H., Bellmann, L., Carruth, A., Franz, W., Jackman, R., Layard, P.R.G., Lehmann, H. and Philpott, J. (1992), 'Helping the Unemployed: Active Labour Market Policies in Britain and Germany', Anglo-German Foundation, London.
- Disney, R.H., and Carruth, A. (1992), 'Helping the Unemployed: Active Labour Market Policies in Britain and Germany' (a summary report), Anglo-German Foundation, London.
- Disney, R.H., and Webb, S. (1990), 'Why Social Security Expenditure in the 1980s Has Risen Faster than Expected: the Role of Unemployment', Fiscal Studies, volume 11, pp. 1-20.
- Disney, R.H., and Webb, S. (1991), 'Why Are There So Many Long-term Sick in Britain', The Economic Journal, volume 101, pp. 252-262.
- Doornik, J. and Hendry, D.F. (1992), 'PC-GIVE 7., An Interactive Econometric Modelling System', Institute of Economics and Statistics, University of Oxford, Oxford.
- The Economist (1990), 'A Change of Course; a Survey of the Swedish Economy, 3rd March.
- The Economist (1991a), 'All, or Almost All, Change', volume 320, no. 7725, p. 60 and p. 65.
- The Economist (1991b), 'Survival of the Fittest Bit', volume 320, no. 7725, p. 65.
- The Economist (1991c), 'Nice Start', volume 321, no. 7728, p. 69.
- Edin, P-A. and Holmlund, B. (1991), 'Unemployment, Vacancies and Labour Market Programmes', in Mismatch and Labour Mobility, Padoa-Schioppa, F. (ed.), pp. 405-448, Cambridge University Press, Cambridge.
- Elsevier (1991a), 'De Ontmanteling van de WAO; Werkgever in de Aanval', 47^e jaargang no. 30, pp. 9-12.

- Elsevier (1991b), 'VUT onder Vuur' (Vervroegde uittreding bestaat over een paar jaar niet meer) , 47^e jaargang no. 48, pp. 41-44.
- Emanuel, H., Halberstadt, V. and Petersen, C. (1984), 'Disability Policy in the Netherlands', in: Public Policy Toward Disabled Workers: Cross-National Analysis of Economic Impacts, Burkhauser, R.V., Halberstadt, V. and Haveman, R.H. (eds.), Cornell University Press, Ithaca and London.
- Engle, R.F. and Granger, C.W.J. (1987), 'Co-integration and Error Correction: Representation, Estimation and Testing', Econometrica, volume 55, pp. 251-276.
- Eurostat (1988), 'Long-term Unemployment' (Its wider labour market effects in the countries of the European Community), Eurostat, Brussel-Luxembourg.
- 'The Existing Social Security System', in Reform of Social Security: Background Papers, Volume 3, pp. 99-123, Cmnd. 9519, Her Majesty's Stationery Office, London.
- Farber, H.S. (1986), 'The Analysis of Union Behaviour', in Handbook of Labor Economics, volume II, Ashenfelter, O.C. and Layard, P.R.G. (eds.), pp. 1039-1089, Elsevier Science Publishers b.v., Amsterdam.
- Floyd, M. (1991), 'Overcoming Barriers to Employment', in: Disability and Social Policy, Dalley, G. (ed.), pp. 210-235, Policy Studies Institute, London.
- Glynn, S. (1991), 'No Alternative?' (Unemployment in Britain), Faber and Faber Limited, London.
- Graafland, J.J. (1991), 'On the Causes of Hysteresis in Long-term Unemployment in the Netherlands', Oxford Bulletin of Economics and Statistics, volume 53, pp. 155-170.
- 'Grondwet voor het Koninkrijk der Nederlanden', Koninklijke Vermande b.v., 1983.
- The Guardian (1991), 'At the end, turn right', 13 September, p. 23.
- Hall, R.E. and Lilien, D.M. (1979), 'Efficient Wage Bargains under Uncertain Supply and Demand', American Economic Review, volume 69, pp. 868-879.
- Haskel, J. and Jackman, R. (1988), 'Long-term Unemployment in Britain and the Effects of the Community Program', Oxford Bulletin of Economics and Statistics, volume 50, pp. 379-408.
- Harris, J. (1977), 'William Beveridge' (A Biography), Clarendon Press, Oxford.
- Hartog, J. and Theeuwes. J. (1991), 'Postwar Unemployment in the Netherlands' (Paper presented to a symposium in The Hague, December 1991), Universiteit van Amsterdam and Universiteit van Leiden.
- Harvey, A.C. (1990), 'The Econometrics of Time Series' (second edition), Philip Allan, London.

- Heckman, J.J. (1991), 'Identifying the Hand of Past: Distinguishing State Dependence from Heterogeneity', American Economic Review (Papers and Proceedings), volume 81, pp. 75-79.
- Heckman, J.J. and Borjas, G. (1980), 'Does Unemployment Cause Future Unemployment? Definitions, Questions and Answers from a Continuous Time Model of Heterogeneity and State Dependence' Economica, volume 47, pp. 247-283.
- Heckman, J.J. and Singer, B. (1982), 'The Identification Problem in Econometric Models of Duration Data', in: Advances in Econometrics, Hildenbrand, W. (ed.), pp. 39-77, Cambridge University Press, Cambridge.
- Heckman, J.J. and Singer, B. (1984), 'A Method for Minimizing the Impact of Distributional Assumptions in Econometric Models Duration Data' Econometrica, volume 52, pp. 271-320.
- Heckman, J.J. and Singer, B. (1985), 'Social Science Duration Analysis', in: Longitudinal Analysis of Labour Market data, Heckman, J.J. and Singer, B. (eds.), pp. 39-110, Cambridge University Press, Cambridge.
- Hedström, P. (1987), 'Disability Pension: Welfare or Misfortune?', in: The Scandinavian Model: Welfare States and Welfare Research, Erikson, R., Hansen, E.J., Ringen, S. and Uusitalo, H. (eds.), pp. 208-220, M.E. Sharpe Inc., New York and London.
- Hendry, D.F. (1986), 'Econometric Modelling with Cointegrated Variables: An Overview', Oxford Bulletin of Economics and Statistics, volume 48, pp. 201-212.
- Hill, M. (1990), 'Social Security Policy in Britain', Edward Elgar Publishing Limited, Aldershot.
- Intermediair (1990), 'Hoe flexibel is de BV Nederland?', 26^e jaargang no. 40 (jubileumuitgave), bijlage (appendix).
- Jackman, R. and Layard, P.R.G. (1991), 'Does Long-term Unemployment Reduce a Person's Chance of a Job? A Time-series Test', Economica, volume 58, pp. 93-106.
- Jackman, R., Layard, P.R.G. and Pissarides, C.A. (1984), 'On Vacancies', London School of Economics, Centre for Labour Economics discussion paper no. 165.
- Jackman, R., Layard, P.R.G. and Pissarides, C.A. (1989), 'On Vacancies', Oxford Bulletin of Economics and Statistics, volume 51, pp. 377-394.
- Jackman, R., Layard, P.R.G., Savouri, S. (1991), 'Mismatch: A Framework for Thought', in Mismatch and Labour Mobility, Padoa-Schioppa, F. (ed.), pp. 44-101, Cambridge University Press, Cambridge.
- Jackman, R., Pissarides, C.A. and Savouri, S. (1990a), 'Labour Market Policies and Unemployment in the OECD', Centre for Economic Performance working paper no. 1210.

- Jackman, R., Pissarides, C. and Savouri, S. (1990b), 'Labour Market Policies and Unemployment in the OECD', Economic Policy, volume 11, pp. 449-490.
- Jackman, R. and Roper, S. (1985), 'Structural Unemployment', London School of Economics, Centre for Labour Economics Discussion paper no. 233.
- Jackman, R. and Roper, S. (1987), 'Structural Unemployment', Oxford Bulletin of Economics and Statistics, volume 49, pp. 9-36.
- Jones, D.R. and Manning D.N. (1992), 'Long-term Unemployment, Hysteresis and the Unemployment-Vacancy Relationship: A Regional Analysis', Regional Studies, volume 26, no. 1, pp. 17-29.
- Judge, G.G., Griffiths, W.E., Carter Hill, R., Lütkepohl, H. and Tsoung-Hao Lee. (1985), The Theory and Practice of Econometrics (fifth edition) John Wiley & Sons, New York.
- Kam, C.A. de, Haan, J. de and Sterks, C.G.M., (1990), De Kerfstok van Nederland (Begrotingstekorten en de last van de staatsschuld), Academic Service, Schoonhoven.
- Kam, C.A. de and Nypels, F. (1990), 'Het Stuwmeer Loopt Over', Intermediair, 26^e jaargang no. 46, pp. 28-33.
- Konjunkturinstitutet (1987), The Swedish Economy, Autumn 1987, (National Institute of Economic Research), Stockholm.
- Lancaster, T. and Nickell, S.J. (1980), 'The Analysis of Reemployment Probabilities for the Unemployed', Journal of the Royal Statistics Society (series A) volume 143, part 2, pp. 141-165.
- Layard, P.R.G., Nickell, S.J. and Jackman, R. (1991), Unemployment (Macroeconomic performance and the labour market), Oxford University Press, Oxford.
- Lindeboom, M. and Theeuwes, J. (1990), Job Duration in the Netherlands: The Co-existence of High Turnover and Permanent Job Attachment, Universiteit van Leiden, revised version.
- McDonald, J.M. and Solow, R.M. (1981), 'Wage Bargaining and Employment', American Economic Review, volume 71, pp. 869-908.
- Meager, N. and Metcalf, H. (1987), 'Recruitment of the Long-term Unemployed', Institute of Manpower Studies, IMS Report no. 138.
- Meyer, B.D. (1990), 'Unemployment Insurance and Unemployment Spells', Econometrica, volume 58, pp. 757-782.
- Ministerie van Sociale Zaken en Werkgelegenheid (1988), Rapportage Arbeidsmarkt 1988, SZW, 's-Gravenhage (The Hague).
- Ministerie van Sociale Zaken en Werkgelegenheid (1990a), Rapportage Arbeidsmarkt 1990, SZW, 's-Gravenhage (The Hague).
- Ministerie van Sociale Zaken en Werkgelegenheid (1990b), Kwartaalbericht Arbeidsmarkt, Derde Kwartaal 1990, SZW, 's-Gravenhage (The Hague).

- Ministerie van Sociale Zaken en Werkgelegenheid (1991), 'Rapportage Arbeidsmarkt 1991', SZW, 's-Gravenhage (The Hague).
- Ministry of Labour (1956), Ministry of Labour Gazette, October, London.
- Molho, I. (1989), 'A Disaggregate Model of Flows onto Invalidity Benefit', Applied Economics, volume 21, pp. 237-250.
- Morris, L. and Llewellyn, T. (1991), 'Social Security Provision for the Unemployed', Social Security Advisory Committee, Research Paper no. 3, Her Majesty's Stationery Office, London.
- Muysken, J. (1984), 'Structurele en Conjuncturele Werkloosheid', Maandschrift Economie, volume 48, pp. 193-217.
- Narendranathan, W., Nickell, S.J., and Stern, J. (1985), 'Unemployment Benefits Revisited', The Economic Journal, volume 95, pp. 307-329.
- Narendranathan, W. and Stewart, M.B. (1989), 'Modelling the Probability of Leaving Unemployment: Competing Risk Models with Flexible Baseline Hazards', Warwick Economic Research Papers no. 331.
- Narendranathan, W. and Stewart, M.B. (1991), 'How Does the Benefit Effect Vary as Unemployment Spells lengthen', Warwick Economic Research Papers no. 375.
- National Audit Office (1989), 'Invalidity Benefit: Report by the Comptroller and Auditor General', Her Majesty's Stationery Office, London.
- Newell, A. and Symons, J.S.V. (1985), 'Wages and Unemployment in OECD Countries', London School of Economics, Centre for Labour Economics Discussion Paper 219.
- Nickell, S.J. (1979), 'Estimating the Probability of Leaving Unemployment', Econometrica, volume 47, pp. 1249-1266.
- Nickell, S.J. (1990), 'Unemployment: A Survey', The Economic Journal, volume 100, pp. 391-439.
- Nickell, S.J. and Wadhvani, S. (1990), 'Insider Forces and Wage Determination', The Economic Journal, volume 100, pp. 496-509.
- NRC Handelsblad (1991a), 'Besluiten Kabinet over WAO, Ziektewet', 21^e jaargang no. 241, p. 1.
- NRC Handelsblad (1991b), 'Ter Veld: Minder Bezuinigen op WAO', 21^e jaargang no. 268, p. 1.
- NRC Handelsblad (1991c), 'SVR Wil Toezicht op WAO Verscherpen', 21^e jaargang no. 268, p. 10.
- NRC Handelsblad (1991d), 'Kok Bepleit Geleidelijk Afschaffen Huidige VUT', 22^e jaargang no. 72, p. 1.
- NRC Handelsblad (1991e), 'Collectieve VUT-regeling Heeft Langste Tijd Gehad', 22^e jaargang no. 72, p. 10.
- OECD (1982), 'Economic Surveys, Sweden', July, OECD, Paris.
- OECD (1985), 'Standardised Unemployment Rates, Quarterly Labour Force Statistics, Sources and Methods', OECD, Paris.
- OECD (1987), 'Employment Outlook 1987', OECD, Paris.
- OECD (1988), 'Measures to Assist the Long-term Unemployed' (Recent experience in some OECD Countries), OECD, Paris.

- OECD (1990a), 'Labour Force Statistics 1968-1988', OECD, Paris.
- OECD (1990b), 'Labour Market Policies for the 1990's', OECD, Paris.
- OECD (1991a), 'Employment Outlook 1991', OECD, Paris.
- OECD (1991b), 'Economic Surveys, the Netherlands', OECD, Paris.
- Olsson, S.E. (1989), 'Sweden', in: Social Welfare in Developed Market Countries, Dixon, J. and Scheurell, P. (eds.), pp. 264-308, Routledge, London and New York.
- Organisatie voor Strategisch Arbeidsmarktonderzoek (1985), 'OSA-Rapport 1985, Werk voor Allen', OSA, Staatsuitgeverij, 's-Gravenhage (The Hague).
- Ours, J.C. van (1991), 'The Efficiency of the Dutch Labour Market in Matching Unemployment and Vacancies', De Economist, volume 139, no. 3, pp. 358-378.
- Ours, J.C. van and Ridder, G. (1991), 'Cyclical Variation in Vacancy durations and Vacancy Flows', European Economic Review, volume 35, pp. 1143-1155.
- Pen, J. (1981), 'De crisis van de Verzorgingsstaat', in Overlevingskansen van de Verzorgingsstaat, Preadviezen van de Koninklijke Vereniging voor de Staathuishoudkunde 1981, pp. 39-80, Stenfert Kroese, Leiden.
- Pissarides, C.A. (1986), 'Unemployment and Vacancies in Britain', Economic Policy, volume 3, pp. 500-559.
- Rehn, G. (1985), 'Swedish Active Labour Market Policy, Retrospect and Prospect', Industrial Relations, 24, pp. 62-89.
- Ridder, G. (1987), 'The Sensitivity of Duration Models to Misspecified Unobserved Heterogeneity and Duration Dependence', Universiteit van Amsterdam, revised version.
- Ridder, G. and Gorter, K. (1986), 'Unemployment Benefits and Search Behaviour, an Empirical Investigation', A & E Report no. 11\86, Faculty of Actuarial Science and Econometrics, Universiteit van Amsterdam.
- Roodenburg, H.J. and Wong Meeuw Hing, W.J.M.L. (1985), 'De Arbeidsmarktcomponent in de WAO', Maandschrift Economie, volume 49, pp. 149-161.
- Rotterdams Dagblad (1991a), 'Pvda Wil Schoon Schip Maken', 1^e jaargang no. 129, p. 1.
- Rotterdams Dagblad (1991b), 'WAO-ingreep Treft Maar Kleine Groep', 1^e jaargang no. 129, p. 3.
- Rotterdams Dagblad (1991c), 'Verbazing over Opstappen Pvda-voorzitter', 1^e jaargang no. 129, p. 3.
- Shapiro, C. and Stiglitz, J.E. (1984), 'Equilibrium Unemployment as a Worker Discipline Device', American Economic Review, volume 74, pp. 433-444.
- Social Security Advisory Committee (1988), 'Benefits for Disabled People: a Strategy for Change', SSAC, Her Majesty's Stationery Office, London.

- Sprenger, W.J. (1990), 'De Verzekeringsgeneeskundige van de GMD over de Gevolgen van de Stelselherziening', Tijdschrift voor Sociale Gezondheidszorg, volume 68, pp. 171-174.
- Standing, G. (1986), 'Unemployment and Labour Market Flexibility; the United Kingdom', International Labour Office (ILO), Geneva.
- Statistisches Bundesamt (1989), 'Statistisches Jahrbuch 1989, für die Bundesrepublik Deutschland', Metzler-Poeschel Verlag, Stuttgart.
- Statistisches Bundesamt (1991), 'Statistisches Jahrbuch 1991, für das Vereinte Deutschland', Metzler-Poeschel Verlag, Stuttgart.
- Statistiska Centralbyrån (1990), 'Statistik Årsbok 1990', SCB, Stockholm.
- Statistiska Centralbyrån (1991), 'Statistiska Meddelanden, Arbetskraftundersökningarna 1980-1990', (Labour Force Surveys 1980-1990), SCB, Stockholm.
- Trouw (1990a), 'Nieuwe Wet Moet Aantallen WAO'ers na 1992 Terugdringen', 48^e jaargang no. 14164, p. 4.
- Trouw (1990b), 'Advies Ambtenaren Grof', 48^e jaargang no. 14166, p. 1.
- Trouw (1991), 'Jaren van Kunst- en Vliegwerk om de WAO', 49^e jaargang no. 14374, p. 13.
- Veen, R.J. van der (1990), 'De Sociale Grenzen van Beleid', Stenfert Kroese, Leiden.
- De Volkskrant (1991), 'WAO Wordt Snel een Lagere Uitkering', 70^e jaargang no. 20354, p. 1.
- Wadensjö, E. (1984), 'Disability Policy in Sweden', in: Public Policy Toward Disabled Workers: Cross-National Analysis of Economic Impacts, Burkhauser, R.V., Halberstadt, V. and Haveman, R.H. (eds.), pp. 444-516, Cornell University Press, Ithaca and London.
- Wadensjö, E. (1985), 'Disability Pensioning of Older Workers in Sweden. A Comparison of Studies based on Time-series and Cross-section Data', Institutet för Social Forskning (Swedish Institute for Social Research), Meddelande 15\1985, Stockholm Universitet.
- Wadensjö, E. (1990), 'Early Exit from the Labour Force in Sweden', Institutet för Social Forskning (Swedish Institute for Social Research), Meddelande 1\1990, Stockholm Universitet.
- Walker, A. and Walker, L. (1991), 'Disability and Financial Need', in: Disability and Social Policy, Dally, G. (ed.), pp. 20-56, Policy Studies Institute, London.
- World Health Organization (1990), 'Is the Law Fair to the Disabled?', (A European Survey), WHO, (WHO Regional Publications. European Series; no.29), Copenhagen.

