Labour Market Flows and Labour Market Policies in the British Isles, Poland and Eastern Germany since 1980

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For Lieselotte Lehmann in memoriam
and
Simonetta di Tommaso

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Abstract

This thesis utilizes flow analyses of the labour market in order to examine two key issues. First, to asses the effectiveness of active labour market policies in Britain, Ireland and Poland. Secondly, it allows us to characterize and quantify movements between labour market states which have been occurring on an unprecedented scale in economies undergoing transition.

Chapters 1 and 2 investigate whether active labour market policies in Britain and Ireland have been instrumental in curing or preventing partial hysteresis due to long-term unemployment. In models of the determination of overall and duration-specific outflow rates from unemployment, the predictive power of active measures variables is tested.

Chapter 3 uses the 'lista 500' panel data set to test the hypothesis that after the decentralizing reforms of the early eighties simple models of profit maximization can explain labour adjustment by large Polish enterprises.

Chapter 4 traces the build up of unemployment in Poland by characterizing the composition and determinants of flows between various labour market states. Traditional flow analysis is amended by dividing the state employment into the sub-states, private and state sector employment, and by emphasizing the institutional framework unique to the Polish labour market in its first stage of transition.

In Chapter 5 a unique panel data set is used to quantify labour market transitions in Eastern Germany in the first year after unification. Multinomial logit regressions are employed to highlight the determinants of the estimated transition rates. The applicability of standard models of labour market transitions to labour markets in transforming economies is also tested.

Chapter 6 uses Voivodship-level aggregate panel data to evaluate passive and active labour market policies in Poland which took shape in 1991 and 1992. We also test for the existence of a well behaved matching technology in the Polish labour market. The methodology of Chapters 1 and 2 is modified to account for the panel nature of the data.

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Introduction

1. <u>Overview</u>

Flow analyses of the labour market have recently undergone a renaissance in mainstream macroeconomics (cf. Blanchard and Diamond (1992)). In this thesis flow analyses will be utilized to examine two key issues of the labour market. First, to assess the effectiveness of labour market policies in Britain, Ireland and Poland. Secondly, to characterize and quantify movements between labour market states which have been occurring in economies undergoing transition.

Chapters 1, 2 and 6 evaluate labour market policies. Chapter 1 develops models of the determination of the overall and duration-specific outflow rates from unemployment for Britain in order to investigate whether the Restart Programme and the Enterprise Allowance Scheme contributed to the lowering of equilibrium unemployment between 1982 and 1992. Chapter 2 looks at the impact of some Active Labour Market Policy (ALMP) measures on the overall and duration-by-age outflow rates from unemployment in Ireland in the eighties . In chapter 6 hiring functions are estimated for Poland, covering the years 1991 and 1992. ALMP measures are included as regressors and their predictive power is tested. This chapter also tries to establish whether a switch from an earnings-related to a flat rate benefit system at the beginning of 1992 affected hirings of the unemployed.

Chapter 3 examines annual net flows of employment in the largest Polish firms after the decentralizing reforms of the early eighties and asks whether the intended transformation of Polish enterprises to profit-maximizers is mirrored by their pattern of labour adjustment.

Chapters 4 and 5 look at gross flows between the different labour market states in Poland and Eastern Germany in the early period of transition from a centrally planned to a market economy.

Since the early eighties, like other western European countries, Britain and Ireland have seen high levels of unemployment . The experiences in the labour market of the two countries were different in so far as in the second half of the eighties Britain's labour market was characterized by the partial hysteresis of unemployment, i.e. persistent unemployment even in the face of an expanding economy, while Ireland had a depressed economy with hardly any vacancies. The rise of long-term unemployment, on the other hand, was an experience shared by the two countries. Both governments tried to combat unemployment and in particular long-term unemployment with many ALMP measures.

The first two chapters evaluate some of these measures. For Britain the Restart Programme, directed at people with an uninterrupted unemployment spell of more than six months and the Enterprise Allowance Scheme will be evaluated. In the Irish case we look at five employment schemes targeting various subsets of the pool of the unemployed (e.g. school leavers or the long-term unemployed). While not all the schemes analyzed in chapters 1 and 2 are directed at the long-term unemployed, the following remarks are confined to highlighting the differing economic functions of measures combatting long-term unemployment in the two countries.

Assuming that long-term unemployment is the main channel of the partial hysteresis of unemployment in Britain, measures fighting long-term unemployment are meant to increase the effective labour supply such that any given level of unemployment exerts stronger downward wage pressure. As downward wage pressure is intensified equilibrium unemployment falls. The British Restart programme is such a measure which tries to increase the effective labour supply by channelling people directly into jobs or, more likely, into search effectiveness enhancing training schemes. Chapter 1 tries to find out whether Restart has predictive power in the determination of overall and duration-specific outflow rates from unemployment, implying an important role for it in the cure of the partial hysteresis of unemployment.

If we look at the economic function of measures combatting long-term unemployment in Ireland, their preventive nature should be stressed. As the economy did not pick up in the eighties, reintegrating "disenfranchised" groups into the effective labour supply might prevent the partial hysteresis of unemployment once future demand for labour rises. Another point which can be learnt from the evaluation of Irish employment schemes deals with the definition of the disadvantaged group of the unemployed outside the labour force which ALMP measures are meant to reintegrate. In an economy with a chronically weak demand for labour many long-term unemployed might be considered by employers for jobs once the economy booms as employers understand that even "good" people can drift into long-term unemployment when the number of vacancies is negligible. Hence, not all long-term unemployed necessarily belong to the disadvantaged group whose members need help in rebuilding their human capital in order to reenter the effective labour supply.

The ALMP measures utilized in Poland in the years 1990 to 1992 were negligible relative to the stock of unemployment for most of the period. Only in the last 4 months of 1992 do we see a statistically significant number of participants in training schemes and public works. The evaluation of these measures in chapter 6, which is confined to 1992, needs to be viewed within the general context of a weak demand for labour in the years 1990 to 1992, expressed in very high U/V ratios and very low outflow rates from unemployment, compared not only with OECD countries but also with other economies in transition. Search effectiveness enhancing schemes might not be very meaningful if employers have only a small number of job offers for the large pool of the unemployed.

The first 'Solidarity' government under Prime Minister Mazowiecki initiated a generous benefit entitlement system under political pressure from the ranks of its "own" trade union. Benefits in 1990 were earnings-related, open ended and did not entail a previous work requirement. As unemployment rose relentlessly in the first two years of the reform, the government adjusted the benefit system out of fiscal necessity. It tightened benefit eligibility criteria, limited in principal the entitlement spell to one year and switched from an earnings-related to a flat rate benefit system. These reforms may have increased the search efforts of some of the unemployed. For reasons mentioned in chapter 6, only the effect of the benefit regime switch on the level of hirings can be investigated econometrically.

For a better understanding of the Polish labour market in transition, an analysis of labour demand by large state own enterprises during the eighties might be useful. After the decentralizing reforms of the early eighties these enterprises were supposed to become profit-maximizers, independent from the centre in their input choices. Investigating their labour adjustment provides a partial answer as to whether the aims of the reforms were achieved. To this purpose, a simple static model of labour demand by a monopolistically competitive firm is utilized in chapter 3. The results of our investigation can also tell us whether the Polish labour market in the eighties was still characterized by the stylized facts of "labour markets" in centrally planned economies, i.e. chronic excess demand for labour, a compressed intra-firm wage distribution and hidden unemployment, or whether it already had moved considerably towards a western-type labour market.

Economic theory predicts that transition from a centrally planned to a market economy involves the reallocation of factors of production on a large scale as prices take on their allocative function. As far as labour is concerned, its reallocation must generate open unemployment in the short and medium term. Estrin and Pissarides (1991) cite reasons for high and persistent levels of unemployment in economies in transition. They see the elimination by the price mechanism of excess labour demand and stabilisation policies as reasons for the rise of open unemployment in the short term. In the medium term high levels of labour mismatch might generate persistent open unemployment as the economy needs to restructure from heavy to light industry and from industry to services. Another source of unemployment in the medium term is the much larger employment share of agriculture compared with Western European countries.

Chapter 4 examines the build-up of Polish unemployment in the first 18 months after the introduction of stabilization and price liberalization policies in January 1990 by the Mazowiecki government. Data on inflows into unemployment are not available for this early period of transition and the flow analysis utilized in this chapter emphasizes the institutional features which had a strong impact on flows between labour market states at this time. Worker managed firms, the existence of a "parallel economy" (explained in chapter 4) and embryonic industrial relations are prominent examples of such institutional peculiarities. In the flow analysis of this chapter is implicit the idea that while economic theory can predict medium and long term outcomes of the transition process, remnants of the previous centrally planned economy are important determinants of this process in the short term. Without a knowledge of the recent past, labour market flows in the initial phase of the transformation cannot be properly explained.

Hard evidence on transitions between labour market states and between sectors within employment is presented in chapter 5. From a unique panel data set of Eastern German workers, covering the period November 1990 to November 1991 a transition base is constructed. While the experiences of Eastern German workers cannot be generalized easily to the workers of other economies in transition, general trends can, nevertheless, be inferred from the estimated transition probabilities and the logistic regressions. From the transition probabilities, inferences seem possible about the transforming distributions of working age population and employment in economies in transition, while the regressions can highlight the main determinants of these transitions.

2. Methodological issues

The non-experimental evaluation of Active Labour Market Policies, like training and job creation measures, is dominated by two approaches.

The first approach looks at earnings of persons who have been on e.g. a training scheme and compares them with the earnings of a control group. Training measures intended to raise the productivity of participants should be mirrored, ceteris paribus, in higher wages relative to persons with similar characteristics who have not been given training. In recent studies sophisticated microeconometric techniques have been applied to panel data in order to ensure that unobservable individual-specific determinants of earnings are controlled for (cf. e.g. Ashenfelter and Card (1985)).

The second approach, known as 'transition methodology', uses flow analysis of macro data to establish the overall effect of a measure on outflows or outflow rates from unemployment. The idea behind this approach, among others formulated by Haskel and Jackman (1988), is that a measure which is administered on a large scale can only be considered effective if there is a statistically significant positive correlation between such a measure and outflows or outflow rates from unemployment. One of the strong points of such an approach is the ability in principal to take account of dead weight loss and substitution effects. For example, if we model the determination of overall outflows or the overall outflow rate from unemployment, a positive impact of a measure can be considered its net effect after all distortions have been accounted for.

Chapters 1,2 and 6 apply 'transition methodology' to Britain, Ireland and Poland respectively, using aggregate time series in the first two chapters and regional panel data in chapter 6. Chapters 1 and 6 are in our opinion a major contribution to the further development of this methodology. In chapter 1 the data are carefully explored and 'distribution free' criteria of model selection and specification are employed to ensure that the estimated results reflect stable economic relationships and not just statistical artifacts of the given sample. In chapter 6 the conventional hiring function, normally applied to time series, is modified for use on regional panel data. Thus modified hiring functions are then used to evaluate Polish passive and active labour market policies. To ensure consistent and efficient estimates General Methods of Moments Estimators or Anderson-Hsiao Estimators are employed.

One recurrent theme in the thesis is the use of data exploration to test the validity of Western theories in the context of a reforming centrally planned economy (chapter 3) or of economies in transition (chapters 5 and 6). Chapter 3 explores the data on labour adjustment to see whether large Polish state owned enterprises behaved in the early eighties like monopolistically competitive profit-maximizers. In chapter 5 the results of the logistic regressions can be used to examine whether standard models of the determination of labour market transitions applied to Western economies can provide a useful starting point for the investigation of labour market flows in a transforming economy. In the estimation of hiring functions, performed in chapter 6, is implicit a test for the existence of a well behaved matching technology between the unemployed and vacancies which, as most economists would argue, can be found in modern Western economies. The existence of such a technology in a labour market in transition cannot be assumed a priori and needs to be empirically investigated. In the Polish labour market for example where U/V ratios are very high this test is certainly necessary.

Chapter 1

The Effectiveness of the Restart Programme and the Enterprise Allowance Scheme

I Introduction

Since the beginning of the 1980's Britain like many European countries has seen high levels of unemployment. One of its most striking features has been its degree of persistence, even in the face of an expanding economy. In the eighties, many programmes were introduced by the British government with the aim to reduce unemployment and to cure its partial hysteresis. We will try to evaluate two such programmes, the Restart programme (Restart) conceived as a tool to combat long-term unemployment, defined as a continuous unemployment spell exceeding 12 months, and the Enterprise Allowance Scheme (EAS) meant to further the creation of small businesses and targeting all unemployed with spells longer than 8 weeks. Time series analysis will be employed to investigate whether these two Active Labour Market Policy (ALMP) measures have an impact on the overall and duration-specific outflow rates from unemployment.

Roughly between 1984 and 1990 we have an expansionary phase in the business cycle and, consequently, a drop in total and long-term unemployment. As one of its main aims, this chapter pursues the question whether Restart has contributed to the fall in total, but above all long-term unemployment, i.e. whether this ALMP measure has been an effective tool in the cure of the partial hysteresis of unemployment.

To see why models of the determination of the overall and duration-specific outflow rates from unemployment are useful in the evaluation of ALMP measures, we first derive a flow-stock relationship for unemployment in the steady state. If A denotes outflows from and I inflows into unemployment during some given time unit and U the stock of unemployment, then in the steady state

$$A = I \Rightarrow U = \frac{I}{\frac{A}{U}}$$

Steady state calculations which we undertake below show that 70% of the fall in the stock of total unemployment between 1984 and 1990 can be attributed to the rise in A/U, the overall outflow rate from unemployment. So, for our sample spanning the period from the second quarter of 1982 to the second quarter 1992, outflow rate analysis could play an important role in the evaluation of ALMP.[1]

White and Lakey (1992), analyzing a sample of the 1989 cohort of Restart interviewees, found a "Restart effect", i.e. Restart interviewees seem to have shorter remaining durations of unemployment than members of a control group. Such a cohort study, while extremely useful, cannot address all issues of interest in connection with Restart. Only aggregate time series analysis can investigate the overall effect on unemployment, e.g. it can detect substitution effects, and, maybe more importantly, can help answer the question as to whether Restart has been instrumental in curing partial hysteresis over <u>the entire expansionary phase</u> of the business cycle.

Some work on the evaluation of Restart using time series has already been undertaken[2]. However, all these studies have the major drawback that only a few data points are available for the regressor variable used to capture Restart. The economic interpretation of the regression results is, therefore, quite difficult, and most likely all these studies just model the <u>initial</u> impact of the Restart programme.

As far as the evaluation of Restart is concerned, the study in this chapter is novel in three respects. First, the time series which we have for Restart covers a much longer period than those of previous studies and goes beyond the peak of the business cycle in 1990.[3] So, our regressions might shed a clearer light on the question of how much the introduction of Restart contributed to the fall in unemployment while the economy expanded. Secondly, we explore the data very carefully to ensure that our measure of Restart is not just a dummy variable proxying for some other labour market policies. This data exploration is complemented by a model selection and specification process which is based on "distribution- free" statistics and on conventional statistics which are derived from regression residuals. Thirdly, steady state simulations allow us to quantify the impact of Restart on the stock of total and long-term unemployment between 1984 and 1990.

While Restart lies at the centre of this study, the impact of the EAS on the overall and duration-specific outflow rates is also investigated. Two major distortive effects can occur with EAS, displacement of output and deadweight loss effects (cf. Stern (1988)). Outflow analysis can only detect the second effect, and we attempt to do this in our study. The other task in connection with EAS will be to quantify the possible impact of this scheme on the stocks of total and long-term unemployment.[4]

Section II gives a description of the Restart programme and the Enterprise Allowance Scheme. Section III develops a simple theoretical framework for the determination of the overall and duration-specific outflow rates from unemployment. This section also discusses both the role of Restart in the cure of partial hysteresis and additional economic insights which can be gained from the analysis of duration-specific outflow rates. Section IV provides the empirical framework in which exploration of the data and model selection and specification takes place. Section V gives our results and section VI offers some conclusions.

II Description of Restart and EAS

The Restart Programme (Restart), begun on a national scale in 1986, offers a counselling interview to any person with an unemployment duration exceeding six months.[5] To fully understand the economic function of Restart and the derivation of the Restart variables, used in this chapter, it is essential to describe in some detail the interviewing process as it occurs in practice.[6]

A letter is sent from local job centres to all unemployed workers whose uninterrupted benefit spell approaches 6 months, inviting the individual to a counselling interview. The letter makes it clear that attending the interview is obligatory for those who want to retain their benefit eligibility. A short questionnaire is attached which the interviewee has to complete and bring to the interview. The questionnaire inquires about (a) job search activities currently pursued, (b) the type of work for which the person considers himself/herself suitable and (c) the interviewee's availability for work. Virtually all those who attend such an interview do this within 3 months of the receipt of the letter, i.e. all participants in the first Restart interview should in principle belong to the 6 - 9 months duration category of the unemployed.[7] People who have a second or subsequent interview are the long-term unemployed, i.e. people who have an uninterrupted spell of unemployment exceeding 12 months.[8] In White and Lakey's cohort those who have a competitive disadvantage in the labour market through chronic illness or low levels of education are most likely to be recalled to a second Restart interview. In most interviews the attempt is made to either (i) refer the unemployed person directly to a vacancy, or (ii) find a position on a training scheme or a short Restart course or (iii) point to the availability of the enterprise allowance scheme. Some interviewees (a small minority according to White and Lakey) are not put through one of the three above mentioned channels. Instead, some of these persons might be put in contact with a Disablement Resettlement Officer, if they are chronically ill. Others, suspected of fraudulent take-up of benefits, are referred to a Claimant Advisor. However, from the available descriptive evidence it seems certain that the Restart programme is only marginally concerned with the detection of benefit "cheats". Its main function is to help those who have genuine difficulties in flowing out of unemployment by providing a "gateway" to a wide range of already existing programmes and services at local employment offices. As Jackman et al. (1986) wrote at its inception, the main aim of the Restart programme is "to help the long-term unemployed take advantage of the job, training and other opportunities open to them. It does not of itself increase those opportunities..." (emphasis added).

The Enterprise Allowance Scheme (EAS) aims at the promotion of enterprise and jobs. According to the Department of Employment, EAS is meant "to encourage unemployed people to start up a business of their own and so to help create new small businesses and new jobs" (Employment Gazette, October 1986). Under the scheme, a person is currently paid an allowance of £40 per week for 12 months if (i) he/she is setting up a new business and has £ 1000 or more to invest in it and (ii) has been unemployed and receiving unemployment benefit (or supplementary benefit) for at least 8 weeks. EAS tries to eliminate the financial disincentive for unemployed people in becoming self-employed which can arise with their loss of entitlement to unemployment benefits.

III Theoretical Framework

1. A simple general model of the determination of the overall outflow rate from unemployment

Modifying the matching models developed by Hall (1979), Mortensen (1982), Diamond (1982), Pissarides (1986), and Jackman and Layard (1991), we derive a class of models describing the determination of the overall outflow rate from unemployment.

We measure A as the number of people leaving unemployment during a period, measure U as the number of unemployed and V as the number of actual vacancies at the beginning of the period. We define ĉ as the average search effectiveness of the unemployed at a given point in time[9], when employment measures meant to enhance search effectiveness are absent. Also let

$$c^* = \hat{c}(1+\alpha M),\ where\ 0 \leq c^* \leq 1\ ,\ M = \sum_{i=1}^{m} \beta_i E_i\ and \sum \beta_i = 1 \qquad (1.1)$$

M is the weighted sum of those employment measures, denoted by E, which do not directly create additional vacancies, but are meant to increase the search effectiveness of the unemployed. On a priori grounds we can assume that $\alpha \geq 0$, i.e. that these employment measures should not lower the average search effectiveness of the unemployed. Finally let

$$V^* = V + \gamma V^P,\ where\ \gamma \geq 0\ ,\ V^P = \sum_{j=1}^{l} \eta_j V_j^P\ and \sum \eta_i = 1 \qquad (1.2)$$

V^P is a weighted sum of vacancies that are generated or potentially generated by public employment, self-employment programmes or wage subsidies during a period.

We then postulate that the number of people leaving unemployment is mainly determined by V^* and the search effective part of the stock of unemployment, i.e.

$$A = f(V^*, c^*U), \; with \; f_1, f_2 > 0 \tag{1.3}$$

Two points need to be made about this outflow function. First, we will only discuss male unemployment here and can therefore be quite certain that the great majority of those in the male working age population who flow from the unemployment register flow into employment.[10] Hence, our outflow function is approximately equivalent to the aggregate matching function as presented e.g. in Blanchard and Diamond (1989). Secondly, matching models are often criticized on the grounds that they neglect the competition for jobs between the employed and unemployed (e.g. Burgess (1989)). While this criticism has merit, it is not very relevant in our context where we want to analyze the additional effects of ALMP on the outflow rate from unemployment. Casual evidence tells us that the unemployed (and most certainly the long-term unemployed) who are helped by ALMP do not compete directly with the employed.[11] Essentially what we want to find out is whether ceteris paribus the hiring of the unemployed has been improved by ALMP.

The assumption that f exhibits CRS in a large labour market (see Hall (1979) and Pissarides (1979)), seems, for Britain at least, to be borne out by empirical evidence (cf. e.g. Jackman and Layard (1991) and Pissarides (1986)), hence (1.3) can be rewritten as

$$\frac{A}{U} = c^* f[\frac{V^*}{c^*U}] \tag{1.4}$$

Log-linearising this last equation we obtain

$$\begin{aligned} \ln\,[\frac{A}{U}] &= \ln c^* + \delta_1 \ln[\frac{V^*}{c^* U}] + \ldots \\ &= \delta_1 \ln[\frac{V^*}{U}] + (1-\delta_1)\ln c^* + \ldots \\ &= \delta_1 \ln[\frac{V}{U}(1+\gamma\frac{V^p}{V})] + (1-\delta_1)\ln[\hat{c}\,(1+\alpha M)] + \ldots \end{aligned} \tag{1.5}$$

For small values of αM and $\gamma(V^p/V)$ we then get the approximation

$$\ln[\frac{A}{U}] = \delta_1 \ln[\frac{V}{U}] + \delta_1[\gamma\frac{V^p}{V}] + (1-\delta_1)\ln\hat{c} + (1-\delta_1)\alpha M + \ldots \tag{1.6}$$

Removing the restriction on the coefficients of ln ĉ and αM and, having quarterly data, specifying a similar structure as in Lehmann (1990) we arrive at the general class of equations which we can estimate

$$\begin{aligned} \ln[\frac{A}{U}] &= \textit{const.} + \textit{seasonals} + \delta_1 \ln[\frac{V}{U}] + \delta_2 \ln\hat{c} \\ &+ \delta_3[\frac{t}{100}] + \sum_{j=1}^{l} \delta_{3+j}\frac{V^{p_j}}{V} + \sum_{i=1}^{m} \delta_{(3+l)+i} E_i + \varepsilon \end{aligned} \tag{1.7}$$

where t/100 is a scaled time trend, $\delta_{(3+l)+i} = \delta_2\alpha\beta_i$ (i=1,....,m), $\delta_{3+j}=\delta_1\gamma\eta_j$ and (for the time being) $\varepsilon \sim (0,\sigma^2)$.

There are many programmes in Britain which attempt to increase the average search effectiveness of all or some sub-pools of the unemployed.[12] The only such programme, however, large enough and covering a prolonged time interval to allow for aggregate time series analysis is the Restart Programme (REST). Two large and prolonged programmes have been in force in Britain which directly generate vacancies: the Enterprise Allowance Scheme (EAS) and the Community Programme.[13] Haskell and Jackman (1988) have analyzed the latter programme (which was terminated in 1988) using the same methodology. Confining, therefore, our analysis to the Enterprise

Allowance Scheme and the Restart Programme we arrive at the equation which, in principal, we wish to estimate

$$\ln[\frac{A}{U}] = const. + seasonals + \delta_1 \ln[\frac{V}{U}] + \delta_2 \ln\hat{c} + \delta_3[\frac{t}{100}] + \delta_4 \frac{EAS}{V} + \delta_5 REST + \varepsilon \tag{1.8}$$

where as above $\varepsilon \sim (0,\sigma^2)$. Its precise specification will be developed below.

2. The function of Restart in the presence of partial hysteresis due to long-term unemployment

In the literature, three main channels of hysteresis or partial hysteresis of unemployment are mentioned: capital constraints (cf. e.g. Bean (1989)), insider-outsider mechanisms (cf. e.g. Blanchard and Summers (1986) and Lindbeck and Snower (1989)) and long-term unemployment (Layard et al. (1991) and Layard (1990b)).

Evaluation of the Restart Programme is embedded within the analysis of partial hysteresis as due to the third channel. An adverse aggregate shock to the economy will generate temporary increased inflows into unemployment. Whilst initially short-term unemployment will rise relative to long-term unemployment, after some lag the duration distribution of unemployment will have more mass in the longer duration categories than before the shock. Ceteris paribus this changed duration structure of unemployment will result in a lower average search effectiveness of the unemployed. As the proportion of long-term unemployment has increased, this lower average search effectiveness of the total stock of unemployment comes about because the long-term unemployed have a lower average probability of flowing into employment than the short-term unemployed (for evidence in Britain and Germany, cf. Disney et al., chs. 5 and 7). In the presence of both heterogeneity and state dependence, factual or (by employers) perceived lower productivity, destruction of human capital and disillusionment with the search process might all contribute to this lower average "escape" probability of the long-term unemployed.[14]

As long as there exists some state dependence, the data generation process underlying unemployment will exhibit partial hysteresis even in the absence of insider power and capital constraints. In the framework of e.g. the Layard-Nickell model (Layard and Nickell (1986,1987) and Blanchard (1988)) the reversal of the shock will not result in a return to the pre-shock NAIRU but in a higher NAIRU for prolonged periods. This is due to diminished downward wage pressure at a given level of unemployment, as some of the long-term unemployed have become "disenfranchised", i.e. no longer belonging to the effective labour supply. It may be that prospective employers use long-term unemployment as a screening device and "weed out" persons with long unemployment spells. Workers' representatives who bargain with employers over wages are more likely to be influenced by the stock of short-term unemployed than by the total stock of unemployed as the long-term unemployed cannot compete effectively for jobs with any of the workers they represent who may enter unemployment. Also, employees engaging in on-the-job-search will only see a sub-pool of the unemployed as potential rivals. As a consequence, the level of unemployment does not exert the amount of downward wage pressure necessary to return quickly to the pre-shock NAIRU. Some ALMP, directed at the supply side of the labour market, are meant to cure this partial hysteresis during the expansionary phase of the business cycle. Such policies aim at the re-integration of some of the "disenfranchised" unemployed into the effective labour supply, thus increasing the search effectiveness of the stock of the unemployed. Downward wage pressure becomes stronger and lower equilibrium unemployment results.

The description of the Restart interviewing process given in section II shows the peculiar nature of Restart among search effectiveness enhancing measures. It helps some people to directly find jobs or self-employment, but it also directs others to training or counselling schemes which in themselves are search effectiveness enhancing programmes. Nevertheless, Restart can be evaluated by adapting the developed general framework to this specific nature of the programme.

Let us rewrite equation (1.1) as follows:

$$\begin{aligned} c^* &= \hat{c}(\boldsymbol{x})[1+\alpha Rest] \\ &= \hat{c}(\boldsymbol{x}) + \alpha\hat{c}(\boldsymbol{x})Rest \end{aligned} \tag{1.9}$$

where c^*, $\hat{c}$ and α have the same meaning as before and the number of Restart interviews is denoted by Rest. The vector **x** has as its elements, determinants of the average search effectiveness of the unemployed. The benefit system and duration structure, but also training and counselling services (apart from Restart) are among others such elements. The formulation of (1.9) then has two implications. First, ceteris paribus, i.e. for a given **x** we can measure the effect of Restart on the overall search effectiveness c^*. Secondly, $\alpha\hat{c}$(x)Rest, the expression for this effect, approximates the impact of Restart well: for a given <u>positive</u> α this impact is greater, the larger $\hat{c}$ and Rest.

Why should $\hat{c}$ enter the formulation of the Restart effect multiplicatively? If e.g. there are low replacement ratios and benefit coverage is limited in time, the unemployed in general and Restart interviewees more readily take the unfilled jobs for which they qualify. The greater the variety of training, retraining and counselling schemes (we exclude Restart here) from which the unemployed benefit and the larger the number of slots on these measures, the greater is the average search effectiveness of the unemployed. But this greater variety and larger number of slots also imply that it is easier to direct the Restart interviewee to that measure which is most appropriate for him/her.

These two examples seem to show the correctness of our multiplicative formulation of the Restart effect. With this formulation we assume that the more conducive the environment is to search efforts by the unemployed in general, the greater is the impact of the Restart programme.

3. The relationship between overall outflow rate and duration-specific outflow rates

To derive the overall outflow rate algebraically, we take advantage of the identity, that the change in the total stock of the unemployed during a period (ΔU_{t+1}) must equal the inflow into unemployment (I_t) minus the outflow from it (A_t) in that period:

$$I_t - A_t \equiv \Delta U_{t+1}, \ hence \tag{1.10}$$

$$[\frac{A}{U}]_t \equiv \frac{I_t - U_{t+1} + U_t}{U_t} \tag{1.11}$$

We define the duration-specific outflow rate, i.e. the proportion of those leaving unemployment in period t+1, after having been unemployed at t for d periods, as

$$[\frac{A}{U}]_{d,t} = P_{d,t} = \frac{U_{d,t} - U_{d+1,t+1}}{U_{d,t}} \ for \ d=1,...,D-2, \tag{1.12}$$

where D is the number of duration categories, and the outflow rate of those who enter unemployment and leave it before the first count (cf. Layard et al. (1991)) as

$$P_{I,t} = \frac{2(I_t - U_{1,t+1})}{I_t} \ ; \tag{1.13}$$

We finally construct the outflow rate of those with unemployment durations longer than

D-1 periods as

$$[\frac{A}{U}]_{d,t} = P_{d,t} = \frac{(U_{d,t}+U_{d+1,t})-U_{d+1,t+1}}{(U_{d,t}+U_{d+1,t})}, \ for \ d=D-1, \tag{1.14}$$

We can then express the overall outflow rate as a linear combination of D duration specific outflow rates.

To demonstrate this with a concrete example let us assume that the stock of the unemployed has 6 duration categories (set D=6):

$U_{1,t}$ = number of people who have been continuously unemployed between 0 and 1 quarter;

$U_{2,t}$ = number of people who have been continuously unemployed between 1 and 2 quarters;

....

....

$U_{5,t}$ = number of people who have been continuously unemployed between 4 and 5 quarters;

$U_{6,t}$ = number of people who have been continuously unemployed for more than 5 quarters.

Now let us use the fact that

$$U_t = \Sigma_d U_{d,t} \tag{1.15}$$

Then,

$$[\frac{A}{U}]_t = \frac{I_t - \Sigma_{d=1}^{6} U_{d,t+1} + \Sigma_{d=1}^{6} U_{d,t}}{U_t} \tag{1.16}$$

So,

$$\begin{aligned}[\frac{A}{U}]_t = & \frac{I_t}{U_t}\frac{I_t - U_{1,t+1}}{I_t} + \frac{U_{1,t}}{U_t}\frac{U_{1,t} - U_{2,t+1}}{U_{1,t}} \\ & + \frac{U_{2,t}}{U_t}\frac{U_{2,t} - U_{3,t+1}}{U_{2,t}} + \frac{U_{3,t}}{U_t}\frac{U_{3,t} - U_{4,t+1}}{U_{3,t}} \\ & + \frac{U_{4,t}}{U_t}\frac{U_{4,t} - U_{5,t+1}}{U_{4,t}} + \frac{(U_{5,t} + U_{6,t})}{U_t}\frac{(U_{5,t} + U_{6,t}) - U_{6,t+1}}{(U_{5,t} + U_{6,t})}\end{aligned} \tag{1.17}$$

Therefore,

$$\begin{aligned}[\frac{A}{U}]_t = & \theta_{I,t}p_{I,t} + \theta_{1,t}p_{1,t} + \theta_{2,t}p_{2,t} + \theta_{3,t}p_{3,t} + \theta_{4,t}p_{4,t} + \theta_{5,t}p_{5,t}, \\ & where\ \theta_{I,t} = \frac{I_t}{2U_t}\ and\ \theta_{1,t} = \frac{U_{1,t}}{U_t}\ ,\ \theta_{2,t} = \frac{U_{2,t}}{U_t}\ etc.\end{aligned} \tag{1.18}$$

Equation (1.18) says that the overall outflow rate is a weighted sum of the duration specific outflow rates, the weights, apart from θ_I, being the proportions of the specific duration stock in relation to the total stock of the unemployed.[15]

This relationship can certainly imply that regressors which have no power in predicting the overall outflow rate may well be important in the prediction of some or all of the duration specific outflow rates. The model which "performs best" in the estimation of (1.8) should, therefore, not necessarily be chosen to estimate duration specific outflow rates.

In general, though, we shall estimate duration-specific outflow rates by a class of equations similar to (1.8)

$$\Delta \ln[\frac{A}{U}]_d = const. + seasonals + \delta_1 \ln[\frac{V}{U}] + \delta_2 \ln s_d + \delta_3[\frac{t}{100}] + \delta_4 \frac{EAS}{V} + \delta_5 REST + \delta_6 \ln[\frac{A}{U}]_{d,-1} + \varepsilon_d \tag{1.19}$$

where d=1,...,5 and the error terms ε_d are assumed to be homoscedastic and uncorrelated over time, but contemporaneously correlated.

The main difference between (1.19) and (1.8) is that we replace $\hat{c}$ with s_d, the "probability to survive" to duration category d.

The terms $\hat{c}$ and s_d serve essentially the same purpose, i.e. to control for differences in search effectiveness amongst the unemployed. As already mentioned, such differences may arise from two causes, heterogeneity or state dependence. Let us recall what these two different hypotheses imply for the interpretation of $\hat{c}$ and s_d.

If there were no heterogeneity and the differences in the search effectiveness of the unemployed were explained purely by the length of time for which people had been unemployed (pure state dependence), then there would be no role for s_d in the duration specific outflow equations, while in the aggregate outflow equation $\hat{c}$ would depend only on the duration structure of the unemployment stock. If, at the opposite extreme, there were no state dependence, and the differences in the search effectiveness of the unemployed were explained entirely by heterogeneity, then s_d would have a positive effect on the duration specific outflow equations while, at least in the steady state, there would be no role for $\hat{c}$ in the aggregate equation. The first of these effects arises because, with heterogeneity, the "better" people leave unemployment first, so the greater proportion of the original entry cohort surviving to a given duration, the better their average quality. The second of these effects arises because in a steady state and in the absence of state dependence the average quality of the stock of the unemployed people is, on reasonable assumptions, invariant with regard to the aggregate unemployment rate (Jackman and Layard (1991)).

If, as one would expect in practice, there exists both heterogeneity and state dependence we would expect to see both a role for $\hat{c}$ in explaining the overall outflow rate and a role for s_d in explaining duration specific outflow rates. The former reflecting the effect of state dependence and the latter the effect of heterogeneity.

The analysis of duration-specific outflow rates can give important additional insights when evaluating ALMP.

The effectiveness of a measure against long-term unemployment can be assessed not only by looking at its impact on outflows from long-term unemployment, but also by investigating its capacity to slow down inflows into long-term unemployment. Note that in the steady state

$$U_L = \frac{I_L}{(\frac{A}{U})_L} \tag{1.20}$$

where we have adapted the steady state equation of section I to long-term unemployment. Also note that, employing our duration structure,

$$\begin{aligned} U_{4,t+1} &= U_{3,t}(1-p_{3,t}) \\ U_{5,t+2} &= U_{4,t+1}(1-p_{4,t+1}) \end{aligned} \tag{1.21}$$

Under the assumption, used by Haskell and Jackman (1988), that

$$I_{L,t+1} = \frac{1}{2}(U_{4,t+1}+U_{5,t+2}) \tag{1.22}$$

it becomes clear that, given an initial stock $U_{3,t}$, $p_{3,t}$ and $p_{4,t+1}$ determine the inflow into long-term unemployment at time t+1.

A policy measure which encompasses all the unemployed with spells longer than six months might be more effective in reducing the stock of long-term unemployment than a measure which only targets the long-term unemployed. In the presence of pure heterogeneity, low outflow rates for groups with longer spells are a function of the composition of the unemployed, while when we have pure state dependence, such low rates are caused entirely by the unemployment experience. A measure targetted at only the long-term unemployed will in the former case exclude many of those that are still in shorter duration categories, but should be targetted, while in the latter case such a measure will have found the ideal target group (cf. Pissarides and Haskel (1987)). Therefore, when both, heterogeneity and state dependence, are causes of lower average search effectiveness of those with longer unemployment spells, a measure also targetting lower duration categories can, ceteris paribus, lower inflows into long-term unemployment and thus more rapidly reduce the stock of the long-term unemployed. In this context, Restart might be an especially potent measure of average search effectiveness enhancement as it targets not only the long-term unemployed but also shorter duration categories.

The analysis of duration-specific outflow rates can also be used to discuss distortive effects of ALMP. For heuristic purposes assume there are two duration categories, short-term and long-term unemployment, let a_S and a_L be the outflow rates from short-term and long-term unemployment, M_L a measure targeted at long-term unemployment and I equal inflows into unemployment. Ceteris paribus, the following partials describe the usual distortive effects of ALMP:

(a) substitution effect $\rightarrow \partial a_S/\partial M_L < 0$;

(b) deadweight loss $\rightarrow \partial a_L/\partial M_L = 0$;

(c) displacement of output effect $\rightarrow \partial I/\partial M_L > 0$.

The last effect, which in the case of EAS is of the first order according to Stern (1988) cannot be assessed with the help of outflow analysis, while dead weight loss and substitution effects can in principle be detected by it. For example, in those equations which estimate outflow rates for targeted duration groups, insignificant coefficients on the EAS variable might imply dead weight loss. The Restart programme, on the other hand, not generating actual vacancies, can only exhibit substitution effects. A significant negative coefficient on the Restart variable in equations connected with short spells of unemployment might point to such effects. There are strong a priori reasons why the Restart programme might generate substitution effects. Restart interviewees are not directly placed into a job or put on training schemes, instead they are advised how to apply for possible vacancies and training schemes. They will then compete with some of the very short-term unemployed, i.e. individuals in U_1, for vacancies and training scheme slots. Thus a partial "crowding out" of the very short-term unemployed by Restart interviewees is plausible.

In the evaluation literature which uses time series analysis, one important issue of contention is whether a variable representing a specific measure is actually a proxy for something which has nothing to do with this measure. In the case of Restart e.g., Dicks and Hatch (1989) find that their Restart variable might well be a proxy for the tighter benefit eligibility criteria which were gradually introduced between 1986 and 1988, since in a regression determining the level of short-term unemployment (in their case defined as an uninterrupted spell of less than six months) the coefficient on the Restart variable is negative and significant.

In our analysis of duration-specific outflow rates we are able to test whether our Restart variable proxies for tighter benefit eligibility criteria or whether it truly measures the Restart effect. When estimating a system of equations like (19) significant positive coefficients on a Restart variable for both the two shortest outflow rates p_1 and p_2 would be a strong indication that this variable carries information not directly linked with the Restart process.[16]

IV Empirical Framework

1. The econometric implementation of the evaluation of labour market policies in Britain using transition methodology

For the model of the overall outflow rate from unemployment, write the vector of N quarterly observations on ln (A/U) as **y**, the matrix of k covariates as **X**, the k parameters and N error terms as the vectors ξ and ε. The most general model (equation (1.7)) is therefore in matrix form

$$y = X\xi + \varepsilon, \ \varepsilon \sim (\mathbf{0},\sigma^2 I) \tag{1.23}$$

To evaluate labour market policies we perform the following relevant partition of (1.23)

$$y = [\ X_1\ X_2\ ]\ [\ \begin{matrix}\xi_1 \\ \xi_2\end{matrix}\ ] + \varepsilon, \ \varepsilon \sim (\mathbf{0},\sigma^2 I) \tag{1.24}$$

Here $\mathbf{X}_1$ is the matrix of regressors of the Jackman-Layard model (Jackman and Layard (1991), $\mathbf{X}_2$ the matrix of employment measure variables, with ξ_1 and ξ_2 the corresponding parameter vectors. For $\xi_2 = \mathbf{0}$ we get the Jackman-Layard model

$$y = X_1\ \xi_1 + \varepsilon, \ \varepsilon \sim (\mathbf{0},\sigma^2 I), \tag{1.25}$$

which we call Model 0. The evaluation of active labour market policies using transition methodology then simply consists of an attempt to investigate, whether some regressors in X_2 are essential to the determination of ln (A/U) and whether, for the sample in question, some augmented model supersedes Model 0 under clearly defined statistical criteria.

Consider a general econometric model of the determination of duration-specific outflow rates. Assume that the set of regression equations given by (1.19) has the following underlying error structure: for ε_{it} and ε_{js} $E(\varepsilon_{it},\varepsilon_{js})=\sigma_{ij}$ for s=t, and $E(\varepsilon_{it},\varepsilon_{js})=0$ for s#t (i,j = 1,..,5). This assumption of contemporaneous correlation of the disturbances is reasonable: at the same point in time the duration-specific rates are exposed to the same random shocks or have similar unobserved determinants. We can write the disturbance related set of regressions by stacking the 5 y vectors and error vectors and by constructing a block diagonal regression matrix, where the diagonal blocks are the regression matrices of the individual equations. For N quarterly observations and k regressors, we then get the following model (cf. Judge et al. (1985), ch. 12):

$$y = X\,\zeta + \varepsilon, \textit{ where } E[\varepsilon\varepsilon'] = \Phi = \Sigma \otimes I \tag{1.26}$$

and the dimensions of y,X,ζ and ε are (5N $\times$ 1), (5N $\times$ 5k), (5k $\times$ 1) and (5N $\times$ 1) respectively. Furthermore

$$\Sigma = \begin{bmatrix} \sigma_{11} & \sigma_{12} & \sigma_{13} & \sigma_{14} & \sigma_{15} \\ \sigma_{12} & \sigma_{22} & \sigma_{23} & \sigma_{24} & \sigma_{25} \\ \sigma_{13} & \sigma_{23} & \sigma_{33} & \sigma_{34} & \sigma_{35} \\ \sigma_{14} & \sigma_{24} & \sigma_{34} & \sigma_{44} & \sigma_{45} \\ \sigma_{15} & \sigma_{25} & \sigma_{35} & \sigma_{45} & \sigma_{55} \end{bmatrix} \tag{1.27}$$

Finally, assume that Σ is positive definite and hence nonsingular.

The estimator of ζ, based on this model when Σ is unknown, is referred to as Zellner's "seemingly unrelated regression" (SUR) estimator and given by

$$\hat{\zeta}_{SUR} = [X'(\hat{\Sigma}^{-1} \otimes I)X]^{-1} X'(\hat{\Sigma}^{-1} \otimes I)y$$
$$\textit{with } \hat{\Sigma} \textit{ being based on the OLS residuals } \hat{\varepsilon}_i = y_i - X_i\hat{\zeta}_i, \qquad (1.28)$$
$$\textit{having elements } \hat{\sigma}_{ij} = \frac{1}{N}\hat{\varepsilon}'_i\hat{\varepsilon}_j \quad i,j = 1,\dots,5$$

2. <u>The data and econometric issues</u>

Figure 1.1 shows moving averages of A/U, $\hat{c}$ and V/U for the period 1982 - 1992. We have excluded the first 2 years of the eighties when the levels of A/U and V/U fell dramatically. Since we are interested in the effect of the introduction of the labour market measures EAS and Restart, with the former begun in 1982 and the latter in 1986, it seems legitimate to impose the above time limits on our sample. More importantly, if we include data points previous to 1982 it becomes unclear whether A/U and V/U are <u>for the given sample</u> stationary variables or whether they are I(1). For longer quarterly time series of A/U and V/U (covering the period from 1967 to 1990), where the performed tests are quite powerful, Ardeni and Lehmann (1992) find some evidence that these variables are not stationary and that the estimation of outflow rate models in levels might be inappropriate. Inspection of Figure 1.1, on the other hand, leads to the conclusion that for the chosen sample period the variables in question are I(0).[17]

In Figure 1.2 moving averages of duration-specific unemployment outflow rates are plotted. As expected the longer the uninterrupted spell of unemployment the lower the outflow rate. Furthermore, the data appear to be stationary.

Comparing Figures 1.1 and 1.2, for many data points the overall outflow rate <u>(note: a weighted sum of duration-specific outflow rates)</u> is at least as large as P_1, the shortest duration-specific outflow rate which we can observe. This relationship between the two rates is sensible, though, since for most data points the estimate of the outflow rate P_I, which cannot be directly observed, happens to be much higher than P_1. With the weights of the former outflow rate (I/2U) somewhat smaller than the weights of the latter (U_1/U) throughout the sample, the level of P_I must be very high (or certainly higher than that of P_1) for most data points to explain the similar levels of P_1 and A/U.[18] Also during the period when the overall outflow rate shows a substantial rise (between 1986 and 1990), two of the duration-specific outflow rates which are potentially affected by Restart, i.e. P_3 and P_5 show a much greater percentage increase than the other rates, while P_4 has only a very slight upward trend.

In the appendix we discuss the quarterly series for total unemployment, duration-specific levels of unemployment, vacancies and inflows into unemployment on which A/U, V/U and P_d (d=1,..,5) are based. There are no simultaneity problems with the latter variables, since, as already mentioned, A and A_d represent flows during a quarter while the stocks of unemployment and vacancies are measured at the beginning of the quarter. An extended description of the construction of $\hat{c}$ can be found in the appendix of Jackman and Layard (1991). However, in order to show that $\hat{c}$ does not create a simultaneity bias we briefly touch upon its construction here. Let 1985q2 be the steady state quarter; $\hat{c}$ is then constructed as the weighted sum of <u>steady state</u> duration-specific outflow rates, where the weights are analogous to those in (1.18), i.e. if $\phi_I=P_{I,85(2)}$ is the steady state outflow rate for those who leave the register within 3 months of entering unemployment and if $\phi_d=P_{d,85(2)}$ (d=1,...,D) is the steady state outflow rate for the d-th duration category of unemployment,then

$$\hat{c}_t = \frac{I_t}{2U_t}\phi_I + \sum_d \frac{U_{d,t}}{U_t}\phi_d \tag{1.29}$$

The ϕ's are constants here. Since we multiply these constants with stocks measured at the beginning of the period (apart from I/2U), the inclusion of $\hat{c}$ into the regression should not pose simultaneity problems.[19] The construction of the "survival probabilities", s_d (d=1,..,5), uses lagged inflow into unemployment data and contemporaneous and lagged stock data[20], so again no simultaneity bias can occur because of these variables. To be able to estimate (1.8) with OLS and (1.19) with SUR we need to finally investigate the exogeneity of the labour market measures.

The EAS measure is plotted in Figure 1.3. This measure is given by EAS slots filled per period for both men and women divided by total number of vacancies. As can be seen, this measure is very small, i.e. filled EAS slots are tiny relative to vacancies. As the number of eligible unemployed comprises all duration categories with the exception of the shortest and the level of vacancies is for all data points smaller than the stock of male unemployment, the EAS flows are negligible relative to the eligible stock of unemployment. This measure can therefore for all practical purposes be treated as exogenous.

In the case of Restart, which is a large programme the endogeneity problem cannot be dismissed that easily. In principal every person approaching an unemployment duration of six months has to attend a Restart interview. Also, the larger the stock of long-term unemployment the more follow-up Restart interviews we might expect per quarter. An endogeneity problem might arise, because the more mass there is in the higher duration categories of the unemployment distribution the lower the outflow rate from unemployment. Thus the number of Restart interviews might depend on the overall outflow rate from unemployment.

We deal with this problem not by trying to instrument the Restart variables, but rather by "normalizing" the number of Restart interviews by the stock of eligible participants. Let the number of imputed Restart interviews for males during quarter t for people with uninterrupted unemployment spells longer than 6 but less than 9 months be $Rest_{6+,t}$, the corresponding number for males with continuous unemployment spells longer than 12 months be $Rest_{12+,t}$ and denote long-term unemployment as $U_{L,t}=U_{5,t}+U_{6,t}$. We, then, define three participation categories of Restart with respect to the unemployment duration stocks, Restart-Short, Restart-Long and Restart-Total as follows:

$$
\begin{aligned}
Rest_{S,t} &= \frac{Rest_{6+,t}}{U_{3,t}}; \qquad Rest_{L,t} = \frac{Rest_{12+,t}}{U_{L,t}}; \\
Rest_{T,t} &= \frac{(Rest_{6+,t}+Rest_{12+,t})}{(U_{3,t}+U_{L,t})}
\end{aligned}
\tag{1.30}
$$

These measures[21], which can be treated as exogenous[22], are shown in Figure 1.4. $Rest_L$ and $Rest_T$ start in the third quarter of 1986, and $Rest_S$ in the second quarter of 1987. Since a very high percentage of all male unemployed with a spell between 6 and 9 months are participating in a Restart interview before the 9 months threshold (White and Lakey (1992), $Rest_S$ should take on values less than but close to one. However, it can, of course, only be an estimate of the proportion of the eligible male unemployment population participating in a first Restart interview. There are various reasons why this estimate might be imprecise. First, the partition of the number of Restart interviewees into $Rest_{6+}$ and $Rest_{12+}$ is only available on an annual basis and we assume that within the annual intervals given in footnote 8 the partition remains the same. Secondly, we would, ideally, need the duration structure of unemployment at bi-weekly intervals, as lists of potential Restart participants are compiled every two weeks. The duration structure is accessible on a quarterly basis, so if we "normalize" by U_3 we cannot take account of a possibly shifting duration structure during the quarter which will affect $Rest_{6+}$. Thirdly, from the available evidence one cannot conclude with certainty that all those who participate in a first Restart interview fall into the duration category U_3. Even though one might think it unlikely, it may be that for some quarters there is a small, but nevertheless statistically significant group of first Restart interviewees who fall into the duration category U_4. Finally, for the cohort of 1989 White and Lakey detect a statistically significant "Early Restart Effect" for females but not males. Some women upon receipt of the invitation to a first Restart interview seem to exit the labour force. The number of men participating in a first Restart interview during a quarter is imputed on the basis of the partition of U_3 by gender. So, if there indeed exists an "Early Restart Effect" for women but not men, we understate $Rest_{6+}$ and thus $Rest_S$.

While the first two sources of imprecision generate a bias in the measurement of $Rest_S$ whose direction cannot be determined, the third source implies an upward and the fourth source a downward bias.

The variable $Rest_L$ is measured imprecisely only because of the first two sources, while there might be measurement problems with $Rest_T$ because of sources two, three and four. Inspection of Figure 1.4 seems to indicate that $Rest_T$ is almost perfectly collinear with $Rest_L$. This is confirmed by auxiliary regressions involving the two variables[23]. This must mean that when ($Rest_{6+}$+$Rest_{12+}$) is "normalized" by (U_3+U_L) the two biases attributable to $Rest_{6+}$ cancel each other out.

Given the magnitude of the Restart programme we do not believe that measurement error poses a major problem in the estimation of overall and duration-specific outflow rates. At any rate, we can be quite certain that $Rest_T$ is least affected by measurement error as the biases in this measure of Restart due to sources three and four are in opposite directions.

When investigating the effectiveness of Restart and EAS we are interested in seeing whether these variables carry information about economic behaviour which has an impact on outcomes in the labour market. When estimating outflow rates it is important to ensure that the empirical results are not entirely dependent on some sample specific statistical artifacts. Two such artifacts come to mind. All the measures for Restart, but especially $Rest_S$, are characterized by initial dramatic "jumps" as the empty cells before the introduction of the programme are filled with zeros. But, when modelling the effect of Restart on outflow rates from unemployment we would like to be sure that our measures are not just proxies for the initial impact of the introduction of the programme which might e.g. be closely linked with a once and for all "shake out" of dubious benefit claimants in 1986/87 (cf. Disney et al. (1992), ch.6). Instead, our measures should reflect the effect of Restart throughout the entire period under consideration.[24] Secondly, there is the possible existence of "influential points" which lower the predictive power of a regression equation. Inspection of Figures 1.3 and 1.4 shows that it is worthwhile to investigate the existence of "influential points" for both Restart and EAS.

The existence of "jumps" and "influential points" in the data has two important implications. From a purely statistical point of view, the underlying data generation process might not be regular enough to warrant e.g. OLS estimation and/or distributional assumptions of normality. For the purpose of the evaluation of labour market measures such irregularities in the data could lead to wrong notions about the effectiveness of these measures.

3. Testing for "smoothness" and normality of the data and model selection

It is in general considered good methodology, when judging the merit of specific models, to take performance criteria into account which do not depend on distributional assumptions. From a general class of models, derived from economic theory, that model should be chosen which performs best under such "distribution-free" criteria.

One such performance criterion is the estimate of the mean squared prediction error, using complete cross validation, which we denote by $\hat{E}_{ccv}$. Define b(**X**) as the OLS predictor. Remove (y_n, X_n) and get $b_{-n}(\mathbf{X})$, then $\hat{E}_{ccv}$ is defined as

$$\hat{E}_{ccv} = \frac{1}{N} \Sigma_{n=1}^{N} [y_n - b_{-n}(X_n)]^2 \tag{1.31}$$

Calculate $\hat{E}_{ccv}$ for all possible models in the general class and choose that model which minimises $\hat{E}_{ccv}$.

While such a selection procedure is desirable for many data sets, the criterion $\hat{E}_{ccv}$ is especially useful in our particular case, where we are not certain about the regularity of the process underlying the data. To understand the usefulness of $\hat{E}_{ccv}$ in deciding whether e.g. normality assumptions and/or OLS estimation procedures are appropriate[25], some theoretical background needs to be presented.

Let **H** be the projection matrix $\mathbf{X}(\mathbf{X}'\mathbf{X})^{-1}\mathbf{X}'$, i.e. $\hat{\mathbf{y}} = \mathbf{H}\mathbf{y}$, and let h_n be the n-th diagonal element in **H**, $h_n = \mathbf{H}_{nn}$. Denote the n-th residual by $r_n = y_n - b(\mathbf{X}_n)$ and the n-th deleted residual by $r_{-n} = y_n - b_{-n}(\mathbf{X}_n)$, hence

$$\hat{E}_{ccv} = \frac{1}{N} \Sigma_{n=1}^{N} (r_{-n})^2 \tag{1.32}$$

The basic theorem which allows us to relate $\hat{E}_{ccv}$ and the distributional characteristics of a data set is given below. Its proof is rather lengthy and omitted.[26]

Theorem:

$$r_{-n} = \frac{r_n}{1-h_n} \tag{1.33}$$

Corollary:

$$\hat{E}_{ccv} = \frac{1}{N}\Sigma_{n=1}^{N}[\frac{r_n}{1-h_n}]^2 \tag{1.34}$$

When $h_n \approx 1$, we obtain "influential points" which reduce the predictive power of an equation. More importantly, in the absence of such points $\hat{E}_{ccv}$ is approximately equal to an adjustment factor times the Mean Residual Sum of Squares,

$$MRSS = \frac{1}{N}\Sigma_{n=1}^{N}[y_n - b(X_n)]^2 \tag{1.35}$$

Note that when k is the number of regressors, the projection matrix **H** has rank k and k eigenvalues equal to 1 and N-k eigenvalues equal to 0. Therefore,

$$\Sigma_{n=1}^{N} h_n = trace(\boldsymbol{H}) = k \tag{1.36}$$

But

$$\Sigma_{n=1}^{N} h_n = k \Rightarrow \bar{h} = \frac{k}{N} \tag{1.37}$$

Now assume that $h_n \approx \bar{h}$, then

$$\begin{aligned}\hat{E}_{ccv} &= \frac{1}{N}\Sigma_{n=1}^{N}[\frac{r_n}{1-h_n}]^2 \\ &\approx \frac{1}{N}\frac{1}{(1-\bar{h})^2}\Sigma_{n=1}^{N} r_n^{\,2} \\ &= \frac{1}{N}[\frac{1}{1-k/N}]^2\Sigma_{n=1}^{N} r_n^{\,2}\end{aligned}$$

So finally,

$$\hat{E}_{ccv} \approx \frac{N}{(N-k)^2} RSS \tag{1.38}$$

When (38) holds approximately, i.e. under the assumption that $h_n \approx \bar{h}$, we can be quite certain, that the data are generated by some regular distribution (normal or uniform). Inspection of the values of h_n, n=1,...,N, and comparing the LHS of (38) with its RHS should give some definite clues as to whether the underlying data generation process is normal or not, and whether we can have confidence in the usual test results associated with OLS estimation.

Without a priori distributional assumptions about the data we cannot construct confidence intervals for

$$\hat{E}_{ccv} - \frac{N}{(N-k)^2} RSS \tag{1.39}$$

and test for approximate equality between the LHS and RHS of (38). One way to proceed is to use (39) as a relative measure. When Jackman and Layard estimate their model they make the implicit assumption that the underlying data generation process is "smooth" enough to use OLS and not e.g. LAD estimation and that its stochastic part is normally distributed. What could upset the "smoothness" and normality of the data generation process in our sample is the introduction of the two labour market policy measures Restart and EAS.

Let there be no initial assumptions about the distributional characteristics of the data generation process determining the overall outflow rate from unemployment in our sample. The percentage differences between the LHS and RHS of (38) can be computed for all models with different sets of regressors. The difference for model 0 (the original Jackman-Layard model) can then be taken as a benchmark: models with smaller differences are at least as satisfactory as model 0 with respect to the "smoothness" of the data generation process and with respect to the normality of its stochastic part. The construction of such a "relative normality test" might be preferable to the usual statistics which test for non-normality, since finite sample critical values of the latter statistics should actually be computed (but this is seldom done) for each sample size by Monte Carlo experiments (cf. Godfrey (1988), p.145). Even if we abstract from such considerations, having established normality of the underlying data generation process "independent" of regression residuals, satisfactory normality test statistics might then be taken as additional evidence that the model is properly specified.

V Results

1. Model specification and selection

Before discussing the empirical evidence about the effectiveness of Restart and EAS we try to find the properly specified model of the determination of the overall outflow rate from unemployment by joining the results of Tables 1.1a, 1.1b, 1.2a and 1.1b. CUSUM plots are added to standard diagnostic tests which are based on normality assumptions of regression residuals and combined with the "distribution-free" selection criteria discussed in the previous section.

When estimating equation (8) we have to take account of the dynamic properties of the data. After some experimentation we arrived at the following specification of the most general model which satisfied the usually used diagnostics testing for fourth and first order serial correlation, functional form, normality and heteroscedasticity:

$$\begin{aligned} \ln[\frac{A}{U}] = \ & const. + seasonals + \delta_1 \ln[\frac{V}{U}] + \delta_2 \ln\hat{c} \\ & + \delta_3 \Delta \ln[\frac{V}{U}] + \delta_4 \ln[\frac{A}{U}]_{-1} + \delta_5 [\frac{t}{100}] \\ & + \delta_6 \frac{EAS}{V} + (1-d)[\delta_7 REST_S + \delta_8 Rest_L] \\ & + d[\delta_9 Rest_T] + \varepsilon \end{aligned} \tag{1.40}$$

where d is a dummy taking value 1 or 0. Because of strong collinearity between the various Restart variables[27] but also for heuristic reasons $Rest_T$ cannot appear in the same regression equation as the other two measures of Restart.

Table 1.1a presents results of OLS regressions on ln (A/U) with a time trend while 1.1b gives results without it. Figure 1.1 shows no discernible time trend over our sample period and the trend variable in Table 1.1a is not significant at conventional levels. However, the t statistics of the coefficients on this variable are often above 1 and it seems, therefore, advisable to investigate further whether a trend variable should be included in the regression or. Inspection of the Cumulative Sum of Recursive Residuals in Figure 1.A1 shows that models without a time trend which include the variable $Rest_S$ perform poorly under the CUSUM criterion. At the 5% significance level the hypothesis that the sum of the recursive residuals sum to zero, i.e. that there is no indication of a structural break in these residuals (cf. Harvey (1990), pp. 153-155) is rejected at the 5% significance level. In all other models, apart from model 5, the CUSUM statistic shows some evidence of a structural break when the trend variable is excluded, although not at a statistically significant level. Leaving out the time trend in some models might lead to possible misspecification which cannot be detected by the given standard diagnostics. All results of our estimation of the determination of the overall outflow rate are given with and without a time trend. When interpreting these results it should be kept in mind, then, that regressions with a trend seem for the most part preferable.

Table 1.2a reports the results of prediction error calculations for models with a time trend, Table 1.2b for models without a time trend. The results in the two tables are quite similar and discussion of model selection with the help of "distribution-free" criteria is therefore confined to the results of Table 1.2a.

First, $\hat{E}_{ccv}$ has been calculated for all 9 models using 39 data points. This allows us to compare directly the performance of all models. Models 1 and 5 are the worst "performers" as the estimate of the mean squared prediction error is increased by 6 and 6.4 per cent respectively relative to Model 0. On the other hand, Models 7 and 9 perform well, their estimates of the mean squared prediction error are 8.6 and 10.1 percentage points lower than that of the original Jackman-Layard model. The calculations of $\hat{E}_{ccv}$ with 40 observations reverses the ranking of the best performing models but give, apart from Model 8, improvements over Model 0 of the same magnitude as do the calculations with 39 observations.

The last column in Table 1.2a allows us to say something about the "smoothness" of the underlying data generation process of the specified models. The statistic $\hat{E}_{ccv}$ is always greater than $N/(N\text{-}k)^2RSS$, as Breiman (1988) has shown. Using the percentage difference between these two performance measures of model 0 as our benchmark, we can unequivocally state that those models which include $Rest_T$ (Models 2 and 9) mirror a data generating process at least as smooth as does Model 0. Those models which include $Rest_S$ (Models 1, 3, 6 and 7) perform especially poorly. For the best performing of these models (Model 7) the percentage difference of $\hat{E}_{ccv}$ and $N/(N-k)^2RSS$ is about 4, for the worst performing (Model 1) approximately 16 percentage points above the benchmark value. We take this as evidence that the inclusion of $Rest_S$ into the regression equation, especially when combined with EAS/V and/or $Rest_L$, leads to irregularities in the data which question normality assumptions about the stochastic part of the underlying data generating process. Models which include EAS/V but exclude $Rest_S$ perform worst as far as $\hat{E}_{ccv}$ is concerned, but, on the other hand, they seem to exhibit enough regularity to warrant normality assumptions.

Before a final judgment on the model with the greatest predictive power can be made we need to look at the diagonal cells of the projection matrices reproduced in Tables A1 and A2 and see whether there are "influential points". The critical value for h_i $(i=1,...,N)$ is approximately equal to $2k/N$ as long as $k/N < 0.4$ (cf. Belsley et al. (1980), ch. 1). In Table A1 h-values generated by models with 40 observations are presented. In all these models most h-values cluster around and none exceed their respective critical value. Furthermore, including one or two Restart variables in the regression causes only marginally higher values in all diagonal cells of the projection matrices relative to the projection matrix of Model 0. We conclude that models with Restart variables do not generate "influential points" in our sample. Models where EAS/V is included use 39 observations for estimation. In all these models, as Table A2 shows, h_{38} exceeds its critical value and we observe a wider dispersion of the h_i's than in the models were EAS/V is not present. The 38-th cell corresponds to the data point 1991q4. We have no ready explanation why at this particular time interval the inclusion of EAS/V seems to generate an "influential point". When interpreting any regression results which include the EAS variable, one should keep in mind, that the predictive power of the estimated regression equation might be quite low.

The two criteria used in Tables 2a and 2b give firm guidance with respect to model selection.[28] With 39 observations, Model 9 minimizes the estimate of the mean squared prediction error while, with 40 observations, it has the second lowest estimate and it has a lower percentage difference of $\hat{E}_{ccv}$ and $N/(N-k)^2RSS$ than Model 0. This last result must imply that the stochastic part of the underlying data generating process of Model 9 is normally distributed if this is the case for the underlying data generating process of the original Jackman-Layard model. While with 40 observations Model 7 minimizes $\hat{E}_{ccv}$, it essentially fails the relative normality test which we have constructed.[29] All other models perform worse under both criteria than Model 9. Finally, the possible existence of "influential points" might lower the predictive power only of those models which include EAS/V.

Summarizing, the determination of the overall outflow rate from unemployment seems best modelled by the regression equation which only adds $Rest_T$ as a regressor to the original Jackman-Layard model. Model 9 has strong predictive power and its underlying data generating process seems "smooth" enough to warrant normality assumptions about its stochastic part. Models which include $Rest_S$, whilst having a lot of predictive power, seem to generate too irregular distributions, while models with EAS/V and $Rest_L$ have no predictive power but seem to generate "smooth" distributions.

Since those models which do not include $Rest_S$ seem to be characterized by a normal error structure, the specification in equation (1.40) can be completed by adding the condition that as long as $\delta_7=0$, $\varepsilon \sim N(0,\sigma^2)$. An important implication of our results relates to the reliability of the usual test statistics associated with OLS and SUR estimation. When analyzing the empirical evidence, one needs to keep in mind that these statistics can only be relied on as far as models are concerned where $Rest_S$ is not a regressor.

2. Results of OLS and SUR estimation

We now revisit Tables 1.1a and 1.1b to analyze the impact of Restart and EAS on the overall outflow rate from unemployment. Whether a time trend is included or not, $Rest_S$ and $Rest_L$ are the two labour market measures which are well determined independent of the specification. The variable $Rest_L$ is only significant in the model without a time trend and when it is the sole labour market policy variable (Model 8 in Table 1.1b). Finally, the coefficient on EAS/V has the wrong sign four out of five times and is always insignificant at conventional levels. When it has the right sign it has a t statistic of approximately 0.1. The EAS/V measure is just too small to have a statistically significant impact on the rather well defined overall outflow rate from unemployment.

For reasons discussed in length in the previous section we have strong doubts about the normality of the underlying process when $Rest_S$ is included as a regressor. Results of models containing this variable should therefore be treated with caution. Exclusion of a time trend might also lead to misspecification in all models apart from Model 5. When comparing Tables 1.1a and 1.1b we seem to be confronted with a problem of omitted variables, as the coefficients on the Restart variables are consistently lower in models without a time trend. The negative sign of the trend in all models where it has predictive power leads us to conclude that exclusion of the trend might generate a downward bias of the coefficients on the Restart variables. In conjunction with the CUSUM plots, we consider this as sufficient evidence for the need to specify a model with a time trend. Combining the results from data exploration and estimation, the model which outperforms all others is clearly Model 9, which gives the following long-run relationship,

$$\ln\frac{A}{U} = 0.233\ln\frac{V}{U} + 0.557\ln\hat{c} + 0.268Rest_T - 0.313\frac{t}{100} \qquad (1.41)$$

The coefficient on ln (V/U) is of the same magnitude as those estimated by Pissarides (1986) and Layard et al. (1991), while the coefficient on ln ĉ is very similar to the the latters' estimate. We should also note, though, that the coefficient on $Rest_T$ is not an elasticity and can, therefore, not be interpreted in a simple minded fashion. However, in steady state simulations of the impact of Restart on the overall outflow rate from unemployment this coefficient does have a sensible interpretation.[30]

The SUR equations have a similar dynamic specification as (1.40). However, because of the collinearity between the various labour market policy measures, they are estimated for each measure separately. To ensure that no statistically significant serial correlation occurs, the differenced form of the respective labour market policy variable is sometimes added to its level. The coefficients on ln (V/U) have in all regressions similar magnitudes to those obtained by Jackman and Layard (1991) in their SUR estimates. Also there is only weak evidence of heterogeneity in these regressions, as the coefficients on ln s_d (d=1,...,5) have often a negative sign or are poorly defined. Again, this is in line with the findings of Jackman and Layard.

Table 3 shows a very dramatic effect of $Rest_S$ on duration-specific outflow rates. We find a strong substitution effect for the first duration category of unemployment, while this measure of Restart seems to have a well defined positive impact on the outflow rates of all other duration categories of unemployment. Since $Rest_S$, like all other labour market variables, does not appear in lagged form, it is hard to justify its impact on those who already have been continuously unemployed for more than 4 quarters. It becomes even more difficult to motivate its large and very well defined impact on the 1-2 duration category, which, at best, it can only marginally influence (cf. footnote 16). We take these results as further evidence that $Rest_S$ is not a good measure for capturing the effect of Restart on the average search effectiveness of the unemployed throughout the expansionary phase of the business cycle. Instead, it seems to either proxy for other labour market policies over the period affecting, apart from the shortest, all duration categories of unemployment evenly. Or it essentially functions like a dummy variable reflecting the possible initial impact of the introduction of Restart linked, as was already mentioned to a once and for all "shake out" of dubious benefit claimants in 1986/87. Such a "shake out" might lower the outflow rate of the short-term unemployed[31], and could have a positive impact on the outflow rates of all other duration categories. At any rate, we believe that these results constitute a further reason why regressions with $Rest_S$ are either not very informative or misleading.

In the regressions with $Rest_L$ we see a well defined substitution effect for the very short-term unemployed, as the coefficient on this measure is negative and statistically significant for the 0-1 duration category. However, this measure of Restart has no predictive power as far as the determination of all other duration-specific outflow rates is concerned (cf. Table 1.4).

The variable $Rest_T$, on the other hand, has more predictive power as Table 1.5 shows. The substitution effect, again impacting on the shortest duration category, is highly significant, while for the 3-4 and 4+ duration categories the coefficients on $Rest_T$ are positive and statistically significant with probability values 0.056 and 0.070 respectively. There seems to exist a positive impact on the 2-3 category (the category where on a priori grounds one might have expected the strongest impact), but it is with a probability value of 0.190 not significant at conventional levels. Nevertheless, the inclusion of $Rest_T$ as a regressor gives results which are in line with theoretical considerations. A substitution effect for the shortest duration category seems plausible, while the Restart programme is meant to boost the outflow rates of all those who have unemployment spells longer than six months.

The measure of the Enterprise Allowance Scheme, which had no predictive power for the overall outflow rate, has a well defined influence on the determination of two duration-specific outflow rates (cf. Table 1.6). For the 2-3 and 4+ duration categories, the coefficients on EAS/V are positive and statistically significant with probability values 0.054 and 0.064 respectively. At first glance this result seems to run somewhat against our priors. Since a person becomes eligible for the enterprise allowance scheme after 8 weeks of a continuous unemployment spell and since we believe that lower outflow rates in longer duration categories are partially caused by heterogeneity we would expect the shorter duration categories to benefit more. This is because we believe that the "better" unemployed, i.e. those who have a competitive advantage in the labour market, are also the people most likely to fulfil the financial requirement of the scheme. These results could, on the other hand, be interpreted as implying dead weight loss. Assume that the take up of the scheme in each eligible duration category is proportionate to the relative size of the category. If e.g. we find an insignificant impact of EAS/V on the outflow rate of the 1-2 duration category, while the impact is significant with the 2-3 duration category, then dead weight loss is probable. In the shorter duration category, where, as long as some heterogeneity exists, the average "quality" of the unemployed is better, people take up the scheme who would have tried to find self-employment even in its absence. Unfortunately, we have no information about the duration structure of EAS participants, but it is hard to come up with reasons why the duration categories 2-3 and 4+ should be over-represented among those who take up the scheme. In conclusion, Table 1.6 points to some dead weight losses of the enterprise allowance scheme supporting the evidence for such losses cited by Stern (1988).

Table 1.7 gives the long-run relationships implied by the estimated SUR equations for those duration-specific outflow rates which are determined by $Rest_T$ and EAS/V, for the most part in a statistically significant way. We, also include the equation for $(A/U)_3$ and $Rest_T$ since the coefficient on $Rest_T$ is relatively well defined and since this equation might prove useful in the simulations below. The steady state simulations of the following section are based on these relationships and on equation (1.41).

3. Steady state simulations of the effectiveness of Restart and EAS

The following steady state simulations are back-of-the-envelope calculations meant to give a rough estimate of the effect which the introduction of Restart and of additional EAS-slots had on the total stock of unemployment during the expansionary phase of the business cycle in Britain. These calculations entail a comparison of stocks and flows of the quarters 1984(2) and 1990(2) which we designate as steady state quarters[32].

Recall that in the steady state

$$U = \frac{I}{[\frac{A}{U}]}$$

Taking logs and differences we get

$$\Delta \ln U = \Delta \ln I - \Delta \ln[\frac{A}{U}] \tag{1.42}$$

For small Δ the growth rate of the stock of unemployment can be decomposed into the difference of the growth rate of inflows into unemployment and the growth rate of the outflow rate from unemployment. For large values of Δ these "growth rates" are approximations of percentage changes with the base being the mean of the values of the two end points. Keeping this in mind, we can calculate the relative contribution of the overall outflow rate to the changing stock of unemployment between the two steady state quarters. Let 1984(2)=1 and 1990(2)=2, then

$$U_1 = \frac{I_1}{[\frac{A}{U}]_1} = \frac{628900}{0.3288} = 1912530;$$

$$U_2 = \frac{I_2}{[\frac{A}{U}]_2} = \frac{534000}{0.4808} = 1110649.$$

Let the difference taken between the two steady states be denoted by $\Delta_{2\text{-}1}$ and substitute this operator for Δ in (1.42), i.e.

$$\Delta_{2\text{-}1}\ln U = \Delta_{2\text{-}1}\ln I - \Delta_{2\text{-}1}\ln[\frac{A}{U}] \tag{1.42'}$$

Plugging the two sets of values for U[33], I and (A/U) into (1.42') we get

$$- 0.54 = - 0.16 - 0.38 .$$

So, roughly 70% of the (negative) growth rate of unemployment between the two steady state quarters can be attributed to the rise in the outflow rate.

Applying $\Delta_{2\text{-}1}$ to equation (1.41) we get

$$\begin{aligned}\Delta_{2\text{-}1}\ln\frac{A}{U} = 0.233\Delta_{2\text{-}1}\ln\frac{V}{U} + 0.557\Delta_{2\text{-}1}\ln\hat{c} \\ + 0.268\Delta_{2\text{-}1}Rest_T - 0.313\Delta_{2\text{-}1}\frac{t}{100}\end{aligned} \tag{1.43}$$

The terms $0.268\Delta_{2\text{-}1}Rest_T$ and $-0.313(\Delta_{2\text{-}1}t/100)$ give the contributions to the growth rate of (A/U) in absolute terms. But, these contributions depend crucially on the magnitudes of $\Delta_{2\text{-}1}Rest_T$ and $(\Delta_{2\text{-}1}t/100)$. Since we are primarily interested in the effect of Restart, we focus on the expression $0.268\Delta_{2\text{-}1}Rest_T$. Clearly, if $\Delta_{2\text{-}1}Rest_T=1$, i.e. if after the introduction of Restart (note that in 1984(2) $Rest_T=0$) all those who are eligible for an interview are participants in 1990(2), then the existence of Restart contributes 26.8 percentage points to the growth rate of (A/U). In fact, the proportion of eligible participants was in the second steady state quarter only 0.6677. From equation (1.43) it follows that our measure of Restart contributes 17.89 percentage points to the total 38 percentage points by which (A/U) grows between the two steady states. This result can also be written as

$$\begin{aligned} \ln[\frac{A}{U}]_2 - \ln[\frac{A}{U}]_1 &= \textit{other effects} + \textit{Restart effect} \\ &= 0.2011 + 0.1789 = 0.38 \end{aligned} \tag{1.44}$$

From this we can calculate the overall outflow rate in the second steady state quarter if Restart had not been introduced:

$$\ln[\frac{A}{U}]_2 = 0.2011 + \ln[\frac{A}{U}]_1 \ .$$

Solving this last equation we get an outflow rate of 0.40207 instead of 0.4808 when the impact of Restart is taken into account. Between 1984(2) and 1990(2), our simulation computes a fall in the total stock of unemployment of about 802,000[34] with the higher Restart impacted outflow rate. On the other hand, the lower outflow rate 0.40207 implies a fall of the total stock of unemployment between the two steady state quarters of only 584,403. It thus can be concluded that approximately 27 per cent of the fall of the total stock of unemployment between 1984(2) and 1990(2) seems to be attributable to the introduction of the Restart programme.

From our SUR estimates we can calculate the contribution of the introduction of $Rest_T$ and of $\Delta_{2\text{-}1}EAS/V$ to $\Delta_{2\text{-}1}\ln(A/U)_d$, d=1,..,5. Column two of Table 1.8 shows these contributions for four duration-specific outflow rates. Column three gives the actual outflow rates for the second steady state quarter, column four outflow rates imputed under the assumption that the respective ALMP has not been introduced. We can write equation (44) as two sets of equations for duration-specific outflow rates:

$$\ln[\frac{A}{U}]_{d,2} - \ln[\frac{A}{U}]_{d,1} = \textit{other effects} + \textit{Restart effect}, \qquad (1.45)$$

$$\ln[\frac{A}{U}]_{d,2} - \ln[\frac{A}{U}]_{d,1} = \textit{other effects} + \textit{EAS effect}, \qquad (1.45')$$

where d=1,..,5. We should note that in (1.45) the EAS effect, in (1.45') the Restart effect is subsumed under other effects. These equation sets are then used to impute outflow rates in the presumed absence of the respective ALMP measure.

In the steady state, the stock of long-term unemployment is determined by the inflow into long-term unemployment and the outflow rate from it (cf. equation (1.20)). If we combine equation (1.22) which gives an estimate of the inflow into long-term unemployment[35] with the information contained in Table 1.8, we can use equation (1.20) to simulate the effect of Restart and EAS on the stock of long-term unemployment between the two steady states.

Let $U_{L,1}$ be the actual stock of long-term unemployment in the first steady state quarter, 1984(2), and $U_{1,2}$ be the actual stock of unemployment of the 0-1 duration category in the second steady state quarter, 1990(2).[36] Also, let $(A/U)_{d,2}=P_{d,2}$, d=1,..,5, be the duration-specific outflow rates in the second steady state quarter. A simple recursive formula can then be used to estimate the inflow into long-term unemployment:

$$\begin{aligned} \hat{U}_{4,2} &= U_{1,2}(1-P_{1,2})(1-P_{2,2})(1-P_{3,2}) \\ \hat{U}_{5,2} &= \hat{U}_{4,2}(1-P_{4,2}) \\ \hat{I}_{L,2} &= \frac{1}{2}(\hat{U}_{4,2}+\hat{U}_{5,2}) \end{aligned} \tag{1.46}$$

where $\hat{U}_{4,2}$, $\hat{U}_{5,2}$ and $\hat{I}_{L,2}$ are, for the second steady state quarter, estimates of the stock of duration categories 3-4 and 4+ and of inflows into long-term unemployment respectively. Finally,

$$\hat{U}_{L,2} = \frac{\hat{I}_{L,2}}{p_{5,2}}, \tag{1.47}$$

and the estimated change in the stock of long-term unemployment between the two steady states equals $\hat{U}_{L,2} - U_{L,1}$.

In Table 1.9 the results of four different scenarios are presented. When Restart is assumed to have been introduced and the ratio of EAS/V is assumed to have risen by 52% (scenario I), the estimated stock of long-term unemployment in the second steady state quarter becomes 376,954 and the estimated fall in the stock of long-term unemployment between the two steady state quarters 466,376[37].

Under scenario II we assume that Restart is not present, but that, when present, $Rest_T$ has an impact on $(A/U)_3$. This last assumption implies that $p_{3,2}$ falls from 0.3496 to 0.2998, while the statistically significant positive effects of $Rest_T$ on the outflow rates of the last two duration categories also imply a fall of $p_{4,2}$ from 0.2765 to 0.2279 and of $p_{5,2}$ from 0.1789 to 0.1196. Under scenario II, the strong substitution effect acting on duration category 0-1 results in a rise of $p_{1,2}$ from 0.4574 to 0.5329. Our calculations show that this substitution effect leads to a net increase of the inflow into long-term unemployment when Restart is present ($\hat{I}_{L,2}$ equals 67,438 under scenario I, but only 64,270 under II). However, the large impact of $Rest_T$ on $p_{5,2}$ implies an overall beneficial effect of Restart which is very substantial, as under II $\hat{U}_{L,2}$ falls only to 537,374 and $\hat{U}_{L,2}$-$U_{L,1}$ reaches only -305,956. As long as $Rest_T$ impacts upon $(A/U)_3$, 35 per cent of the fall in the stock of long-term unemployment between the two steady states can be attributed to the introduction of Restart.

Scenario III is a slight modification of II: now, we assume that $Rest_T$ does not affect $(A/U)_3$, i.e. in the absence of Restart $p_{3,2}$ remains 0.3496. Under III $\hat{U}_{L,2}$ falls to 499,139, $\hat{U}_{L,2}$-$U_{L,1}$ becomes -344,191 and the introduction of Restart thus explains 26 per cent of the fall in long-term unemployment.

Finally, the additional impact of a 52 per cent increase in the ratio of EAS-slots to vacancies is investigated under scenario IV. As we assume Restart to be present, this additional impact is simulated by lowering $p_{3,2}$ from 0.3496 to 0.3333 and $p_{5,2}$ from 0.1789 to 0.1665. The increase in EAS/V makes a discernible, albeit small difference in the fall of the stock of long-term unemployment between the two steady states. Under IV $\hat{U}_{L,2}$-$U_{L,1}$ becomes -428,129 which implies that 8 per cent of the fall in long-term unemployment is attributable to Δ_{2-1}EAS/V.

Our simulations therefore seem to indicate that the two ALMP measures act upon the stocks of both short-term and long-term unemployment.

The measure EAS/V has a positive net impact on outflows from both stocks. To the estimated 38,247 decrease in the number of long-term unemployed due to Δ_{2-1}EAS/V we need to add individuals who leave short-term unemployment because of EAS. Since EAS is, however, not significant in the determination of the overall outflow rate, we cannot quantify this decrease in short-term unemployment with this simulation approach.

This reduction of short-term unemployment leads, ceteris paribus, to smaller inflows into long-term unemployment and thus to a lower stock of long-term unemployment. Simple calculations show that without this indirect effect the stock of long-term unemployment would have only been reduced by 28,039 instead of 38,247.

The introduction of Restart, according to our calculations, has an adverse net impact on the outflows from short-term unemployment despite the fact that this measure is also targeted at shorter duration categories. A strong substitution effect acting upon the shortest duration category, and more than compensating for the increased outflows from the duration categories 2-3 and 3-4, causes an increased net inflow into long-term unemployment of 3,168 persons (when $Rest_T$ affects $(A/U)_3$) or of 7,741 persons (when $Rest_T$ does not affect $(A/U)_3$). The nature of the Restart programme seems to make a substitution effect highly likely. No matter which measure of Restart is used, in all SUR equations of the duration category 0-1 a well defined negative coefficient of similar magnitude can be found on the respective Restart variable. We, therefore, find our results, which hint at a strong substitution effect, very plausible. However, despite a strong substitution effect, the Restart programme is very succesful in reducing total unemployment. The number of persons <u>not</u> flowing out of very short-term unemployment because of Restart can only be a fraction of those who flow out of higher duration categories and long-term unemployment as a direct result of the introduction of the programme. The highly significant positive coefficient on $Rest_T$ in the estimated equation of the determination of the overall outflow rate from unemployment can be taken as proof for this assertion. The idea put forward by e.g. Layard et al. (1991) that increasing the search effectiveness of the long-term unemployed will lower wage pressure and thus create additional employment seems to be borne out by our evaluation of the Restart programme.

Finally, the results of our simulations for Restart, based on the estimation of the determination of the overall and duration-specific outflow rates are only roughly comparable. The unobservable outflow rate p_I enters the overall outflow rate, thus the overall outflow rate is not just a linear combination of the observable duration-specific outflow rates. The simulations are, nevertheless, roughly comparable because $Rest_T$ should not affect p_I by much. As Restart increases inflows into long-term unemployment according to our simulations, the reduction in total unemployment must be entirely driven by net outflows from long-term unemployment. We can, therefore, use the results from the overall outflow rate as a guide to the most likely scenario of our duration-specific simulations of the effectiveness of Restart. On the basis of the results of the overall outflow rate simulations, scenario II seems most probable as the difference in the reduction in total unemployment due to Restart is much smaller than under scenario III (approximately 218,000 - 158,000 under II vs. 218,000 -115,000 under III). One could also presume that the substitution effect is not picked up in the estimation of the overall outflow rate and that for that reason the reduction of total unemployment is greater in the overall outflow rate simulation. However, in duration-specific outflow rate simulations of scenario II with $p_{1,2}$ remaining at 0.4574, i.e. assuming no substitution effect, total unemployment falls by 254,512 due to Restart. So, the estimation of the determination of the overall outflow rate does pick up a substitution effect, and the existence of such an effect seems certain. In summary, scenario II seems most likely, i.e. Restart retards outflows from the duration category 0-1, but boosts the outflow rates of the three longest duration categories. Thus, in our simulations 35 per cent of the reduction in long-term unemployment between 1984 and 1990 can be attributed to the introduction of Restart.

VI Conclusions

Applying transition methodology the role of Restart in the cure of the partial hysteresis of unemployment has been analyzed in this chapter. This methodology, looking at the determination of overall and duration-specific outflow rates from unemployment, is especially useful in the case of Restart since this programme does not create direct vacancies but is conceived to enhance the ability of the unemployed to flow from the register during an expansionary phase of the business cycle.

After a thorough exploration of the data we are certain that the appropriate measure for Restart is $Rest_T$, i.e. the ratio of the quarterly flow of all Restart interviews to the duration stocks of unemployment U_3 and U_L. This measure seems to be a "smooth" enough covariate to ensure that the underlying data generation process is regular and warrants normality assumptions. We are also certain, that our estimates are not the results of some statistical artifacts, but that they reflect some stable economic relationship for the sample analyzed.

In the OLS regression on the overall outflow rate from unemployment the coefficient on $Rest_T$ is positive and highly significant. Thus Restart is an important determinant of the overall outflow rate and hence contributes to the cure of partial hysteresis. The estimates of duration-specific outflow rates with our Restart measure as a regressor show, however, that Restart results in a strong substitution effect acting upon the very short-term unemployment (those with continuous spells between 0 and 3 months) which, despite positive impacts on duration categories 2-3 and 3-4, causes increased net inflows into long-term unemployment. So, the reduction in total unemployment due to Restart comes entirely about via reductions in the stock of long-term unemployment. Steady state simulations imply that approximately 35 percent of the fall in long-term unemployment between 1984 and 1990 can be attributed to the introduction of Restart.

The impact of the Enterprise Allowance Scheme on the stock of unemployment has also been investigated. The variable EAS/V has no predictive power in the overall outflow rate equation, but seems to have a well defined positive influence on the outflow rates of the duration categories 2-3 and 4+. However, there is some evidence of dead weight loss as the outflow rates of unemployed persons with shorter spells (e.g. category 1-2) are not influenced by EAS/V in a statistically significant way. Steady state simulations show that due to the Enterprise Allowance Scheme net inflows into long-term unemployment are lowered and that approximately 8 per cent of the fall in long-term unemployment can be explained by a rise in the EAS/V ratio between 1984 and 1990. The results involving EAS should, however, be taken with caution, as the possible existence of "influential points" in equations with EAS/V as a regressor hint at low out of sample predictive power.

While the Enterprise Allowance Scheme is only a small programme with marginal impact, the Restart programme has been a major tool in the fight against long-term unemployment in Britain and has, according to our results, in the second half of the eighties contributed to the cure of partial hysteresis in a substantial way. A vigorous and extended application of this programme seems, therefore, to be desirable during the next recovery phase. The question should also be pursued as to whether mechanisms can be devised which eliminate or reduce the observed strong substitution effect among the very short-term unemployed.

Further investigations into the effectiveness of the Restart programme should, for the time being, concentrate on the question of how it influences the behaviour of the long-term unemployed during the contractionary phase of the business cycle, whether it e.g. increases labour force attachment during a slump. For such investigations aggregate time series analysis is, however, not an appropriate tool. Microeconometric studies analysing labour market transitions during the period 1991-1992 seem to lend themselves better to the task of establishing the determinants of labour force attachment or withdrawal.

Footnotes

1. Previous British evaluation studies using time series and employing "transition methodology", i.e. outflow rate analysis, are Pissarides and Haskel (1987), Haskel and Jackman (1988), Lehmann (1990) and Disney et al. (1992).

2. Gregg (1989), Dicks and Hatch (1989) and Disney et al. (1992), ch.7.

3. For our Restart variable we have data points from 1986(3) to 1992(2).

4. The other two studies evaluating EAS using "transition methodology" (Disney et al. (1992), ch.7 and Lehmann (1990)) have far less data points for EAS than this study.

5. From July 1986 to March 1987 only persons who had been unemployed for more than a year were asked to attend a Restart interview, since April 1987 the scheme was extended to all with durations of more than 6 months.

6. For a full description of this process see White and Lakey (1992).

7. According to White and Lakey approximately 18% of the cohort under study failed to attend the interview outright or were excused from it. Most of these people had found jobs or left the labour force between the mailing of the letter and the assigned date of interview. Another 18% of the sample were persons who unexcused failed to attend the interview at the assigned date, but who eventually did so after a follow-up letter. While the authors give no information on the average unemployment spell of this sub-group of first Restart interview participants, our interpretation is that most of this group will also fall into the 6-9 months duration category.

8. Unpublished annual data on the break-down of Restart interviews by duration were made available by the Employment Service in Sheffield. The 6-9 months duration interviews as a percentage of the total were as follows:

April 1987 - March 1988	41
April 1988 - March 1989	35
April 1989 - March 1990	37
April 1990 - March 1991	40
April 1991 - March 1992	41

For April - July 1992 we also assume 41%.

9. $\hat{c}$ depends crucially on the duration structure of unemployment and thus varies over time.

10. Our statement that most males, if they flow from unemployment, have as their destination the state of employment is the conventional view on this issue which has been recently criticized by Schmitt and Wadsworth (1993). According to their evidence, an increasing fraction of male outflows from unemployment consists, especially in the late eighties, of transitions to the state of economic inactivity.

11. The enterprise allowance scheme might generate competition between participants in the scheme and other businesses, and hence increase inflows into unemployment via displacement of output effects. Stern (1988) cites evidence that inflows into EAS cause a 50% displacement of output effect. Even assuming this high percentage, EAS does, nevertheless, not cause substantial inflows into unemployment. For, if we assume that all the displaced entrepreneurs are male and all flow into unemployment, the maximum percentage of inflows caused by EAS can, for our sample, amount to only 2.7 per cent (the mean would be 1.4 per cent) of all inflows into male unemployment. So, any indirect feedback effect on the overall outflow rate arising from EAS displacing small businesses must be negligible.

12. An exhaustive list of all such programmes can be found in Disney et al. (1992), ch.6.

13. For a discussion of the many successive employment measures in Britain most of which were too short-lived to be analyzed with aggregate time series, cf. Gregg (1990).

14. For an extended and lucid discussion of how heterogeneity and state dependence can contribute to lower outflow rates of the unemployed with longer spells, s. Pissarides and Haskel (1987).

15. The definition of p_I given in (13) is "based on the assumption that the outflow rate over the first 3 months is constant, so that by the end of a quarter the remaining stock excludes one-half of those who leave within the first three months of their unemployment" (s. Layard et al. (1991), p. 227). The weight given to p_I consistent with its definition is $1/2(I_t/U_t)$ as only one-half of I_t contributes to the measured overall outflow rate. We should also note that the weights do not add to one since

$$\sum_{i=1}^{5} \theta_i = 1 + \theta_I > 1.$$

16. The scenario under which both shortest duration categories are impacted positively by a Restart variable can be taken as a strong test of whether this variable proxies for the initial impact of Restart or other labour market policies not directly linked with the Restart process. If the Restart variable carries the information it is meant to carry, there can be no circumstances under which the first duration category is significantly positively affected by this variable. On the other hand, the second duration category might have a <u>weak</u> positive correlation with the proper Restart measure, as a small proportion of this duration category, before reaching the threshold of a six months spell, might receive a Restart letter and immediately leave the register. However, a very strong positive correlation with a Restart variable would lead to doubts about the appropriateness of the Restart measure used. In summary, if the coefficients on the Restart variable are highly significant for both p_1 and p_2, this has to be taken as <u>strong</u> evidence, if the coefficient on this variable is highly significant and positive only for p_2, as <u>weak</u> evidence that the chosen Restart measure proxies for something not directly linked to the Restart process.

17. Formal tests of whether the variables are I(0) or I(1) are not sensible given the few data points under consideration.

18. We should note that if we employ formula (1.13) for P_I, then for nearly all data points $P_I >> P_1$.

19. Note that in the steady state A/U and $\hat{c}$ must be equal by construction. It should also be pointed out that the formula for $\hat{c}$ uses a much more elaborate duration structure than the one employed in equations (1.17) and (1.18). So, even though the first weight in the formula, I/2U, has a flow element, its contribution to $\hat{c}$ is minor and should not generate a simultaneity bias.

20. A description of the construction of s_d can be found in the data appendix.

21. A discussion of their derivation from the available data sources can be found in the data appendix.

22. "Normalizing" the number of Restart interviews by the stock of eligible participants creates exogenous variables. Endogeneity problems are only caused by the fact that the Restart programme has a built-in mechanism which <u>automatically</u> triggers an increase in the number of Restart interviews as longer duration categories of unemployed enlarge their shares. There is no evidence for other sources of endogeneity, like e.g. a more forceful application of the programme by the government in reaction to higher levels of long-term unemployment.

20. We regress one of the ALMP variables which are suspected of collinearity on all non-ALMP variables. Then an ALMP variable is added to the regressors. Very high t-statistics of the coefficient on the RHS ALMP variable and a drammatic rise of R^2 as we add this ALMP variable give some indication of collinearity between the two ALMP measures. For a discussion of this procedure, cf. Judge et al. (1985), ch.23.

<u>Auxiliary Regressions</u>

Dependent variables: 1. EAS/V; 2. $Rest_T$; 3. $Rest_L$.

RHS ALMP variable	R^2	t-statistic
1.		
none	0.325	---
$Rest_T$	0.660	5.609
$Rest_S$	0.643	5.345
$Rest_L$	0.612	4.864
2.		
none	0.697	---
$Rest_S$	0.888	7.513
$Rest_L$	0.994	42.339

3.

none	0.660	---
$Rest_S$	0.832	5.791

24. $Rest_S$ behaves very much like a dummy variable, hovering around one. We would, therefore, expect that especially this measure of Restart carries information about the initial impact of the programme.

25. In the presence of important "outliers" the Least Absolute Deviation estimator (LAD estimator) can often be a better predictor than the OLS estimator. We would like to avoid LAD estimation, however, since there is no closed form solution available and the distribution theory underlying it is much less well established than the theory underlying OLS estimation.

26. It can be found in Breiman (1988).

27. See the results of the auxiliary regressions in footnote 23.

28. We should note, parenthetically, that the results and diagnostics in Tables 1a and 1b not only give us no firm guidance but could be quite misleading as far as model selection is concerned. If we e.g. jointly take the standard error of the regression and the adjusted R^2 statistic as selection criteria, Model 1 performs best in Table 1a, while by far worst when applying the two criteria tabled in 2a!

29. Model 7 performs much better under the second criterion if we exclude the trend variable (cf. Table A2). However, the above reported CUSUM tests showed that dropping the trend variable from regressions which included $Rest_S$ is not permissible.

30. We should also note that because the coefficient on $Rest_T$ is not an elasticity a test for CRS in f cannot be undertaken.

31. One can with some justification assume that the shortest duration category is not directly affected by the introduction of tighter benefit eligibility criteria. The very short-term unemployed are clearly not the target of a policy of reducing fraud among benefit claimants. However, a small indirect and negative effect of such a policy for this group might exist insofar as persons from longer duration categories might now be more willing to flow back into employment and might thus compete with some of the very short-term unemployed over jobs. In addition persons from longer duration categories may, after an interval, re-register as unemployed and remain unemployed for a sufficiently long period to lower the outflow rate of the very short-term unemployed.

32. We do not take 1985(2), when abs(ΔU) is minimized, as the initial steady state quarter even though it was used for the calculation of $\hat{c}$. For 1984(2) abs(ΔU) is also very small and by using this quarter the period which is of interest to us can be covered.

33. The two stocks of unemployment are imputed from the values which we have for inflows and the outflow rate, thus ensuring that (42) will always hold. The actual values of U for the two quarters are quite similar.

34. The actual fall was 2,015,400 - 1,123,700 = 891,700.

35. Figure 5 plots a moving average of estimated inflows (based on the Haskel-Jackman formula) into long-term unemployment for our sample period.

36. Note that for consistency the same steady state quarters are used as when the effect of $Rest_T$ on the overall outflow rate was simulated. However, the data also support this choice as $abs(\Delta U_L)$ is very small for both quarters.

37. We should note that the actual stock of long-term unemployment in the second steady state quarter ($U_{L,2}$) and the actual fall in long-term unemployment between the two steady states ($U_{L,2}$-$U_{L,1}$) are 383,280 and -460,050 respectively. Since our simulation values are very close to these actual values, the undertaken simulations have a high degree of realism.

Appendix

Data Appendix

The total stock of unemployment, U_t, is represented by the X-11 series of male unemployment (excluding school leavers) in Great Britain, provided by the Department of Employment. It is consistent with the 1988 definition of unemployment.

We used the following duration-specific stocks of male unemployment:

1979(3)-1983(2):

$U_{1,t}, U_{2,t}, U_{3,t}, U_{4,t}, U_{5,t}, U_{6,t}, U_{8,t}, U_{12,t}, U_{12+,t}$

($U_{1,t}$ e.g., means that the person counted at t was between 0 and 1 quarters continuously unemployed, $U_{8,t}$, between 6 and 8 and $U_{12,t}$, between 8 and 12 quarters, while $U_{12+,t}$ denotes an continuous unemployment spell of more than 12 quarters);

1983(3)-1992(3):

$U_{1,t}, U_{2,t}, U_{3,t}, U_{4,t}, U_{5,t}, U_{6,t}, U_{8,t}, U_{12,t}, U_{16,t}, U_{20,t}, U_{20+,t}$.

They were computed as beginning-of-the-quarter-stocks from data published in the January, April, July and October issues of the Employment Gazette and adjusted, where necessary, to ensure consistency with the total stock of male unemployment.

To get a series of actual vacancies, V_t (vacancies are only available for males and females, this does not cause any problems, however, since total vacancies better reflect the true state of the labour market, as does male unemployment), we adjust the published series of vacancies, which are notified vacancies at employment exchanges, by the procedure outlined in Jackman et al. (1989).

A detailed description of the construction of the average search effectiveness index, $\hat{c}_t$, can be found in the appendix of Jackman and Layard (1991).

The construction of the "survival probabilities" to duration category d (d=1,..,5) are as follows:

$s_{1,t}=U_{1,t}/I_{t-1}$; $s_{2,t}=U_{2,t}/U_{t-1}$; $s_{3,t}=U_{3,t}/U_{t-2}$;

$s_{4,t}=U_{4,t}/U_{t-3}$; $s_{5,t}=U_{L,t}/(U_{t-4}+U_{t-5}+...+U_{t-11})$.

The Restart and EAS measures were calculated on the basis of published data in the Employment Gazette (April and October issues) and of unpublished figures, made available by the Department of Employment.

Total EAS flows for males and females which were used in the analysis are only available on an annual basis. From the secular trend throughout the period we imputed quarterly flows rather than assume an equal share of the annual flows per quarter.

The quarterly joint number of Restart interviews for males and females can be calculated from the cumulative totals for a reported year which goes from April to March of the following year. A breakdown of these interviews by the duration structure of eligible unemployed is, however, only provided on an annual basis and given in footnote 8. We assumed that this breakdown did not change for 4 quarters of a reported year and thus arrived at a partition of the number of Restart interviews for male and female unemployed with a spell between 6 and 9 months and for male and female unemployed with a spell longer than 12 months. The descriptive literature about the Restart programme substantiates this partition as the relevant one in terms of duration structure. Finally, the proportion of male unemployent in the relevant duration-specific stocks were used to compute the number of Restart interviews for males by duration.

GAUSS routine for calculation of $\hat{E}_{ccv}$

****

```
e2=0;
n=rows(x);
i=1;
do until i > n;
e1=0;
y1=x[1,.];
x=trimr(x,1,0);
z1=x[.,6];
z2=x[.,4 5 7 8 9 10 11 12 13];
v1=y1[.,6];
v2=y1[.,4 5 7 8 9 10 11 12 13];
b=inv(z2'z2)*z2'z1;
p1=v2*b;
e1=(p1-v1)^2;
e2=e2+e1;
x=x|y1;
i=i+1;
endo;
pe=e2/n;
```

****

Table 1.1a
OLS regression on ln(A/U);sample period 82q3 to 92q2(92q1[£])

Model	$\ln(V/U)$	$\ln\hat{c}$	$\Delta\ln(V/U)$	$\ln(A/U)_{-1}$	t/100	$Rest_S$	$Rest_L$	$Rest_T$	Eas/V	const
0	0.146**	0.371**	0.191**	0.486**	0.123	--	--	--	--	-0.229**
	(0.041)	(0.161)	(0.087)	(0.153)	(0.074)[£]					(0.099)
1	0.163**	0.342*	0.094	0.204	-0.252	0.095**	0.127	--	-1.064	-0.462**
	(0.039)	(0.171)	(0.088)	(0.166)	(0.167)	(0.037)	(0.078)		(0.926)	(0.134)
2	0.156**	0.316*	0.126	0.367**	-0.214	--	--	0.175**	-0.433	-0.349**
	(0.042)	(0.183)	(0.092)	(0.157)	(0.175)			(0.082)	(0.928)	(0.131)
3	0.164**	0.390**	0.106	0.233	-0.052	0.100**	--	--	-0.924	-0.402**
	(0.041)	(0.173)	(0.090)	(0.170)	(0.116)	(0.038)			(0.949)	(0.132)
4	0.161**	0.342*	0.139	0.416**	-0.153	--	0.142	--	-0.111	-0.279**
	(0.043)	(0.187)	(0.094)	(0.157)	(0.178)		(0.085)		(0.927)	(0.124)
5	0.163**	0.396**	0.155	0.460**	0.075	--	--	--	0.095	-0.201*
	(0.045)	(0.189)	(0.097)	(0.160)	(0.116)				(0.946)	(0.118)
6	0.157**	0.426**	0.149*	0.224	-0.256	0.083**	0.112	--	--	-0.391**
	(0.037)	(0.151)	(0.079)	(0.166)	(0.160)	(0.034)	(0.078)			(0.105)
7	0.159**	0.459**	0.152*	0.248	-0.077	0.088**	--	--	--	-0.344**
	(0.038)	(0.152)	(0.081)	(0.168)	(0.103)	(0.034)				(0.101)

Table 1.1a
OLS regression on ln(A/U) (continued)

Model	ln(V/U)	lnê	Δln(V/U)	ln(A/U)$_{-1}$	t/100	Rest$_S$	Rest$_L$	Rest$_T$	Eas/V	const
8	0.144**	0.338**	0.184**	0.441**	-0.102	--	0.133	--	--	-0.293**
	(0.040)	(0.158)	(0.084)	(0.152)	(0.159)		(0.084)			(0.104)
9	0.144**	0.345**	0.172**	0.381**	-0.194	--	--	0.166**	--	-0.339**
	(0.038)	(0.153)	(0.082)	(0.153)	(0.166)			(0.078)		(0.107)

[£] When eas is included sample period is 82q3 to 92q1.

Standard errors in brackets. [&] Standard error for variable t/100 has been scaled accordingly.
** (*) significant at the 5% (10%) significance level. A Chow-test for structural stability could not be performed, however the text discusses other stability tests.

Table 1.1a (continued)
Diagnostics

Model	4th order ser. corr. (1st order ser. corr.) Chi² (4) (Chi² (1))	Funct. Form Chi² (1)	Normality Chi² (2)	Heteroscedasticity Chi² (1)	SE	adj.R^2
0	4.607 [0.330] (1.783 [0.182])	1.049 [0.306]	0.562 [0.755]	0.004 [0.945]	0.036	0.955
1	3.109 [0.540] (0.302 [0.582])	0.772 [0.379]	1.677 [0.432]	0.281 [0.596]	0.032	0.964
2	2.352 [0.671] (0.680 [0.409])	0.822 [0.364]	0.178 [0.915]	0.001 [0.973]	0.034	0.960
3	2.265 [0.687] (0.207 [0.648])	0.992 [0.319]	1.970 [0.373]	0.092 [0.761]	0.033	0.962
4	2.806 [0.591] (1.039 [0.308])	0.851 [0.356]	0.055 [0.973]	0.009 [0.921]	0.035	0.958
5	2.982 [0.561] (1.594 [0.207])	1.287 [0.257]	0.782 [0.676]	0.002 [0.968]	0.036	0.955
6	2.347 [0.672] (0.400 [0.527])	0.415 [0.519]	0.794 [0.672]	1.234 [0.266]	0.032	0.963
7	1.867 [0.760] (0.479 [0.489])	0.632 [0.427]	0.862 [0.650]	0.676 [0.411]	0.033	0.962
8	4.686 [0.321] (1.230 [0.267])	0.650 [0.420]	0.104 [0.949]	0.0001[0.995]	0.035	0.957
9	3.887 [0.422] (0.793 [0.373])	0.549 [0.459]	0.163 [0.921]	0.061 [0.804]	0.034	0.960

Probability values in brackets.

Table 1.1b

OLS regression on ln(A/U) without time trend;period 82q3 to 92q2(92q1[£])

Model	ln(V/U)	$\ln\hat{c}$	Δln(V/U)	ln(A/U)$_{-1}$	Rest$_S$	Rest$_L$	Rest$_T$	Eas/V	const
0	0.156**	0.430**	0.178*	0.501**	--	--	--	--	-0.122
	(0.041)	(0.161)	(0.089)	(0.157)					(0.077)
1	0.152**	0.299*	0.114	0.280*	0.082**	0.040	--	-1.343	-0.462**
	(0.040)	(0.173)	(0.089)	(0.162)	(0.037)	(0.054)		(0.928)	(0.134)
2	0.149**	0.284	0.142	0.426**	--	--	0.096*	-0.668	-0.347**
	(0.042)	(0.183)	(0.092)	(0.151)			(0.052)	(0.915)	(0.133)
3	0.159**	0.355**	0.111	0.259	0.092**	--	--	-1.093	-0.420**
	(0.038)	(0.153)	(0.088)	(0.158)	(0.034)			(0.859)	(0.124)
4	0.154**	0.314*	0.148	0.446**	--	0.085	--	-0.373	-0.294**
	(0.042)	(0.183)	(0.093)	(0.153)		(0.054)		(0.872)	(0.122)
5	0.172**	0.457**	0.151	0.444**	--	--	--	0.518	-0.143*
	(0.042)	(0.163)	(0.096)	(0.157)				(0.679)	(0.076)
6	0.152**	0.408**	0.168**	0.309*	0.061*	0.015	--	--	-0.356**
	(0.038)	(0.155)	(0.081)	(0.162)	(0.032)	(0.050)			(0.105)
7	0.154**	0.424**	0.164**	0.297*	0.068**	--	--	--	-0.348**
	(0.037)	(0.143)	(0.079)	(0.154)	(0.022)				(0.101)

Table 1.1b
OLS regression on ln(A/U) without time trend (continued)

Model	ln(V/U)	$\ln\hat{e}$	Δln(V/U)	ln(A/U)$_{-1}$	Rest$_s$	Rest$_L$	Rest$_T$	Eas/V	const
8	0.144**	0.339**	0.189**	0.455**	--	0.085**	--	--	-0.288**
	(0.040)	(0.157)	(0.084)	(0.149)		(0.037)			(0.103)
9	0.142**	0.341**	0.185**	0.430**	--	--	0.082**	--	-0.314**
	(0.039)	(0.154)	(0.082)	(0.148)			(0.033)		(0.106)

[£] When eas is included sample period is 82q3 to 92q1.

Standard errors in brackets. ** (*) significant at the 5% (10%) significance level. A Chow-test for structural stability could not be performed, however the text discusses other stability tests.

Table 1.1b (continued)
Diagnostics

Model	4th order ser. corr. (1st order ser. corr.) Chi^2 (4) (Chi^2 (1))	Funct. Form Chi^2 (1)	Normality Chi^2 (2)	Heteroscedasticity Chi^2 (1)	SE	adj.R^2
0	1.924 [0.750] (0.560 [0.454])	2.481 [0.115]	1.540 [0.463]	0.094 [0.759]	0.037	0.953
1	2.384 [0.666] (0.503 [0.478])	0.768 [0.381]	2.009 [0.366]	0.028 [0.867]	0.033	0.963
2	3.161 [0.574] (1.206 [0.272])	0.843 [0.358]	0.357 [0.836]	0.104 [0.746]	0.034	0.959
3	1.554 [0.817] (0.316 [0.574])	0.907 [0.341]	1.999 [0.368]	0.006 [0.937]	0.033	0.963
4	3.538 [0.472] (1.391 [0.238])	0.875 [0.349]	0.254 [0.881]	0.095 [0.757]	0.035	0.958
5	2.069 [0.723] (1.366 [0.242])	1.568 [0.210]	0.954 [0.620]	0.074 [0.785]	0.036	0.956
6	2.312 [0.679] (1.009 [0.315])	0.378 [0.538]	1.011 [0.603]	0.185 [0.667]	0.033	0.961
7	1.941 [0.747] (0.888 [0.346])	0.451 [0.501]	0.984 [0.611]	0.265 [0.607]	0.033	0.963
8	5.441 [0.245] (1.522 [0.217])	0.612 [0.434]	0.210 [0.900]	0.009 [0.921]	0.034	0.958
9	5.254 [0.262] (1.438 [0.230])	0.515 [0.473]	0.295 [0.863]	0.001 [0.973]	0.034	0.959

Probability values in brackets.

Table 1.2a
Prediction error calculations with trend

Model	$\hat{E}_{ccv}$	% Change over Model 0	$N/(N-K)^2*RSS$	% Difference of $\hat{E}_{ccv}$&$N/(N-K)^2*RSS$
		With 39 observations		
0	0.0017619	--	--	--
1	0.0018683	+ 6.0	0.0015328	17.95
2	0.0017063	- 3.2	0.0016738	1.90
3	0.0017903	+ 1.6	0.0015644	12.61
4	0.0018359	+ 4.2	0.0017691	3.63
5	0.0018749	+ 6.4	0.0018112	3.39
6	0.0016746	- 4.9	--	--
7	0.0016102	- 8.6	--	--
8	0.0017163	- 2.6	--	--
9	0.0015842	-10.1	--	--
		With 40 observations		
0	0.0017265	--	0.0016864	2.32
6	0.0016599	- 3.8	0.0014754	11.11
7	0.0015735	- 8.9	0.0014764	6.17
8	0.0017313	+ 0.3	0.0016616	4.02
9	0.0015905	- 7.9	0.0015680	1.41

Table 1.2b
Prediction error calculations without trend

Model	$\hat{E}_{ccv}$	% Change over Model 0	$N/(N-K)^2$*RSS	% Difference of $\hat{E}_{ccv}$&$N/(N-K)^2$*RSS
		With 39 observations		
0	0.0016421	--	--	--
1	0.0018581	+13.2	0.0015449	16.85
2	0.0016683	+ 1.6	0.0016437	1.47
3	0.0016103	- 1.9	0.0014687	8.79
4	0.0017243	+ 5.0	0.0016930	1.81
5	0.0017256	+ 5.1	0.0017169	0.50
6	0.0017523	+ 6.7	--	--
7	0.0014964	- 8.9	--	--
8	0.0016305	- 0.7	--	--
9	0.0015946	- 3.0	--	--
		With 40 observations		
0	0.0017575	--	0.0017263	1.77
6	0.0016816	- 4.3	0.0014994	10.83
7	0.0014449	-17.7	0.0014086	2.51
8	0.0016085	- 8.4	0.0015775	1.92
9	0.0015507	-11.7	0.0015354	0.98

Table 1.3
SURE Regressions on $\Delta\ln(A/U)_d$; Sample Period 82q3 92q2

Duration	ln (V/U)	ln s_d	ln $(A/U)_{d,-1}$	t/100	$Rest_s$	SE	adj.R^2
0 - 1	0.382**	0.205	-1.340**	0.753**	-0.154**	0.054	0.792
	(0.056)	(0.175)	(0.154)	(0.185)[&]	(0.045)		
1 - 2	0.115	-0.290	-1.244**	-0.467*	0.225**	0.086	0.755
	(0.077)	(0.304)	(0.144)	(0.269)	(0.073)		
2 - 3	0.344**	0.484**	-0.846**	-0.136	0.179**	0.069	0.739
	(0.058)	(0.154)	(0.125)	(0.211)	(0.063)		
3 - 4	0.212**	0.208	-0.802**	-1.011**	0.136**	0.065	0.739
	(0.063)	(0.151)	(0.144)	(0.294)	(0.056)		
4+	0.166*	-0.457**	-1.201**	-0.340	0.355**	0.151	0.820
	(0.092)	(0.211)	(0.147)	(0.482)	(0.162)		

Standard errors in parentheses. [&] The standard errors of the variable time have been scaled appropriately. The coefficients on the variables $\Delta\ln(V/U)$ and $\Delta rests$ which were included in the regressions are not recorded in the table. ** (*) = significant at 5% (10%) significance level.

LM-test for serial correlation: 8.896; $Chi^2(4)_{0.05}$ = 9.48.

TABLE 1.4
SURE Regressions on $\Delta\ln (A/U)_d$; Sample Period 82q2 92q2

Duration	ln (V/U)	ln s_d	ln $(A/U)_{d,-1}$	t/100	$Rest_L$	SE	adj.R^2
0 - 1	0.269**	0.019	-1.134**	0.724**	-0.228*	0.059	0.781
	(0.049)	(0.181)	(0.140)	(0.298)[&]	(0.130)		
1 - 2	0.259**	0.114	-1.074**	0.485	-0.148	0.092	0.719
	(0.077)	(0.326)	(0.130)	(0.421)	(0.190)		
2 - 3	0.356**	0.376**	-0.732**	0.128	0.073	0.077	0.672
	(0.063)	(0.176)	(0.116)	(0.315)	(0.152)		
3 - 4	0.179**	0.067	-0.718**	-1.013**	0.197	0.069	0.695
	(0.062)	(0.137)	(0.136)	(0.311)	(0.132)		
4+	0.226**	-0.388**	-1.002**	-0.443	0.548	0.160	0.798
	(0.089)	(0.190)	(0.129)	(0.695)	(0.364)		

Standard errors in parentheses. [&] The standard errors of the variable time have been scaled appropriately. The coefficients on the variable $\Delta\ln(V/U)$ which was included in the regressions are not recorded in the table. ** (*) = significant a 5% (10%) significance level.

LM-test for serial correlation: 5.633; $Chi^2(4)_{0.05}$ = 9.48.

Table 1.5
SURE Regressions on $\Delta\ln(A/U)_d$; Sample Period 82q2 92q2

Duration	$\ln(V/U)$	$\ln s_d$	$\ln(A/U)_{d,-1}$	t/100	$Rest_T$	SE	adj.R^2
0 - 1	0.306**	0.012	-1.206**	0.927**	-0.277**	0.057	0.796
	(0.052)	(0.178)	(0.141)	(0.301)[&]	(0.114)		
1 - 2	0.232**	0.034	-1.071**	0.153	0.015	0.093	0.713
	(0.081)	(0.328)	(0.133)	(0.433)	(0.171)		
2 - 3	0.343**	0.344**	-0.777**	-0.110	0.179	0.077	0.676
	(0.063)	(0.171)	(0.118)	(0.316)	(0.135)		
3 - 4	0.175**	0.068	-0.763**	-1.164**	0.221*	0.068	0.703
	(0.062)	(0.136)	(0.135)	(0.318)	(0.115)		
4+	0.191**	-0.360*	-1.017**	-0.715	0.615*	0.157	0.806
	(0.090)	(0.199)	(0.129)	(0.724)	(0.339)		

Standard errors in parentheses. [&] The standard errors of the variable time have been scaled appropriately. The coefficients on the variable $\Delta\ln(V/U)$ which was included in the regressions are not recorded in the table. ** (*) = significant at 5% (10%) significance level.

LM-test for serial correlation: 5.223; $Chi^2(4)_{0.05} = 9.48$.

Table 1.6
SURE Regressions on $\Delta \ln (A/U)_d$; Sample Period 82q3 92q1

Duration	ln (V/U)	ln s_d	ln $(A/U)_{d,-1}$	t/100	Eas/V	SE	adj.R^2
0 - 1	0.294**	0.308	-1.173**	0.315*	-0.617	0.059	0.758
	(0.058)	(0.210)	(0.166)	(0.170)[&]	(1.364)		
1 - 2	0.236**	-0.072	-1.037**	-0.026	1.579	0.092	0.718
	(0.087)	(0.350)	(0.174)	(0.262)	(2.181)		
2 - 3	0.361**	0.423**	-0.615**	-0.014	2.948*	0.069	0.741
	(0.064)	(0.160)	(0.108)	(0.180)	(1.547)		
3 - 4	0.275**	0.265	-0.623**	-0.672**	1.784	0.065	0.739
	(0.077)	(0.181)	(0.141)	(0.258)	(1.545)		
4+	0.225**	-0.685**	-1.103**	0.034	8.016*	0.157	0.811
	(0.096)	(0.235)	(0.148)	(0.458)	(4.321)		

Standard errors in parentheses. [&] The standard errors of the variable time have been scaled appropriately. The coefficients on the variables $\Delta \ln(V/U)$ and Δeas which were included in the regressions are not recorded in the table. ** (*) = significant at the 5% (10%) significance level.

LM-test for serial correlation: 4.257; $Chi^2(4)_{0.05} = 9.48$.

Table 1.7
Long-run relationships implied by SUR estimation

For variable $Rest_T$

$$\ln[\frac{A}{U}]_1 = 0.253\ln\frac{V}{U} + 0.768\frac{t}{100} - 0.229Rest_T$$

$$\ln[\frac{A}{U}]_3 = 0.441\ln\frac{V}{U} + 0.442\ln s_d + 0.230Rest_T$$

$$\ln[\frac{A}{U}]_4 = 0.229\ln\frac{V}{U} - 1.525\frac{t}{100} + 0.289Rest_T$$

$$\ln[\frac{A}{U}]_5 = 0.188\ln\frac{V}{U} - 0.354\ln s_d + 0.604Rest_T$$

For variable EAS/V

$$\ln[\frac{A}{U}]_3 = 0.586\ln\frac{V}{U} + 0.687\ln s_d + 4.793\frac{EAS}{V}$$

$$\ln[\frac{A}{U}]_5 = 0.204\ln\frac{V}{U} - 0.621\ln s_d + 7.267\frac{EAS}{V}$$

Table 1.8
Steady state impact calculations of ALMP on duration-specific outflow rates

(1) $\Delta_{2-1}\ln(A/U)_d$	(2) contribution of ALMP to (1) $Rest_T$(=R);EAS/V(=E)	(3) Actual $(A/U)_{d,2}$	(4) $(A/U)_{d,2}$ w/o ALMP
$\Delta_{2-1}\ln(A/U)_1$=0.1538	(R) -0.1529	0.4574	0.5329
$\Delta_{2-1}\ln(A/U)_3$=0.5236	(R) +0.1535$	0.3496	0.2998
	(E) +0.0479	0.3496	0.3333
$\Delta_{2-1}\ln(A/U)_4$=0.0122	(R) +0.1929	0.2765	0.2279
$\Delta_{2-1}\ln(A/U)_5$=0.4731	(R) +0.4032	0.1789	0.1196
	(E) +0.0726	0.1789	0.1665

Δ_{2-1}=difference taken between 2 steady state quarters; ALMP=Active Labour Market Policy; $(A/U)_{d,2}$=duration-specific outflow rate of 2nd steady state quarter.
[$] Coefficient on $Rest_T$ in SUR estimation of $(A/U)_3$ has a probability value of 0.190.

Table 1.9
Steady state simulations of the effect of $Rest_T$ and EAS/V on long-term unemployment

Probabilities used	$\hat{I}_{L,2}$	$\hat{U}_{L,2}$	$\hat{U}_{L,2}-U_{L,1}$	Fall in LTU due to ALMP absolute numbers (in %)
I. Restart present and increase of EAS/V by 52% .				
$p_{1,2}$=0.4574; $p_{2,2}$=0.3807 $p_{3,2}$=0.3496; $p_{4,2}$=0.2765 $p_{5,2}$=0.1789.	67438	376954	-466376	--
II. Restart not present and assuming $Rest_T$ affects $(A/U)_3$.				
$p_{1,2}$=0.5329; $p_{2,2}$=0.3807 $p_{3,2}$=0.2998; $p_{4,2}$=0.2279 $p_{5,2}$=0.1196.	64270	537374	-305956	160420 (35%)
III. Restart not present and assuming $Rest_T$ does not affect $(A/U)_3$.				
$p_{1,2}$=0.5329; $p_{2,2}$=0.3807 $p_{3,2}$=0.3496; $p_{4,2}$=0.2279 $p_{5,2}$=0.1196.	59697	499139	-344191	122185 (26%)
IV. Increase of EAS/V by 52% .				
$p_{1,2}$=0.4574; $p_{2,2}$=0.3807 $p_{3,2}$=0.3333; $p_{4,2}$=0.2765 $p_{5,2}$=0.1665.	69131	415201	-428129	38247 (8%)

Note: $U_{1,2}$=358120; $U_{L,1}$=843330 .

Table 1.A1
h values for models with 40 observations

In column 5 we show the actual mean, k/N and the critical values = 2k/N. Note that critical values are only meaningful if k/N < 0.4.

Model 0:

0.3419	0.2881	0.2692	0.3396	mean=0.2249
0.1674	0.1559	0.1470	0.1615	k/N =0.2250
0.1289	0.1933	0.1676	0.1809	2k/N=0.4500
0.1210	0.1434	0.1427	0.2290	
0.1760	0.1528	0.2385	0.2164	
0.1821	0.1705	0.2031	0.1793	
0.1544	0.1498	0.2300	0.2306	
0.1864	0.2269	0.2125	0.2583	
0.2458	0.3015	0.3453	0.2734	
0.3462	0.4209	0.3087	0.4115	

Model 6:

0.3494	0.3180	0.2774	0.3725	mean=0.2749
0.1701	0.1571	0.1498	0.1747	k/N =0.2750
0.1396	0.2012	0.1960	0.1926	2k/N=0.5500
0.2248	0.2499	0.2736	0.2818	
0.3228	0.3788	0.4823	0.2199	
0.2958	0.4150	0.2288	0.1859	
0.1620	0.1981	0.2341	0.2466	
0.1934	0.2427	0.2271	0.3580	
0.2697	0.3275	0.3581	0.3269	
0.3743	0.4671	0.3269	0.4276	

Model 7:

0.3450	0.2974	0.2736	0.3514	mean=0.2499
0.1700	0.1568	0.1470	0.1732	k/N =0.2500
0.1289	0.1976	0.1680	0.1848	2k/N=0.5000
0.1535	0.1852	0.1702	0.2291	
0.2443	0.2395	0.3110	0.2180	
0.2956	0.4125	0.2190	0.1800	
0.1615	0.1928	0.2339	0.2393	
0.1919	0.2331	0.2156	0.3395	
0.2477	0.3053	0.3550	0.2775	
0.3462	0.4579	0.3267	0.4225	

Model 8:

0.3455	0.3116	0.2738	0.3640	mean=0.2499
0.1676	0.1561	0.1497	0.1640	k/N =0.2500
0.1396	0.1961	0.1947	0.1875	2k/N=0.5000
0.2023	0.2191	0.2568	0.2813	
0.2385	0.2677	0.3844	0.2187	
0.1844	0.1811	0.2102	0.1847	
0.1555	0.1588	0.2301	0.2362	
0.1873	0.2382	0.2253	0.2859	
0.2690	0.3254	0.3496	0.3254	
0.3740	0.4344	0.3087	0.4150	

Table 1.A1
h Values for models with 40 Observations (continued)

Model 9:

0.3442	0.3205	0.2755	0.3666	mean=0.2499
0.1680	0.1559	0.1497	0.1665	k/N =0.2500
0.1386	0.1940	0.1924	0.1854	2k/N=0.5000
0.2203	0.2401	0.2761	0.2794	
0.2060	0.2170	0.3239	0.2179	
0.2049	0.2274	0.2036	0.1812	
0.1556	0.1650	0.2310	0.2324	
0.1866	0.2435	0.2258	0.3042	
0.2622	0.3228	0.3533	0.3183	
0.3619	0.4569	0.3114	0.4116	

Note: The matrices should be read across columns, e.g. h_{22} is the entry in the first row, second column and h_{66} is the entry in the second row, second column. All models are with a time trend.

Table 1.A2
h values of models with 39 observations

In column 5 we show the actual mean, k/N and the critical values = 2k/N. Note that critical values are only meaningful if k/N < 0.4. Starred entries exceed the critical value.

Model 1:

0.3863	0.3326	0.2839	0.4044	mean=0.3076
0.1827	0.1759	0.2261	0.2109	k/N =0.3076
0.1487	0.2101	0.2107	0.1990	2k/N=0.6153
0.2251	0.2505	0.2750	0.2884	
0.3229	0.3902	0.5191	0.5198	
0.5168	0.4185	0.2323	0.1968	
0.1908	0.2394	0.2462	0.2939	
0.2203	0.2430	0.2336	0.3678	
0.2780	0.3694	0.3981	0.3433	
0.4046	0.6209*	0.4221		

Model 2:

0.3651	0.3336	0.2831	0.3979	mean=0.2819
0.1767	0.1761	0.2155	0.1879	k/N =0.2820
0.1454	0.2032	0.2144	0.1889	2k/N=0.5641
0.2210	0.2409	0.2775	0.2831	
0.2284	0.2379	0.3243	0.4768	
0.4983	0.2500	0.2161	0.1950	
0.1732	0.1850	0.2454	0.2953	
0.2013	0.2436	0.2316	0.3192	
0.2720	0.3606	0.3972	0.3384	
0.3982	0.6170*	0.3828		

Model 3:

0.3831	0.3130	0.2815	0.3880	mean=0.2819
0.1823	0.1746	0.2256	0.2082	k/N =0.2820
0.1404	0.2078	0.1784	0.1905	2k/N=0.5641
0.1558	0.1876	0.1758	0.2338	
0.2451	0.2478	0.3557	0.5099	
0.5151	0.4165	0.2226	0.1902	
0.1892	0.2306	0.2455	0.2841	
0.2197	0.2334	0.2201	0.3464	
0.2586	0.3442	0.3961	0.2985	
0.3783	0.6026*	0.4213		

Model 4:

0.3672	0.3320	0.2824	0.3918	mean=0.2820
0.1753	0.1757	0.2155	0.1806	k/N =0.2820
0.1474	0.2045	0.2106	0.1917	2k/N=0.5641
0.2058	0.2234	0.2644	0.2870	
0.2543	0.2841	0.3875	0.4611	
0.4993	0.2199	0.2221	0.1966	
0.1710	0.1745	0.2460	0.2939	
0.2012	0.2384	0.2321	0.3085	
0.2765	0.3531	0.3981	0.3391	
0.4027	0.6048*	0.3780		

Table 1.A2
h Values of Models with 39 Observations (continued)

Model 5:

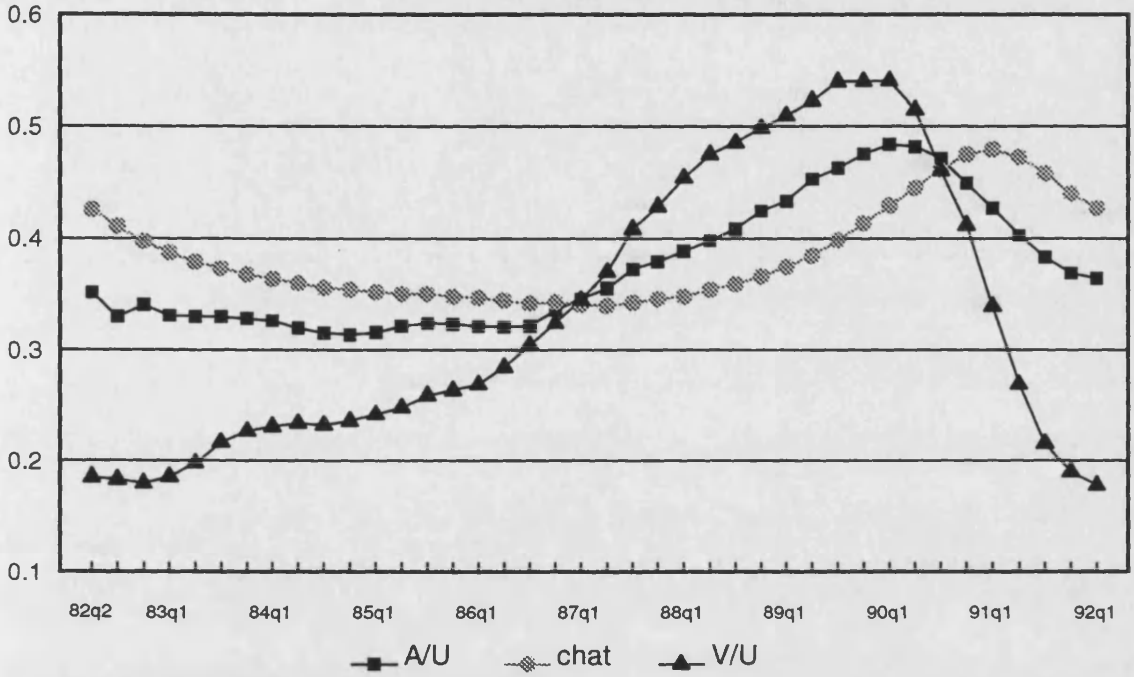
0.3650	0.3118	0.2797	0.3731	mean=0.2563
0.1746	0.1744	0.2153	0.1764	k/N =0.2564
0.1395	0.2027	0.1778	0.1843	2k/N=0.5128
0.1307	0.1540	0.1599	0.2335	
0.1864	0.1584	0.2440	0.4472	
0.4983	0.2140	0.2138	0.1899	
0.1685	0.1617	0.2454	0.2841	
0.2010	0.2278	0.2178	0.2814	
0.2563	0.3247	0.3961	0.2920	
0.3751	0.5838*	0.3778		

Note: The matrices should be read across columns, e.g. h_{22} is the entry in the first row, second column and h_{66} is the entry in the second row, second column. All models are with a time trend.

Figure 1.1

Labour Market Variables

Great Britain : 1982 q2 - 1992 q1

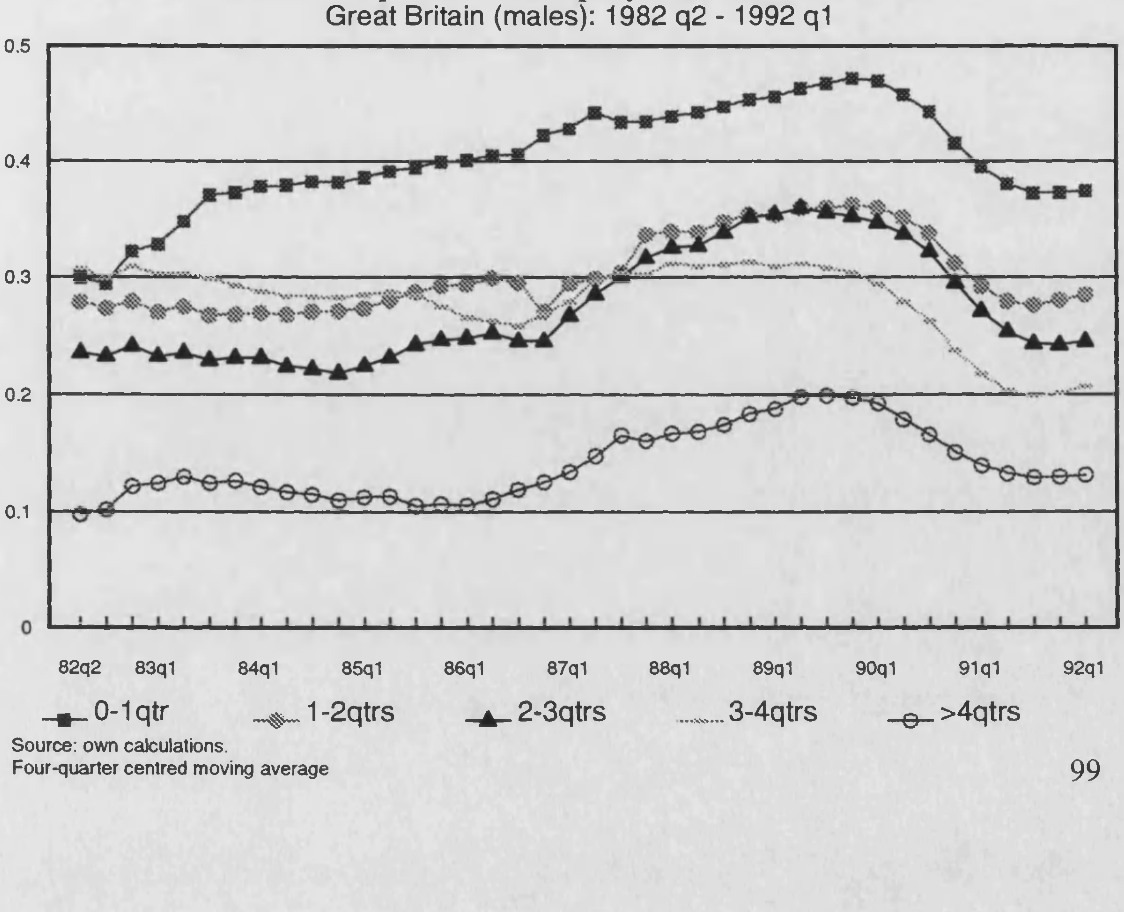


Source: own calculations. Vacancies are for females and males.
Four-quarter centred moving average

Figure 1.2

Duration Specific Unemployment Outflow Rates

Great Britain (males): 1982 q2 - 1992 q1

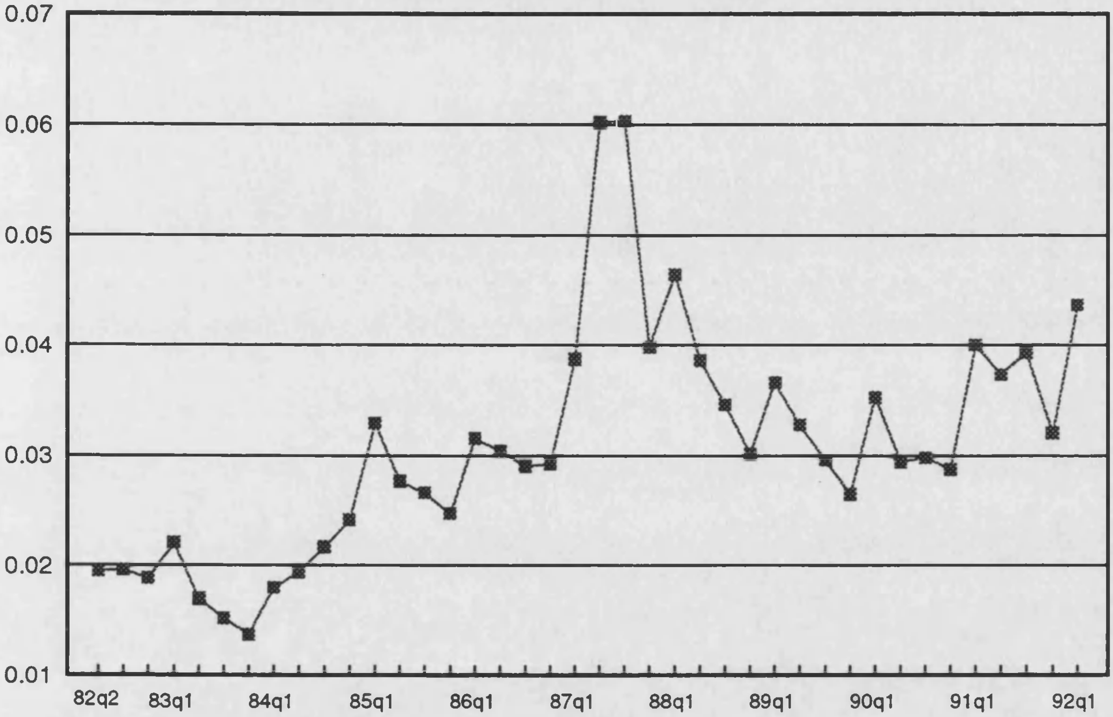


Source: own calculations.
Four-quarter centred moving average

Figure 1.3

Inflows into EAS / Vacancies (male and female)

Great Britain: 1982 q2 - 1992 q1

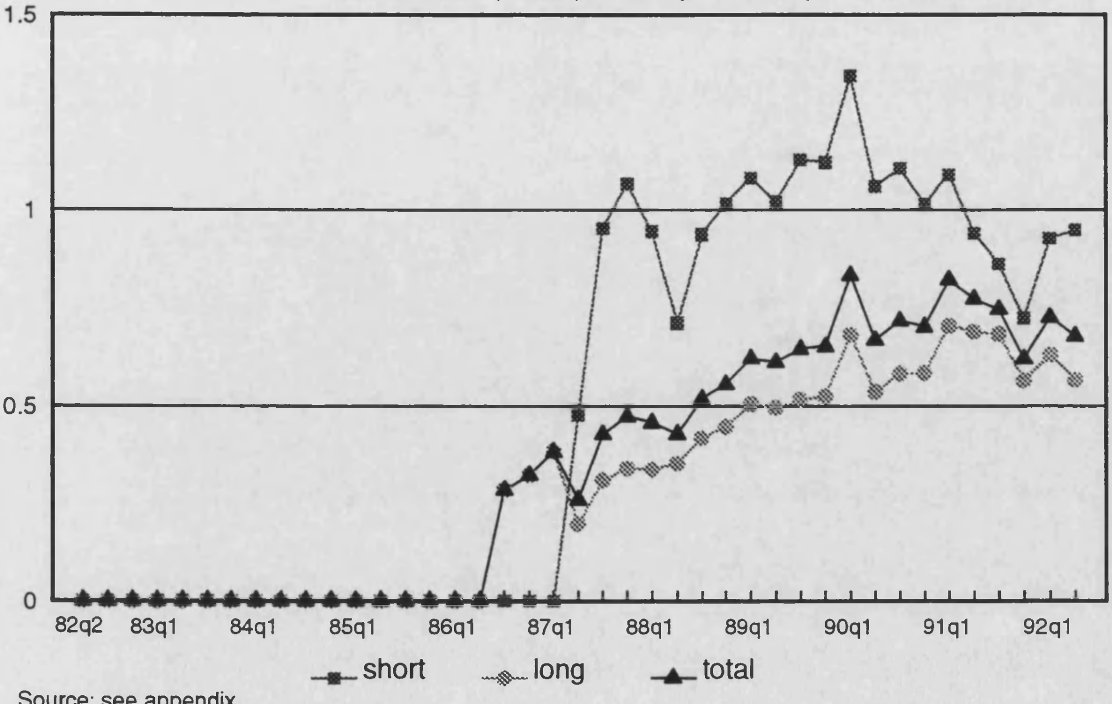


Source: see appendix.

Figure 1.4

Different Duration Types of Restart Participation

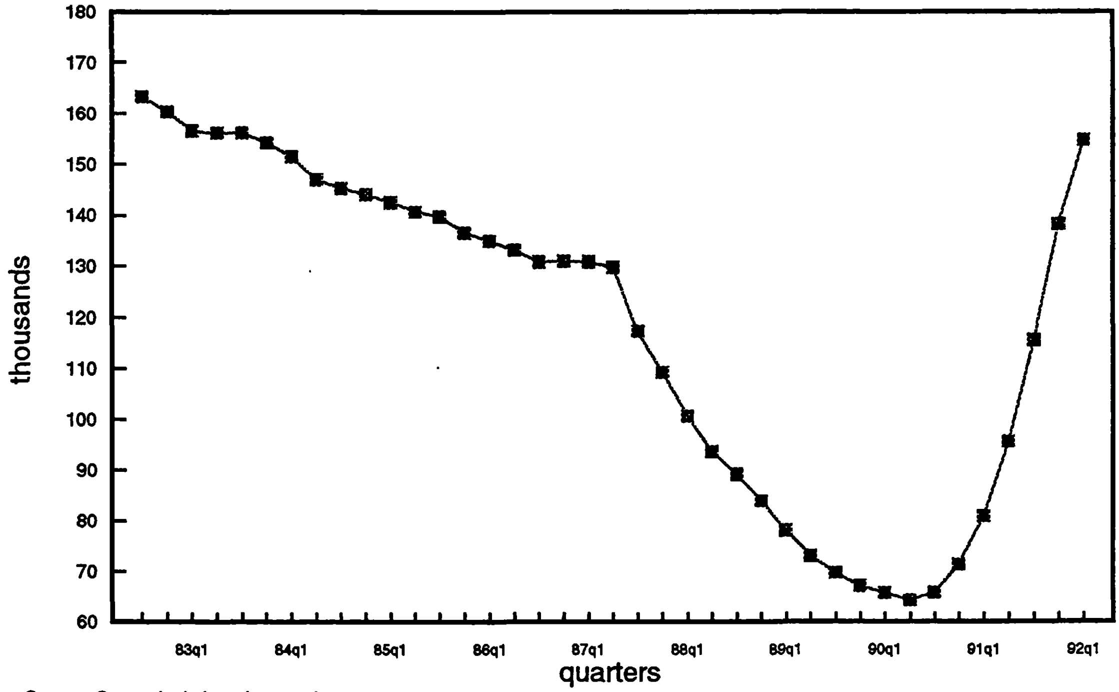
Great Britain (males): 1982 q2 - 1992 q2



Source: see appendix.

The participation types are explained in the text.

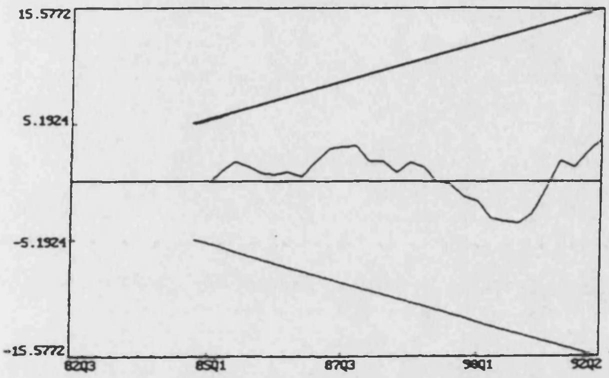
Figure 1.5
Estimated inflows into long-term unemployment
Britain (males): 1982q3 - 1992q1



Source: Own calculations (see text).
Four-quarter centred moving average.

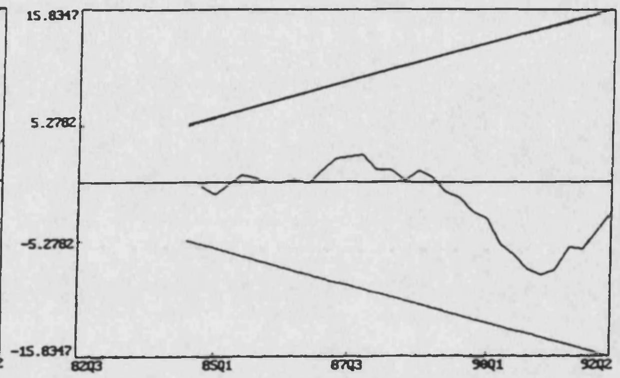
Figure A1.1
CUSUM Plots

Model 0 with time - Plot of Cumulative Sum of Recursive Residuals



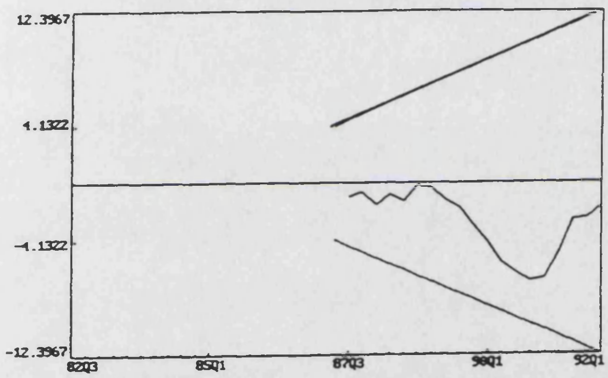
The straight lines represent critical bounds at 5% significance level

Model 0 w/o time - Plot of Cumulative Sum of Recursive Residuals



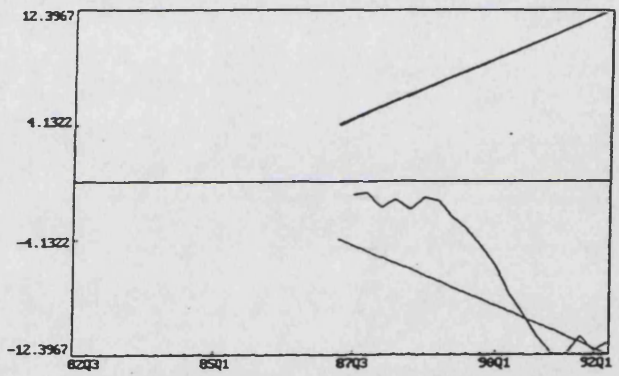
The straight lines represent critical bounds at 5% significance level

Model 1 with time - Plot of Cumulative Sum of Recursive Residuals



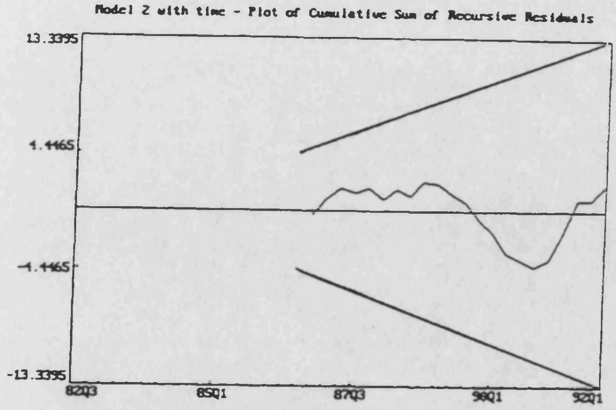
The straight lines represent critical bounds at 5% significance level

Model 1 w/o time - Plot of Cumulative Sum of Recursive Residuals



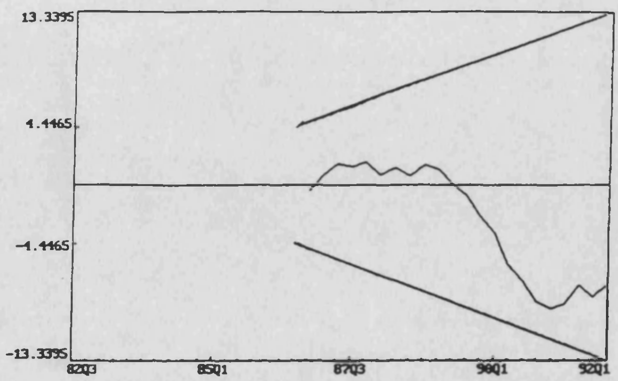
The straight lines represent critical bounds at 5% significance level

Model 2 with time - Plot of Cumulative Sum of Recursive Residuals



The straight lines represent critical bounds at 5% significance level

Model 2 w/o time - Plot of Cumulative Sum of Recursive Residuals



The straight lines represent critical bounds at 5% significance level

Figure A1.1
CUSUM Plots (continued)

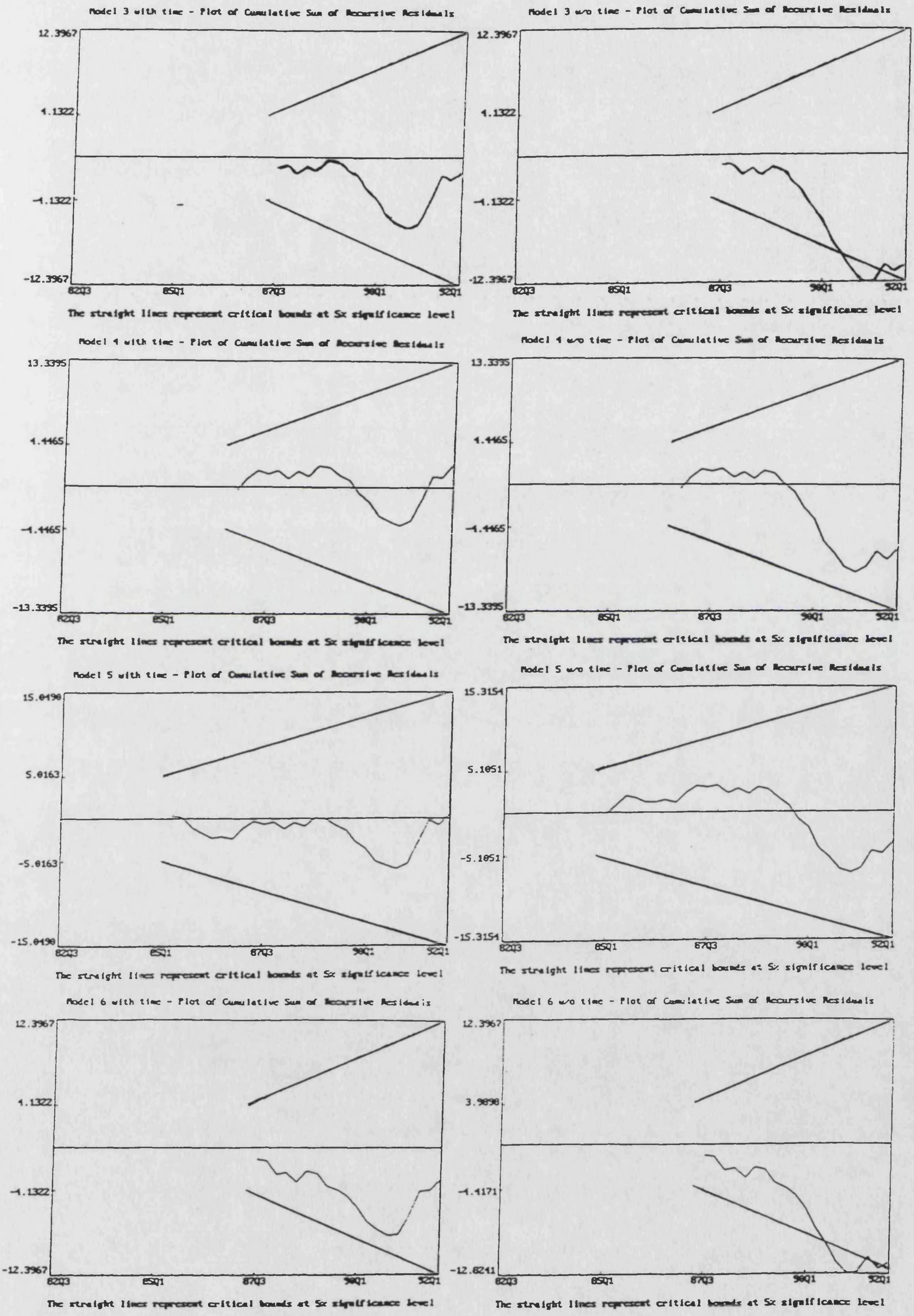
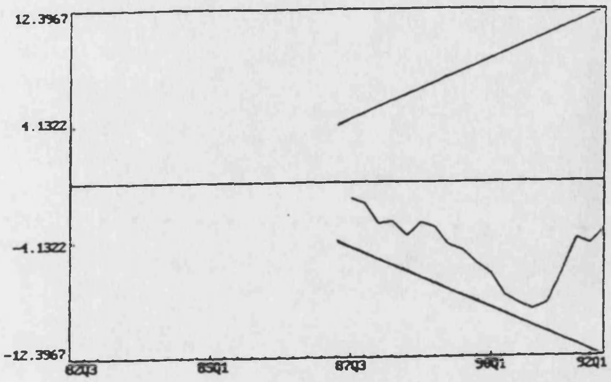


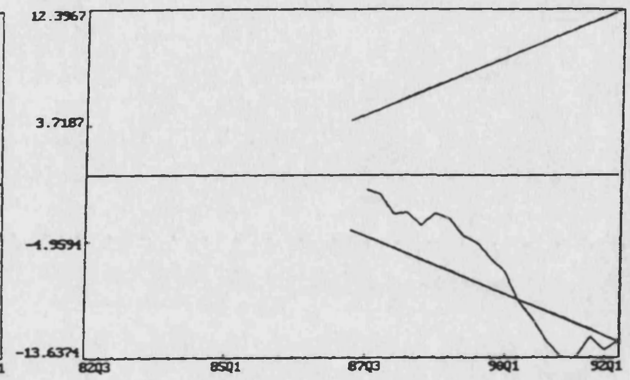
Figure A1.1
CUSUM Plots (continued)

Model 7 with time - Plot of Cumulative Sum of Recursive Residuals



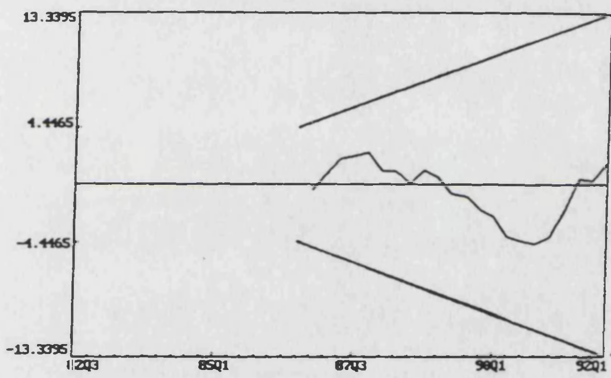
The straight lines represent critical bounds at 5% significance level

Model 7 w/o time - Plot of Cumulative Sum of Recursive Residuals



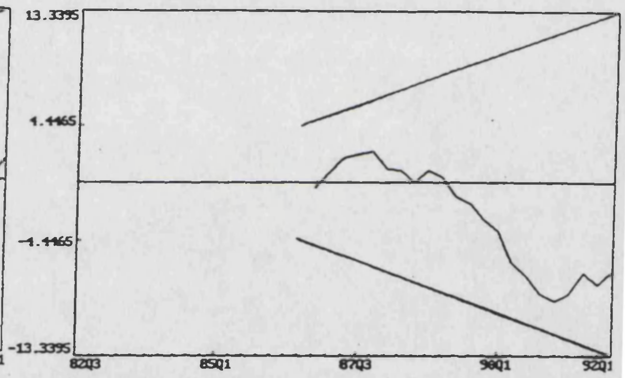
The straight lines represent critical bounds at 5% significance level

Model 8 with time - Plot of Cumulative Sum of Recursive Residuals



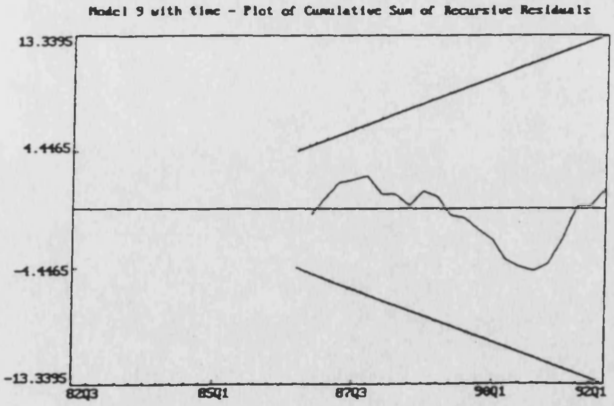
The straight lines represent critical bounds at 5% significance level

Model 8 w/o time - Plot of Cumulative Sum of Recursive Residuals



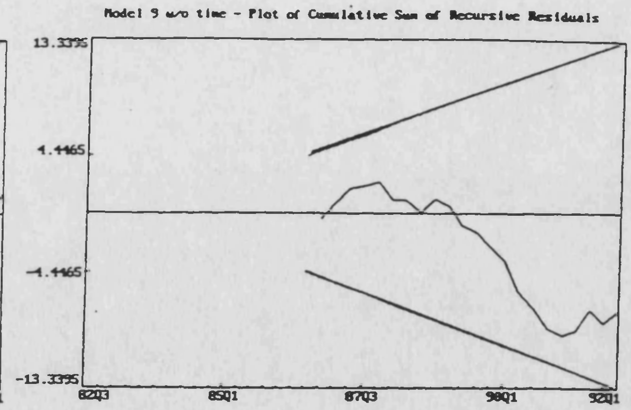
The straight lines represent critical bounds at 5% significance level

Model 9 with time - Plot of Cumulative Sum of Recursive Residuals



The straight lines represent critical bounds at 5% significance level

Model 9 w/o time - Plot of Cumulative Sum of Recursive Residuals



The straight lines represent critical bounds at 5% significance level

Chapter 2

Employment Schemes in Ireland: An Evaluation*

I Introduction

The primary aim of this chapter is to evaluate the effect which the following employment schemes (ES) had on the overall outflow rate and age-by-duration outflow rates from unemployment in Ireland from 1980(1) to 1989(4):

(a) Work Experience Programme (WEP);

(b) Employment Incentive Scheme (EIS);

(c) Enterprise Allowance Scheme (EAS);

(d) Teamwork (TWK);

(e) Social Employment Scheme (SES).

Over the eighties the proportion of long-term unemployed people in the total stock of unemployment has risen relentlessly for all age groups. The methodology used also allows us to test whether this change in the duration structure is an important factor in determining the overall outflow rate and age-by-duration outflow rates. The chapter is broken up into six more sections. Section II describes the composition and trend of unemployment in the eighties in some detail as the experience of the Irish labour market is not well known. Section II also describes the official aims of the ES, while Section III looks at the role of the ES and hysteresis. Sections IV and V look at the methodology used to evaluate the effect which ES and the changing duration structure have on the overall outflow rate and age-by-duration outflow rates and give the results of our estimations. Section VI gives an overall assessment of the schemes and makes some policy recommendations. Section VII summarises the main points.

II Unemployment Trends and the Official Aims of the Employment Schemes

The total stock of unemployment in Ireland has risen relentlessly between the beginning of the eighties and 1987; after that year we have a slight downward trend for the rest of the decade (cf. Figure 2.1). The flows into and out of unemployment, which underly its build-up are plotted in Figure 2.2. Figure 2.1 also shows that the duration structure has dramatically shifted during the eighties. Having divided the stock of unemployment into 3 duration categories (<6 months = short-term unemployment, 6-12 months, >12 months = long-term unemployment)[1] we can see that the proportion of those with an uninterrupted unemployment spell of more than 12 months was smaller than the proportion of short-term unemployment (a spell of less than 6 months) from 1980 to 1985, but then exceeded it until the end of the period while the relative magnitude of the 6-12 months duration category hardly changed. The age structure of the stock of unemployment, on the other hand, did not experience such dramatic change. Figure 2.3 shows the development of three age categories (<20 years, 20-44 years, >44 years) from 1980 to 1989. Clearly, throughout the period the 20-44-years category bore the main brunt of unemployment.

The stability of the age structure of unemployment in the eighties can also be seen in Figure 2.4 where we compare the percentages of the three specified age groups on the Live Register in April 1982 and October 1988. Between these dates the proportion of the middle-aged unemployed rose by 3.8 percentage points at the nearly equal expense of the other two age groups. So we have only a very insignificant shift in the age structure of unemployment. Similarly, Figure 2.5 which gives the percentages of these age groups in the labour force for 1982 and 1988, shows no remarkable change. Inspection of Figures 2.4 and 2.5 also shows that middle aged persons are over-represented on the Live Register in both periods while young persons have the same proportion on the register and in the labour force in 1982 and are slightly over-represented on the register in 1988. The relative incidence of unemployment for older persons is in both periods approximately 4 percentage points below their share of the labour force. Nevertheless, the age distribution of unemployment roughly corresponds to the age distribution of the labour force[2].

The shift in the duration structure of unemployment, on the other hand, was quite dramatic for two duration categories between April 1982 and October 1988 (cf. Figure 2.6). While the 6-12 months duration category experienced a small fall in its relative magnitude between April 1982 and October 1988, the proportion of short-term unemployment decreased from 50 to 37 per cent and unemployment spells longer than 12 months rose from 31.8 per cent to 46.6 per cent. The changing age-by-duration structure of unemployment can be seen in Figures 2.7, 2.8 and 2.9. For all age groups we can observe swings from short-term to long-term unemployment of about the same magnitude. However, the duration stocks are quite different for the various age groups in both periods. For example, in 1982 two thirds of all young unemployed were in short-term unemployment with only 18 per cent in long-term unemployment the older unemployed were already experiencing more long-term than short-term unemployment

(45% compared with 37%). In 1988 half of all young unemployed still experienced spells of less than 6 months, although long-term unemployment in this age group had by then risen to about 32 per cent. The respective figures for the older unemployed in 1988 were 29 and 56 percent. The changes in the duration structure of the middle aged group mirrors the duration structure changes of the total stock of the unemployed (cf. Figures 2.8 and 2.6).[3]

Two points should be made on the basis of the data presented so far. First, long-term unemployment had become the most pressing issue in the Irish labour market by the end of the decade. Secondly, while all age groups experienced similar relative rises in long-term unemployment, its proportion in 1988 was nearly 25 percentage points higher for older unemployed persons than for the young unemployed (and 6 percentage points higher than for the middle aged). This must mean that even though an older person has a relatively smaller incidence of unemployment once he/she becomes unemployed his/her chances of leaving unemployment are much (or somewhat) smaller than those of the young (or middle aged) unemployed. The age structure was, through the prolonged spells of older unemployed affecting the overall level of unemployment.[4]

Over the last decade Ireland has been subject to tight monetary and fiscal constraints when dealing with unemployment. This led the government to turn to manpower policy as a means of alleviating unemployment. The primary objective of manpower policy, as stated in the White Paper (1986), was to deal with any structural changes in the Irish labour market by ensuring an adequate supply of skilled and highly qualified manpower for the needs of the economy. Its secondary objective was one of promoting more equal access to employment opportunities. Employment schemes were introduced to achieve this objective. Thus, manpower policy had an important social policy function. The evolution of schemes tended in the first instance to be ad hoc responses to particular difficulties at specific times. Many were originally designed as temporary to overcome a seemingly cyclical increase in total unemployment. Yet, as unemployment persisted the employment schemes became a permanent feature of government policy.

In general, the ES promoted more equal access to employment opportunities by (a) re-integrating disadvantaged groups into the labour force and (b) creating jobs for the unemployed. We look at five major employment schemes which account for all participants on the National Manpower Services (NMS) Programmes between 1980(1) and 1987(4) and for 97 per cent of participants on FAS employment schemes from 1988(1) to 1989(4). The basic details of the schemes are given in Table 2.1.

Two schemes (EIS and EAS) were aimed at direct job creation for the unemployed. Since 1984 EIS has made special provisions for the long-term unemployed, but participation levels have never exceeded 17 percent. The proportion of long-term unemployed on EAS has steadily grown since 1983 and reached 40 per cent at the end of the decade. The remaining three schemes tried to reintegrate disadvantaged groups. When looking at participation levels in Figures 2.10(a) and 2.10(b) we see an obvious swing from reintegrating young first-time job seekers to reintegrating the young (TWK) and other (SES) long-term unemployed. The government from 1984 onwards saw all the long-term unemployed as the main disadvantaged group rather than young first-time job seekers. So the government clearly did take account of the drammatically shifting duration structure of unemployment, across all age groups, in the formulation and application of manpower policy.

Up to 1986 SES and EIS accounted for the majority of scheme provisions for the long-term unemployed. The government announced the Direct Action Programme for the long-term unemployed in its White Paper (1986). Since then SES, EIS and EAS have accounted only for 50 per cent of the provisions for the long-term unemployed and FAS training schemes for the other 50 per cent.

Job creation for the unemployed has an obvious economic function as well as a social function. The White Paper (1986) stated that the reintegration of disadvantaged groups, apart from having a social function, was in the long-term interest of society. Whether intended or not this reintegration may have a longer term economic function. In a recovery period, if the employment schemes have reintegrated disadvantaged groups into the effective labour force, this will ensure that these groups do not become a major channel of hysteresis. This is the topic of the next section.

III The Role of Employment Schemes and Hysteresis

To understand the longer term economic function of the ES it is worth looking at the human capital explanation of hysteresis. The human capital explanation of hysteresis can be sketched as follows. After an adverse shock the inflow into unemployment increases. The longer people remain unemployed the more likely they are to experience a depreciation in skills and a reduction in job search intensity, resulting in an even longer duration of unemployment. This implies that the duration of the unemployment is state dependent. A competing theory would state that after the adverse shock the existing vacancies are filled from the best of the unemployed, leaving the less skilled and unqualified behind. Here workers are thought to be heterogeneous and the worst people are supposed to have the longest unemployment spells. The first scenario tells us that the longer people are unemployed the less search effective they are likely to be. One very important factor which reduces a long-term unemployed person's search effectiveness is the fact that employers use unemployment as a screening device and discriminate more against the long-term unemployed. This reduces the effective supply of labour. In the presence of a recovery employers do not consider the total pool of the unemployed for the growing vacancies but only a subset of the pool. This leads to increased wage pressure and unemployment cannot fall to its pre-shock level. Thus, unemployment results in a partial persistence in unemployment, i.e. hysteresis. Layard (1990b) thinks that long-term unemployment is still a major channel of hysteresis in the UK. He sees an obvious role for manpower policies to cure this type of hysteresis. By reintegrating the long-term unemployed into the labour force such policies will reduce wage pressure and allow unemployment to fall towards pre-shock levels.

The type of schemes proposed by Layard were introduced in Ireland during the eighties but their economic function was not appreciated. The objective was one of promoting more equal access to employment opportunities. Ireland has one of the highest incidence of long-term unemployment in the OECD. This may lead one to believe that long-term unemployment is a major channel of hysteresis. But this might not be the case for the following two reasons: First, the source of this type of hysteresis is the existence of a disadvantaged group outside the effective labour force. As in the UK the government in Ireland defines all long-term unemployed as the disadvantaged group outside the labour force. We believe that in the Irish case long-term unemployment is not a good enough definition of the disadvantaged group. Because of the severe lack of vacancies people of all ages and human capital levels may well drift into long-term unemployment. Many of the long-term unemployed would be considered for a vacancy, especially in a recovery period and this group would not reduce the effective supply of labour. We would argue that the group out of the effective labour force is comprised of people with minimal human capital levels and very long unemployment spells. It is this smaller group only, a subset of the long-term unemployed, which could be a source of hysteresis. Secondly, vacancies remained at very low levels through most of the eighties. For the given vacancies there was a plentiful effective supply of labour. Hence, the existence of a disadvantaged group cannot be a major source of wage pressure and therefore hysteresis. However, in times of a recovery, if the ES have failed to reintegrate the disadvantaged group into the effective labour force, the human capital explanation of hysteresis will become relevant. To evaluate the ES is also to see whether they can prevent hysteresis of this type, fulfilling their longer-term economic function. By the end of the eighties the government's active labour market policies were mainly targetting all the long-term unemployed. As explained above we feel, however, that the truly disadvantaged group is only a subset of the long-term unemployed. If placement officers take the best of the long-term unemployed[5], they might not be reintegrating the truly disadvantaged group. We, therefore, feel that the ES may not achieve their longer-term economic function.

A general policy recommendation to prevent hysteresis would be to identify and reintegrate the truly disadvantaged group outside the effective labour force. When we have long-term unemployment as the sole selection criterion for the relevant ES, we may fail to reintegrate this group. We strongly believe that more refined selection criteria should be developed for the ES so that the truly disadvantaged group is targeted. This will definitely be more equitable and also would prevent hysteresis in a recovery period.

IV The Effect of Employment Schemes on the Overall Outflow Rate

Many empirical studies work with unemployment as a stock. Additional insights can be gained by analysing the flows into and out of unemployment. In a steady state the stock of unemployment (U) can be expressed as a ratio of inflows over the outflow rate,

$$U = \frac{I}{A/U} = \frac{\text{inflow}}{\text{outflow rate}}, \text{ when } I = A$$

Figure 2.11 shows a moving average of the log of the overall outflow rate. Until the middle of 1985 we have a downward trend, after which the rate recovers slowly to the levels prevailing at the beginning of the decade. Using basic steady state calculations one can conclude that in Ireland the net fall in the outflow rate between the first quarter of 1981 and the second quarter of 1988 roughly explains 48 per cent of the rise in the stock of unemployment. The ES were introduced to increase the overall outflow rate. This increase can occur for two reasons: (a) entry onto a scheme implies a one-to-one outflow from the Live Register (LR) and (b) the function of some schemes is the reintegration of the disadvantaged group into the labour force, which will raise the outflow rate via increased search effectiveness after the brief, government financed employment spell. In theory ES should not increase inflow rates, but in practice some schemes (e.g. EIS and EAS) could have displacement of output and hence employment effects, implying that ES are positively correlated with the inflow rate. Here we do not model the inflow rate but consider it worthwhile doing.

The overall outflow rate function:

Outflow from the LR can be thought of having three destinations: (1) emigration, (2) employment and (3) out of the labour force. Following the approach taken by Jackman and Lehmann, (1990), let

$$A_t = f(V_t, \bar{c}_t U_t; e^{\lambda t}) \qquad (2.1),$$

where V_t is notified vacancies, and $\bar{c}_t$ Ut is the search effective part of the stock of unemployment, where

$$0 \leq \bar{c}_t \leq 1 \text{ and } \bar{c}_t = \hat{c}_t (1 + \Phi M_t)$$

and

(a) $M = \sum_{i=1}^{5} \beta_i ES_i$ is a weighted sum of the ES

(ES are expected to increase the average search effectiveness of the unemployed, i.e. $\Phi > 0$);

(b) $\hat{c}t = \Sigma_d \bar{a}_d g_{d,t}$ is a weighted sum of steady state exit rates from unemployment, where $\bar{a}_d$ is the steady state exit rate of the d-th duration group and $g_{d,t}$ is the proportion of this group to the total stock of unemployment in period t.

Since the steady state exit rate from unemployment declines with duration, the index $\hat{c}_t$ will fall as more of the unemployment stock drifts into long-term unemployment. This implies a lower average search effectiveness of the total unemployment stock. The time trend, $e^{\lambda t}$, controls for all other factors affecting the overall outflow rate and which are not modelled. Assuming CRS in V and $\bar{c}$U and log-linearising we can write (1) as

$$\ln\left(\frac{A}{U}\right)_t = \delta_1 \ln\left(\frac{V}{U}\right)_t + (1-\delta)_1 \ln \bar{c}_t + \delta_2\lambda_t \tag{2.2}$$

For small values of ΦM and removing the restrictions on the coefficients our estimable equation becomes:

$$\ln\left(\frac{A}{U}\right)_T = const. + seasonals + \delta_1 \ln\left(\frac{V}{U}\right)_t \tag{2.3}$$

$$+ \delta_2 \ln \hat{c}_t + \delta_2 \Phi M_t + \delta_{3\lambda t}/100 + e_t \text{ with } e_t \sim N(0,\sigma^2)$$

The restrictions on the coefficients in equation (2.2) would only allow ES to have an indirect effect on the overall outflow rate via the search effectiveness index. By dropping the restrictions the function gives a more general relationship between A/U and ES. The problem with the estimation of equation (3) is that how the outflow rate and ES are related is determined by numerous unknown factors which are not modelled. The coefficient on M will beside the indirect effect pick up the other intended direct effect which is the one-to-one outflow from the LR after entry onto a scheme. The coefficient may also pick up many distortive effects such as substitution effects which could lead to a negative relationship between the overall outflow rate and the ES. Yet we know that ES are intended to have a positive effect on the overall outflow rate without distortions.

Data:

(1) Employment Schemes: Monthly stocks of participation levels were made available to us for the entire decade by the Department of Labour. M, a weighted sum of the participation levels, is assumed exogenous to the stock of unemployment and

consequently the overall outflow rate from unemployment. This assumption is realistic considering the permanency of the employment schemes and the financing structure[6].

(2) The Irish Vacancy - Unemployment Rate: Theoretically this rate proxies the state of the Irish labour market. Since registered vacancies are very unreliable we used the MSL vacancy index which has been calculated by MSL International since 1977 as such a proxy. This index is based on all managerial job advertisements in Irish newspapers.

(3) The Overall Outflow Rate: Total inflows and the stock of unemployment form the basis of our calculations. This data is available from the CSO on a monthly basis. We interpolated quarterly inflows for the period 1980(1)-1982(4) from the age-by-duration structure of unemployment[7]. The overall outflow rate is derived from the following identity:

$I_t - A_t \equiv \Delta U_{t+1}$, which implies

$$\left(\frac{A}{U}\right)_t = \frac{I_t + U_t - U_{t+1}}{U_t} \tag{2.4}$$

Results of estimation

The following table gives our estimation results of equation (2.3).

OLS Regression on ln(A/U): Sample Period 80Q2-89Q4

K	ln(V/U)	ln $\hat{c}$	t/100	M	SE	$\bar{R}2$
2.6	0.2621	2.2747	1.870	-0.00003	0.092	0.79
(3.0)	(5.0)	(2.8)	(4.2)	(1.7)		

Absolute t-values in brackets.
DW = 1.64; LM-test of 4-th order serial correlation:
$\chi^2(4) = 2.8$.

The results say two important things:

1. $\hat{c}$ is significant, implying that as more unemployed drift into long-term unemployment the average search effectiveness of the total stock of unemployment is falling, thus lowering the overall outflow rate. So there is justification for the introducton of ES to reverse this falling average search effectiveness. This fall was due to either state dependence or heterogeneity or both, but clearly the goals of the ES could be achieved more easily, if the fall were due to state dependence. When state dependence dominates employment on a scheme can lead to the reconstruction of human capital levels attained before the incidence of unemployment[8]. Some people, after the end of this government sponsored employment spell, might on the basis of their regained skills directly flow into private employment. Those who flow back into unemployment will have a greater search effectiveness than before they participated in the scheme, thus increasing the average search effectiveness of the stock of the unemployed. If, on the other hand, heterogeneity is the main reason why certain people find themselves in the pool of long-term unemployment then the use of ES will only have small or no effects on the average search effectiveness of the unemployed and equity considerations must be the main justification for the application of such schemes.

2. The results are very discouraging since they show a negative relationship between the overall outflow rate and ES. It is likely that distortions cause negative effects which outweigh the intended positive effects of the ES. In the next section we analyse the determination of age-by-duration outflow rates to get deeper insights into this result.

V The Effect of Employment Schemes on Age-by-Duration Specific Outflow Rates

In this section we look at the effect which an individual ES has on each age-by-duration outflow rate. Theoretically an ES should only increase the outflow of its targeted group or groups and have no effect on non-targeted groups. But, in practice an ES can have a negative impact on the outflow rate of a non-targeted group via e.g. a substitution effect. (An employer who would otherwise have hired an unemployed person of a non-targeted group instead takes a person on an ES.) The following methodology will, however, not allow us to pick up pure substitution effects, because it tests for a general relationship between an employment scheme and a non-targeted group. This relationship can be determined by many other factors, e.g. ES change the duration structure of unemployment since many of the participants re-enter unemployment as short-term unemployed.

<u>The age-by-duration outflow rate functions:</u>

We can write these functions as

$$(A_t)^{age}_{dur} = g\left((\alpha_t U_t)^{age}_{dur},\ V_t;\ e^{\lambda_t} e^{\phi ES_i} \right) i=1,\dots,\ 5 \qquad (2.5)$$

where

(1) age = young (<25 years), middle aged (25-44), older (>44 years) and dur = STU (<6 months), LTU (>6 months);

(2) $(A_t)^{age}_{dur}$ = an age-by-duration specific outflow from unemployment;

(3) $(\alpha_t U_t)\,{}^{age}_{dur}$ = search effective part of the stock of unemployment of a particular age-by-duration category, with $0 \leq \alpha_t \leq 1$;

(4) $$(\alpha_t)\,{}^{age}_{dur} = \bar{a}\,{}^{age}_{dur}\,\frac{(U_t)^{age}_{dur}}{(U_t)^{age}},$$

i.e. it equals the steady state exit rate of an age-by-duration specific group weighted by the proportion of the duration specific stock of an age group over the total stock of this age group. This index controls for differences in search effectiveness of groups over time. It uses the empirical fact that the steady state exit rate is different for every age-by-duration group and controls for the changing duration structure within an age group and its effect on the search effective part of a particular age-by-duration group. V_t is measured as in the previous section and $e^{\lambda t}$ represents a time trend, which controls for other variables determining age-by-duration specific outflow rates. Assuming CRS in $(\alpha_t U_t)\,{}^{age}_{dur}$ and V_t, log-linearising (2.5) and dropping restrictions on coefficients, we arrive at the following estimable set of equations:

$$\Delta\ln\left\{\left[\frac{A}{U}\right]_t\right\}^{age}_{dur} = const. + seasonal + \delta_1 \ln\left[\frac{V_t}{(U_t)^{age}_{dur}}\right] + \delta_2\, lnd_t\,{}^{age}_{dur}$$

$$+ \delta_3 \phi ES_i + \delta_4 \ln \left\{ \left[\frac{A}{U}\right]_{-1} \right\}_{dur}^{age} + \delta_5 \lambda t/100 + e_t, e_t \sim N(0,\sigma^2). \tag{2.6}$$

Data:

The only new data to be discussed is the age-by-duration data from the LR which provides the basis for the age-by-duration outflow rates. It has been published semi-annually (April and October) since April 1980 by the CSO. We could aggregate the data only into the three duration categories presented in section II: (a) <6 months, (b) 6-12 months, (c) >12 months. Having three duration categories we can only compute two outflow rates for each age group, short-term and long-term unemployment outflows rates[9]. As was shown in chapter 1 the overall outflow rate is a linear combination of the duration specific outflow rates. This result is easily extended to age-by-duration specific outflow rates.

For each age group short-term and long-term unemployment outflow rates are shown in Figure 2.12. They enable us to trace through the dynamics of unemployment during the eighties. With rising inflows into unemployment which were continously substantially larger than outflows until the middle of 1985 (cf. Figure 2.2) short-term unemployment outflow rates fell for all age groups, but in particular for middle aged persons (the group with the largest unemployment incidence) until October 1986. With rising inflows this fall in short-term outflow rates must mean a build-up of long-term unemployment[10]. With this build-up the long-term unemployment outflow rates more and more dominate the overall outflow rate. As these long-term rates are so much lower than the short-term outflow rates, they pull down the overall outflow rate. For the young and older unemployed the long-term unemployment outflow rates have seemingly negligible downward trends until October 1986 and remain stationary thereafter while for the middle aged group there is a slight upward trend. The main source (apart from the secular rise of inflows) for the dynamic behaviour of the stock of unemployment must be the movements of the short-term unemployment outflow rates as they determine the duration distribution of the pool of the unemployed over time. With short-term rates rising, assuming constancy of long-term rates, the duration structure will shift (possibly very slowly) back in favour of short-term unemployment, thus giving more weight to short-term rates. The resulting rise in the overall outflow rate, with rising inflows, will slow down the rise in unemployment. If the rise in the overall outflow rate is strong, as was the case in Ireland after 1986, the rise in unemployment might be halted or reversed (cf. Figures 2.1, 2.2 and 2.11).

Results of estimation:

Table 2.2 shows the fit of our model as formulated in (2.6) without the ES. The coefficients on the vacancy/unemployment ratios for the respective age-by-duration group have the right sign and are with one exception well defined. The time trend is only well defined for three groups; in two cases it is positive and once negative. Inspection of Figure 2.12 leads us to think that this is an acceptable result, although modelling the time trend with a simple linear time dummy might be questionable[11]. As mentioned above, there has been a dramatic change in the duration structure of unemployment for all age groups. The proportion of long-term unemployed within each group has risen substantially. The fact that the coefficients on the index of search effectiveness are always positive and highly significant in four out of six cases means that this shift in the duration structure has had a major impact on the age-by-duration outflow rates. This has led to a fall in the overall outflow rate as seen in Section IV. Hence there is an obvious role for ES to reverse the falling average search effectiveness in all age groups. Table 2.3 gives the direction of the impact which an ES has on age-by-duration outflow rates[12]. ES were introduced to raise the outflow rate of the targeted group, without affecting the outflow rates of non-targeted groups. But, Table 2.3 shows that there have been quite a few positive and negative effects on non-targeted groups. Our methodology cannot pinpoint the exact channels through which these effects occur. We do feel, however, that substitution effects as discussed above must be important. We can also see that most ES have a negative impact on targeted groups. Again, the methodology does not tell us why this had happened, but one important reason could be that if we take the best people from a group and place them on an ES a smaller group is left behind which is less search effective. So our results support other evidence that placement officers have taken the best from each group (cf. NESC, 1985). The methodology in the last two sections can tell us that the ES have not achieved their intended aims, but it cannot tell us why they have failed to do so. In the next section to encourage debate we give reasons why we think that the ES were not successful and offer a policy recommendation.

VI Overall Assessment of Employment Schemes

WEP. The NESC report (1985) felt that WEP was not targeting the truly disadvantaged. The OECD has stated frequently if schemes place participants who are especially attractive to employers, this gives rise to the probability of significant dead weight loss and substitution effects. There is indirect evidence in Table 2.3 that WEP took the best from the young STU, thus lowering the average search effectiveness of the group and consequently its outflow rate, while with the young long-term unemployed the programme does not seem to have done this. We have also indirect evidence that as a consequence of creaming off the best of the young short-term unemployed there are substitution effects which have lowered the outflow rates of the middle-aged and older STU. WEP was terminated in 1988, but if the selection criteria applied by placement officers had picked out the truly disadvantaged first-time job seekers, distortive effects would have been less; the search effectiveness of the targeted age-by-duration group would have been higher, and, apart from being more equitable, the reintegration of the disadvantaged group would help in the prevention of hysteresis.

EIS. In its present form it is causing substantial negative effects. The negative effects on all age groups of the STU may indicate two things: substitution effects and that the programme creamed off the best of each group. The lack of impact of EIS on all age groups of the long-term unemployed points to the failure of special premia to boost the outflow rates of the long-term unemployed. This is not surprising considering that participation of this group has never exceeded 17 per cent of those on the scheme. In Section III we argued that long-term unemployment was not a good enough definition of a disadvantaged group outside the labour force. If EIS could target the truly disadvantaged among the long-term unemployed, this would lead to considerably less dead weight loss and substitution effects. In Sweden special wage subsidies are targeted at the long-term unemployed. Within long-term unemployment they distinguish between two groups and work with the principle that the more disadvantaged group must receive a higher subsidy for a longer period to ensure employers' participation in the scheme. If EIS is to entice employers to take on the truly disadvantaged group the special premium must be fixed for a much longer period than at present. A reformed EIS which targets the truly disadvantaged group among the long-term unemployed could be a very beneficial programme. Apart from reducing distortions the reintegration of the disadvantaged group will prevent hysteresis in the longer-term. Also, given the lack of vacancies it is better to have an EIS that targets a smaller group without distortions, since it creates additional jobs, than to abolish this scheme of wage subsidies.

EAS. Both EIS and EAS can cause serious displacement of output and hence employment effects so, as we have already mentioned , one should look at the impact which these schemes have on inflows. EAS does not seem to be significant at all. This could hint at dead weight loss, considering the nature of the scheme. It is worth noting that the requirements to participate in EAS are quite stringent, and yet 40 per cent of EAS participants are defined as long-term unemployed. This again indicates that long-term unemployment is too broad a definition of a disadvantaged group.

TWK and SES. TWK and SES have negative effects on their respective targeted group, possibly reflecting the fact that TWK is taking the best of the young and SES the best of the older long-term unemployed. It is not clear that these schemes will reintegrate anybody into the labour force, so maybe they should include an element of training and give some worthwhile job experience. Again it is more equitable when the schemes target the truly disadvantaged group among the long-term unemployed.

VII Conclusions

The changing duration structure has been an extremely important factor in determining the overall outflow rate and the age-by-duration outflow rates. So, manpower policy could have played a vital role in increasing the overall average search effectiveness of the unemployment stock and hence outflow rates. Yet, our results show that the presence of the ES has had a negative impact on the overall outflow rate due to the many distortive effects on the age-by-duration outflow rates.

We strongly believe that more refined selection criteria should be developed for the ES so that the truly disadavantaged group is targeted. This will minimise distortive effects, increase the average search effectiveness of the targeted age-by-duration group and apart from being more equitable the reintegration of the truly disadvantaged group will help in the prevention of hysteresis.

Footnotes

* This chapter is a revised version of an article co-written with Patrick Walsh which appeared as Lehmann and Walsh (1990).

1. In this section we define short-term unemployment in a somewhat unusual way while long-term unemployment has the normal definition. Below, when we discuss age-by-duration outflow rates, data limitations only allow us to calculate two duration categories of outflow rates from unemployment: short-term unemployment outflow rates (the average probability of flowing out of unemployment within the next 6 months after an uninterrupted unemployment spell of less than 6 months) and long-term unemployment outflow rates (the average probability of flowing out of unemployment within the next 6 months after an uninterrupted unemployment spell of more than 6 months). When analyzing the stocks of unemployment we have three duration categories with the 6-12-months category termed medium-term unemployment (a category not very important compared with the other two). What in our opinion dominates long-term unemployment outflow rates is the > 12-months category of unemployment.

2. The fact that age is not a "selection criterion" for unemployment in the eighties can point to an economy in deep and perpetual recession where unemployment incidence is not confined to specific age groups.

3. This age structure of long-term unemployment is roughly representative for all those OECD countries where long-term unemployment has been a problem in the eighties (cf. OECD, 1988, pp. 14-22).

4. In section IV the relationship between age-by-duration outflow rates and the stock of unemployment will be discussed.

5. In the literature dealing with the evaluation of labour market policies this is often referred to as "creaming" off the stock of long-term unemployment (cf. e.g. OECD, 1988, p.51).

6. Half the expenditures on employment schemes come from the European Community Social Fund.

7. The approach employed by Layard et al. (1991), ch.5, was used here. We took the stock of those unemployed for less than one month at a specific point in time as a proxy for monthly inflows and then estimated quarterly inflows from these flows. For the period where we have monthly inflows (1983 to 1989) we simulated quarterly inflows using the above mentioned proxy and compared them to actual inflows. The comparison allowed us to calculate an adjustment factor with which we multiplied the estimated quarterly inflows for the period 1980(1) to 1989(4).

8. Employment schemes with a training component can lead to a level of human capital larger than the before the incidence of unemployment.

9. For the definition of these rates compare footnote 1.

10. An elegant exposition between outflow rates and duration specific stocks can be found in Haskell and Jackman (1988).

11. Experimentation with other specifications of the time trend were even less satisfactory. Given the short time series and the very strong seasonality using a fixed seasonal dummy might not smooth the data enough.

12. The results of 5 seperate SURE regressions are shown in the appendix. To exclude endogeneity problems, an optimal strategy in these regressions would have been to instrument the individual employment schemes. However, in the Irish case there are no sensible instruments available on a semi-annual basis. A second best is here to "normalize" the participation levels by the targeted stock of the unemployed thus getting close to exogeneous regressors.

Table 2.1
Details of the Employment Schemes Analysed

A. Name	B. Targeted Group	C. Description of Scheme	D. Aim of Scheme	E. Time Analysed
WEP	Under 25 first time disadvantaged job seekers.	Participants spend 26 weeks in employment gaining experience from on-the-job training.	Reintegration of this targeted group into the labour force.	1980(1)-1988(1)
EIS	Persons who have been unemployed for at least 13 weeks.	It gives an employment subsidy for 24 weeks to employers who recruit additional unemployed workers. The subsidy is doubled if you are over 25 and LTU.	Job creation for unemployed workers. Since 1984 a special incentive of a double subsidy was introduced to create jobs for LTU.	1980(1)-1989(4)
EAS	Persons who have been unemployed for at least 13 weeks.	A weekly allowance is paid for a maximum of 1 year to aid the unemployed in setting up in self-employment.	Job creation in the form of self-employment for unemployed job seekers.	1984(1)-1989(4)
TWK	Persons between the ages of 17-25 and unemployed for at least 6 months.	The scheme helps local communities provide temporary work for young persons.	Reintegration of this targeted group into the labour force.	1983(1)-1989(4)
SES	Persons over 25 and unemployed at least a year.	Provides public sector and voluntary work for an average of 2.5 days per week up to 1 year.	Part-time employment for the LTU with an aim to reintegration.	1985(2)-1989(4)

Table 2.2

S.U.R.E. REGRESSIONS ON $\Delta\ln\left(\frac{A}{U}\right)^{aj}_{di}$ WITHOUT EMPLOYMENT MEASURES*

AGE	$\ln\alpha^{aj}_{di}$	$\ln\left(\frac{V}{U^{aj}_{di}}\right)$	$\ln\left(\frac{A}{U}\right)^{aj}_{di,-1}$	TIME	S.E.
			S.T.U		
YOUNG	0.42198 (2.4908)	0.03759 (2.1362)	-1.0599 (5.9408)	0.002127 (0.59873)	0.02467
MIDDLE-AGED	0.49002 (3.8807)	0.077625 (2.1157)	-0.91228 (4.6425)	0.0077042 (1.9646)	0.03342
OLDER	0.77462 (5.9889)	0.045966 (0.90797)	-0.90712 (6.4012)	0.16153 (4.6630)	0.04661
			L.T.U.		
YOUNG	0.69090 (1.6140)	0.19473 (3.5015)	-0.95683 (6.1013)	-0.010683 (0.92966)	0.06582
MIDDLE-AGED	1.0354 (1.5070)	0.43940 (4.2588)	-1.2301 (7.7027)	0.00115 (0.09801)	0.1116
OLDER	2.1160 (4.6693)	0.25923 (3.0621)	-1.1281 (7.8043)	-0.027011 (4.4268)	0.08865

LM-test for serial correlations: 4.61 $X^2(5) = 11.1$. Absolute t-values in brackets.

* Sample Period 80:1 to 89:2 (semi-annual).

Table 2.3
Impact Assessment of Employment Measures

AGE	WEP	EIS	EAS	TEAMWORK	SES
			STU(<6 months)		
YOUNG	-*	-*	NE*	NE	-
MIDDLE-AGED	-	-*	NE*	+	-
OLDER	-	-*	NE*	+	+
			LTU(>6 months)		
YOUNG	+*	NE*	NE*	-*	NE
MIDDLE-AGED	NE	NE*	NE*	-	NE*
OLDER	+	NE*	NE*	NE	-*

NE = no effect, i.e. not significant at 5% level.
* = targeted group.

Table 2.A1

S.U.R.E. REGRESSIONS ON $\Delta \ln \left(\frac{A}{U}\right)^{aj}_{di}$ *; EMPLOYMENT MEASURE: W.E.P.*

AGE	$\ln\alpha^{aj}_{di}$	$\ln\left(\frac{V}{U^{aj}_{di}}\right)$	$\frac{WEP}{UTY}$	$\ln\left(\frac{A}{U}\right)^{aj}_{di,-1}$	*S.E.*
			S.T.U		
YOUNG	0.61930 (4.4065)	0.00979 (0.39660)	-0.76238 (1.7694)	-1.2589 (8.1818)	0.0234
MIDDLE-AGED	0.71544 (7.2625)	-0.024303 (0.060281	-1.9420 (4.2971)	-1.0372 (7.4260)	0.0305
OLDER	0.66224 (5.1998)	-0.42614 (0.69910)	-1.9381 (3.5335)	-0.98815 (6.5923)	0.0561
			L.T.U		
YOUNG	1.1103 (3.2937)	0.32023 (4.3721)	2.8193 (2.5543)	-1.1442 (12.424)	0.0616
MIDDLE-AGED	0.62703 (0.78288)	0.31020 (2.1283)	-0.1229 (0.077386)	-1.0300 (7.9101)	0.1091
OLDER	2.1564 (4.8164)	0.42564 (5.1027)	3.8264 (4.8170)	-1.2026 (9.6559)	0.0806

LM-test for serial correlations: 4.7 $X^2(5) = 11.1$.
Absolute t-values in brackets.

Table 2.A2

S.U.R.E. REGRESSIONS ON $\Delta \ln \left(\frac{A}{U}\right)^{aj}_{di}$ *; EMPLOYMENT MEASURE: E.I.S.*

AGE	$\ln \alpha^{aj}_{di}$	$\ln\left(\frac{V}{U^{aj}_{di}}\right)$	$\frac{EIS}{UT}$	$\ln\left(\frac{A}{U}\right)^{aj}_{di,-1}$	*S.E.*
			S.T.U		
YOUNG	0.38237 (7.2596)	0.050153 (4.755)	-2.5633 (4.5426)	-1.3802 (11.484)	0.0159619
MIDDLE-AGED	0.27994 (3.9915)	0.13504 (4.4169)	-3.0161 (2.7475)	-1.2831 (7.6342)	0.0296706
OLDER	0.16203 (1.2651)	0.10785 (2.1288)	-5.9234 (5.7803)	-1.1539	0.0614174
			L.T.U		
YOUNG	0.30644 (2.0185)	0.15505 (3.2299)	-1.4548 (0.64131)	-0.98050 (8.2374)	0.0648944
MIDDLE-AGED	1.3001 (3.0652)	0.43762 (4.1012)	-5.4648 (1.4802)	-1.1851 (8.4814)	0.108508
OLDER	0.53968 (0.90449)	0.23826 (2.1944)	-1.5420 (0.37867)	-0.98010 (5.4283)	0.104962

LM-test for serial correlations: 5.88 $X^2(5) = 11.1$. Absolute t-values in brackets.

Table 2.A3

S.U.R.E. REGRESSIONS ON $\Delta\ln\left(\frac{A}{U}\right)^{aj}_{di}$ *; EMPLOYMENT MEASURE: E.A.S.*

AGE	$\ln\alpha^{aj}_{di}$	$\ln\left(\frac{V}{U^{aj}_{di}}\right)$	$\frac{EAS}{UT}$	$\ln\left(\frac{A}{U}\right)^{aj}_{di,-1}$	*S.E.*
			S.T.U		
YOUNG	0.34263	0.032513	-0.77803	-1.1064	0.0231722
	(4.1314)	(1.9397)	(0.79274)	(7.3267)	
MIDDLE-AGED	0.28235	0.10201	-0.83058	-1.1152	0.0353287
	(3.0819)	(2.8638)	(0.53988)	(6.7066)	
OLDER	0.092843	0.015847	-3.8953	-0.91278	0.0646619
	(0.48996)	(0.22120)	(1.1547)	(4.9497)	
			L.T.U.		
YOUNG	0.33508	0.14342	-2.5601	-1.0626	0.0658644
	(2.1391)	(2.8789)	(0.90713)	(9.1910)	
MIDDLE-AGED	1.3580	0.37192	-7.0436	-1.1685	0.110385
	(3.0418)	(3.2981)	(1.5055)	(7.6444)	
OLDER	0.61292	0.21641	-2.1099	-0.96271	0.105254
	(0.96159)	(1.9015)	(0.40586)	(5.2028)	

LM-test for serial correlations: 6.41 $X^2(5) = 11.1$.
Absolute t-values in brackets.

Table 2.A4

S.U.R.E. REGRESSIONS ON $\Delta\ln\left(\frac{A}{U}\right)^{aj}_{di}$ *; EMPLOYMENT MEASURE: TEAMWORK*

AGE	$\ln\alpha^{aj}_{di}$	$\ln\left(\frac{V}{U^{aj}_{di}}\right)$	$\frac{TMWK}{UTY}$	$\ln\left(\frac{A}{U}\right)^{aj}_{di,-1}$	*S.E.*
			S.T.U		
YOUNG	0.48766	0.044104	1.077	-1.2383	0.0233902
	(5.5328)	(2.6272)	(1.3568)	(8.0025)	
MIDDLE-AGED	0.40650	0.12009	2.0163	-1.1157	0.0338338
	(4.5062)	(3.4857)	(1.7052)	(6.8305)	
OLDER	0.50036	0.095406	4.1307	-0.96271	0.0614932
	(3.0725)	(1.2927)	(1.8395)	(5.4186)	
			L.T.U.		
YOUNG	0.46259	0.12944	-5.5875	-1.0048	0.055577
	(3.4946)	(3.1177)	(3.0011)	(10.520)	
MIDDLE-AGED	1.4954	0.36354	-7.9913	-1.1225	0.1054
	(3.3309)	(3.3120)	(2.1575)	(6.9941)	
OLDER	0.80802	0.20634	-4.0076	-1.0020	0.1045
	(1.5265)	(1.8612)	(1.0964)	(5.5930)	

LM-test for serial correlations: 5.25 $X^2(3) = 11.1$.
Absolute t-values in brackets.

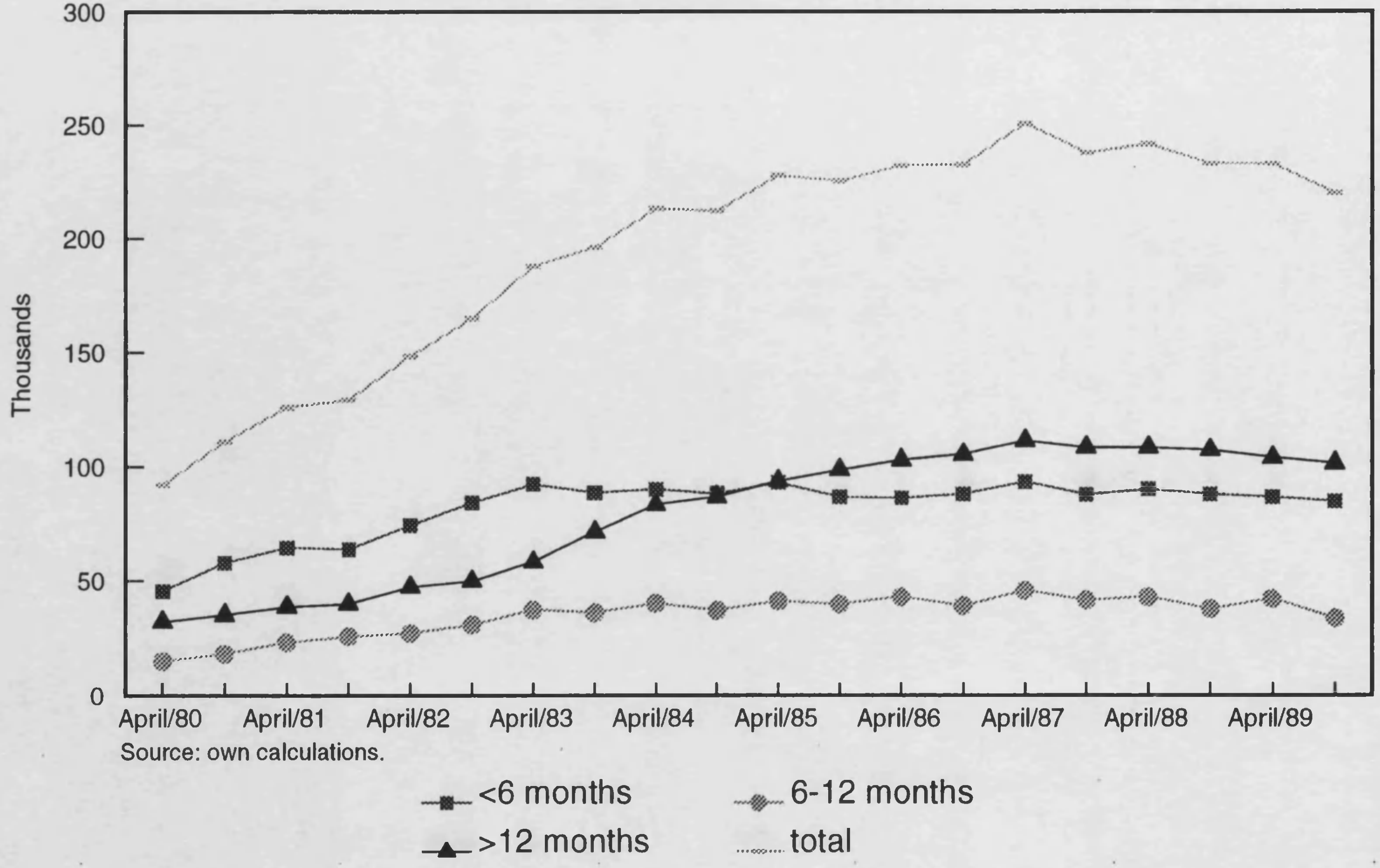
Table 2.A5

S.U.R.E. REGRESSIONS ON $\Delta \ln \left(\frac{A}{U}\right)^{aj}_{di}$; EMPLOYMENT MEASURE: S.E.S.

AGE	$\ln\alpha^{aj}_{di}$	$\ln\left(\frac{V}{U^{aj}_{di}}\right)$	$\frac{SES}{UT}$	$\ln\left(\frac{A}{U}\right)^{aj}_{di,-1}$	S.E.
			S.T.U		
YOUNG	0.22171	0.07177	-1.2606	-1.3543	0.0178178
	(2.6070)	(4.6887)	(2.9752)	(8.5541)	
MIDDLE-AGED	0.15646	0.19761	-1.8689	-1.5301	0.0303319
	(1.5773)	(4.3817)	(2.3868)	(6.8344)	
OLDER	0.45143	-0.016325	1.8598	-0.69953	0.0581404
	(3.2155)	(0.24836)	(2.1213)	(3.9996)	
			L.T.U.		
YOUNG	0.27883	0.166447	0.14282	-1.0772	0.067023
	(1.0427)	(2.8732)	(0.10617)	(8.0450)	
MIDDLE-AGED	1.2915	0.444185	-0.79516	-1.1524	0.113537
	(2.0073)	(3.6642)	(0.41530)	(6.9660)	
OLDER	1.7324	0.32346	-3.8870	-0.95605	0.0942276
	(3.0633)	(3.3702)	(2.9329)	(5.7398)	

LM-test for serial correlations: 4.94 $X^2(5) = 11.1$.
Absolute t-values in brackets.

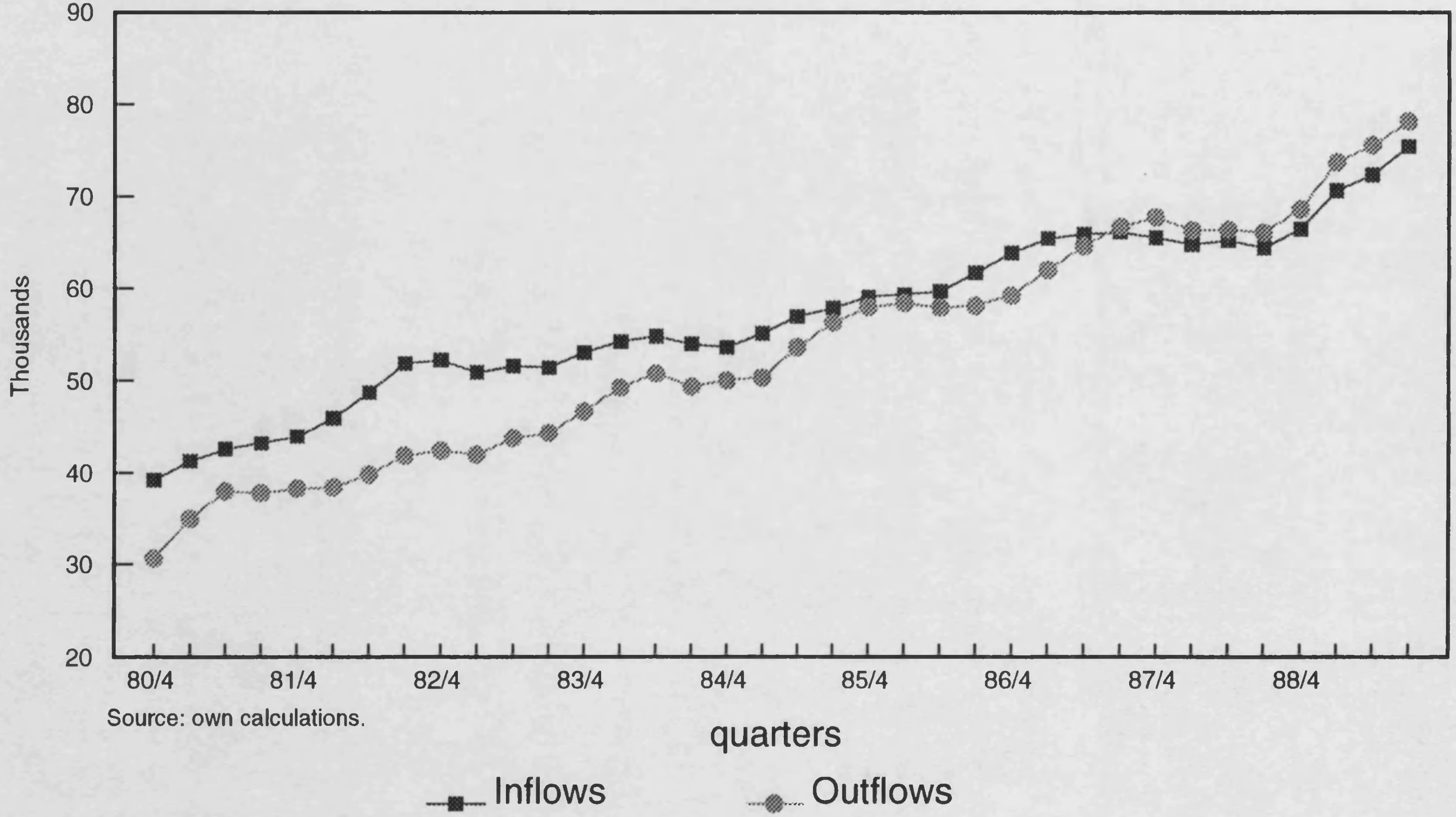
Figure 2.1 - Total unemployment and unemployment by duration
Semi-annual data for Irish labour market (men and women) : April 80 - Oct 89



Source: own calculations.

Figure 2.2 - Inflows into and outflows from unemployment

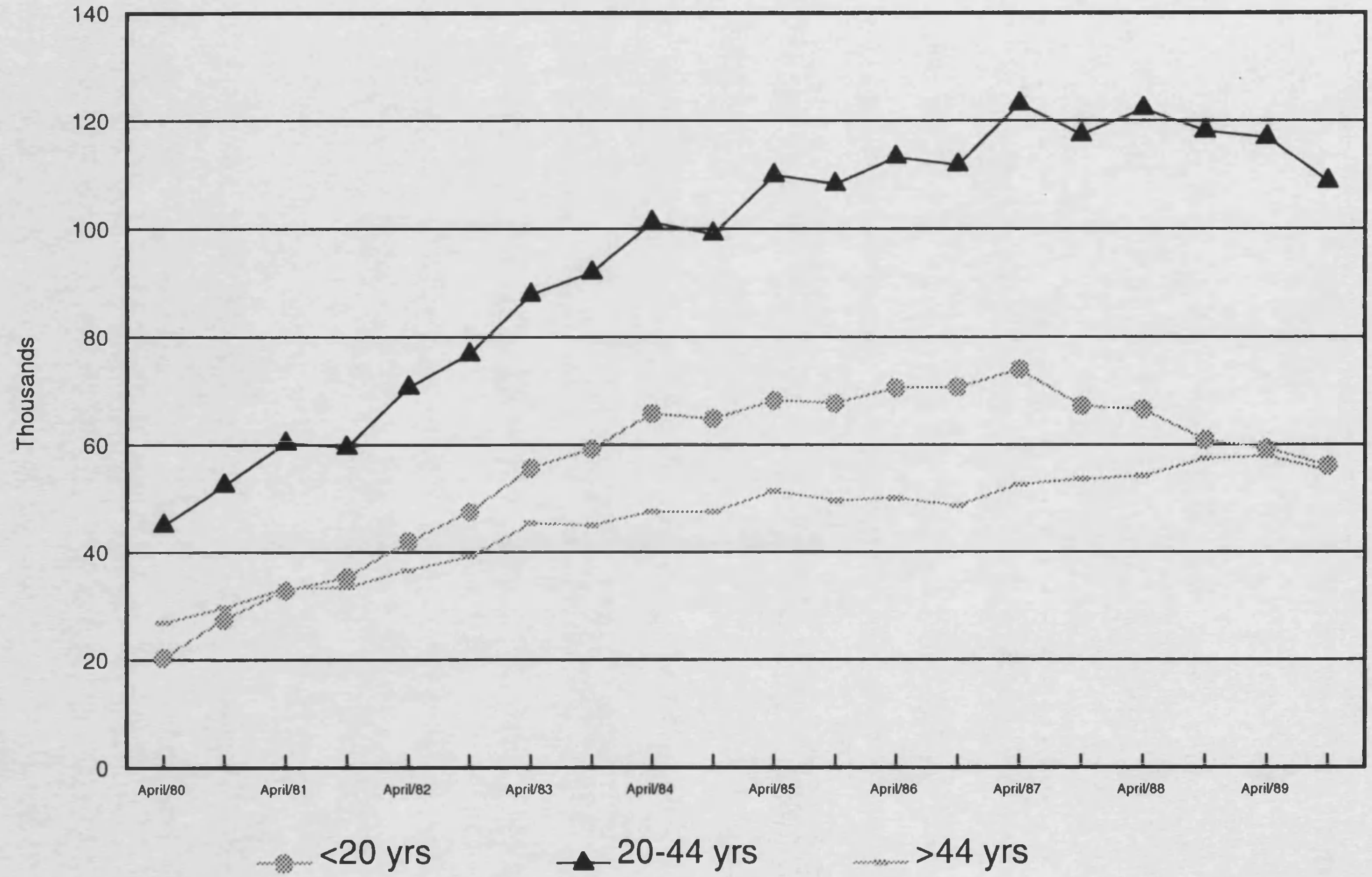
The Irish labour market: 1980(4)-1989(3)-men and women



Source: own calculations.

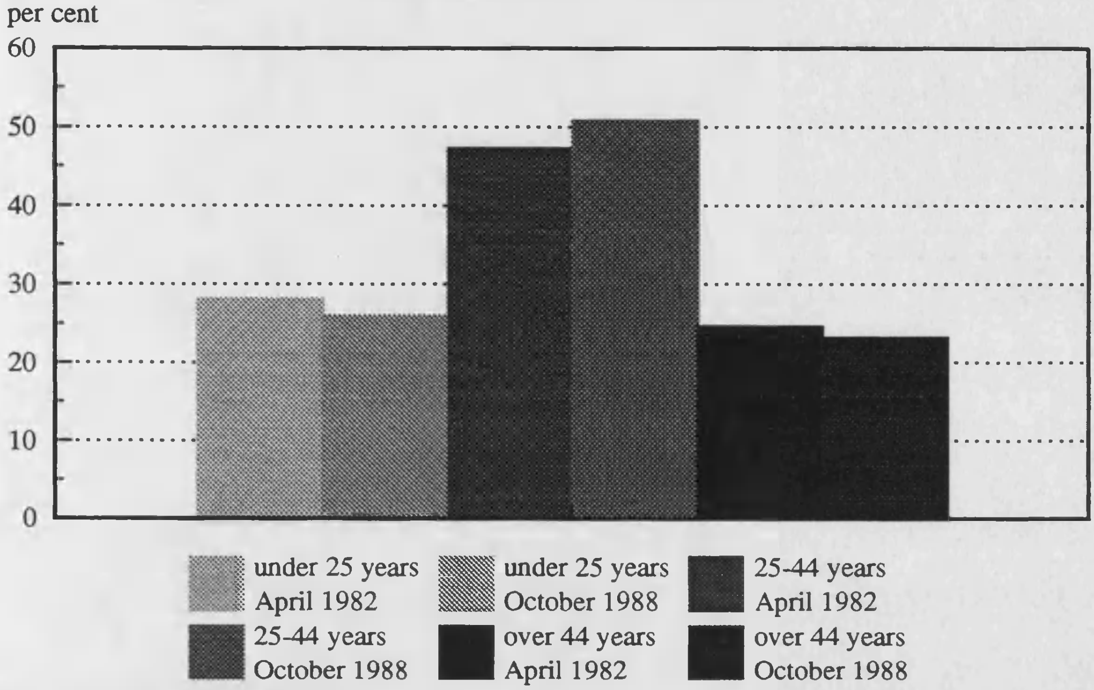
Data are moving averages; at t the average of t-2,t-1,t and t+1 is shown.

Figure 2.3 - Unemployment by age in Irish labour market
Semi-annual data : April 1980 - October 1989



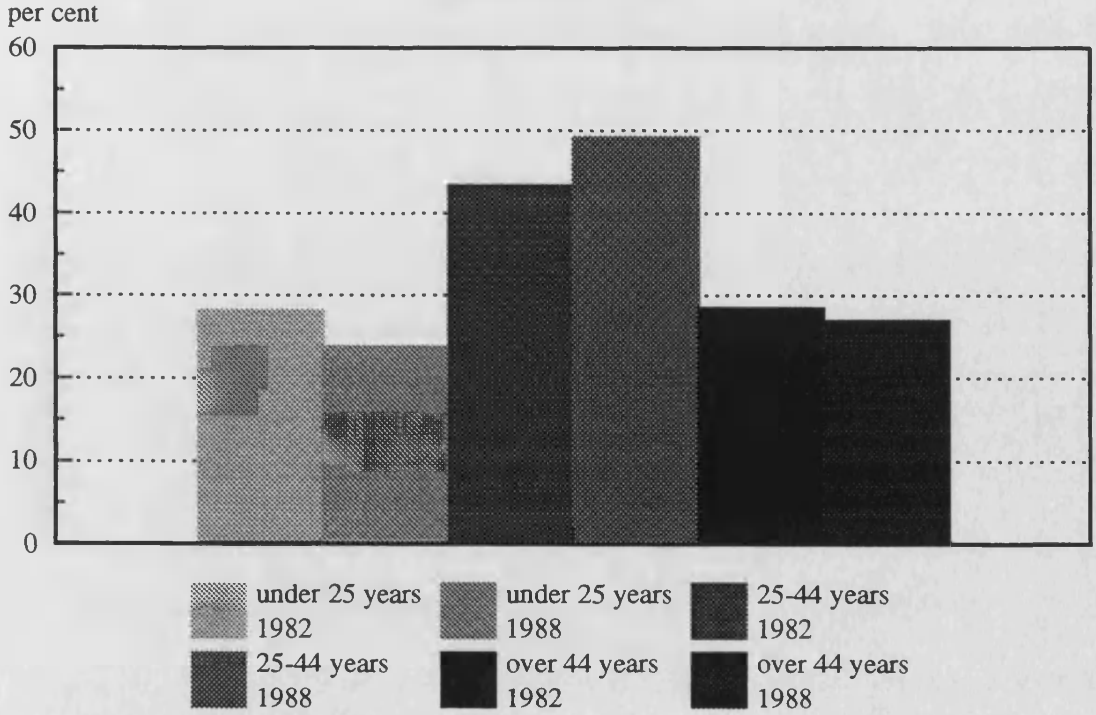
Source: own calculations.

Figure 2.4 - Percentages of Live Register by age
Ireland: April 1982 - October 1988



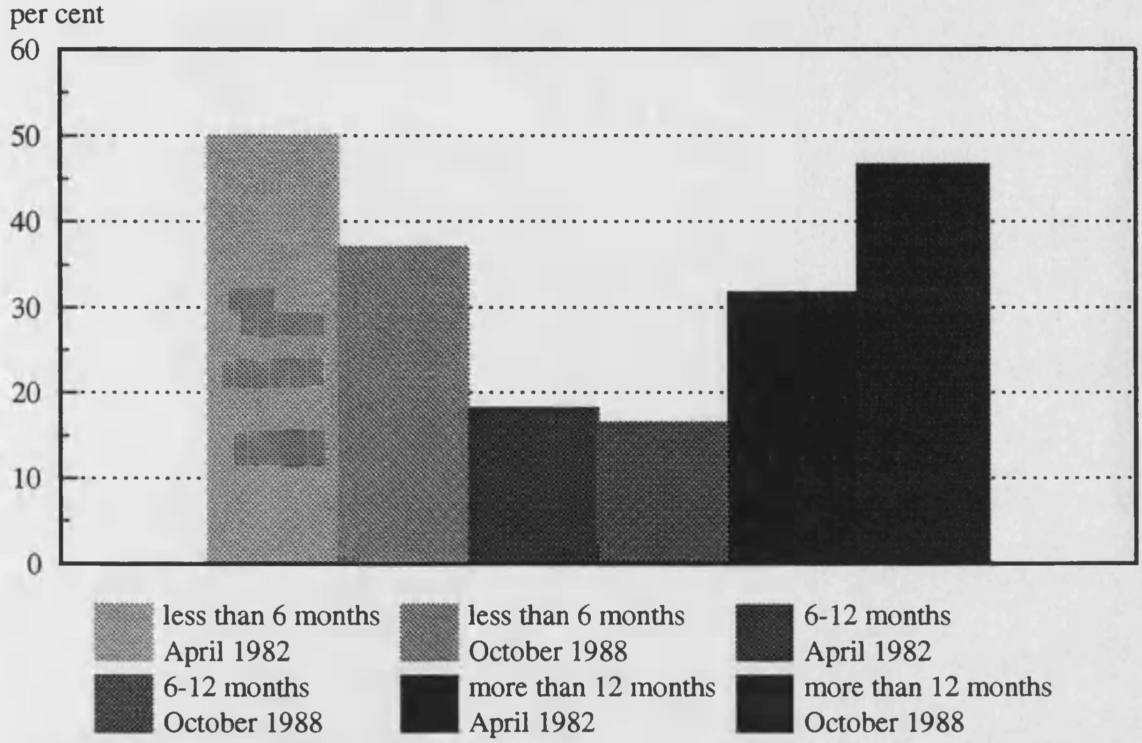
Source: Irish Central Statistical Office (1991)
Note: Data are not disaggregated by sex.

Figure 2.5 - Percentages of Labour Force by age
Ireland: 1982 - 1988



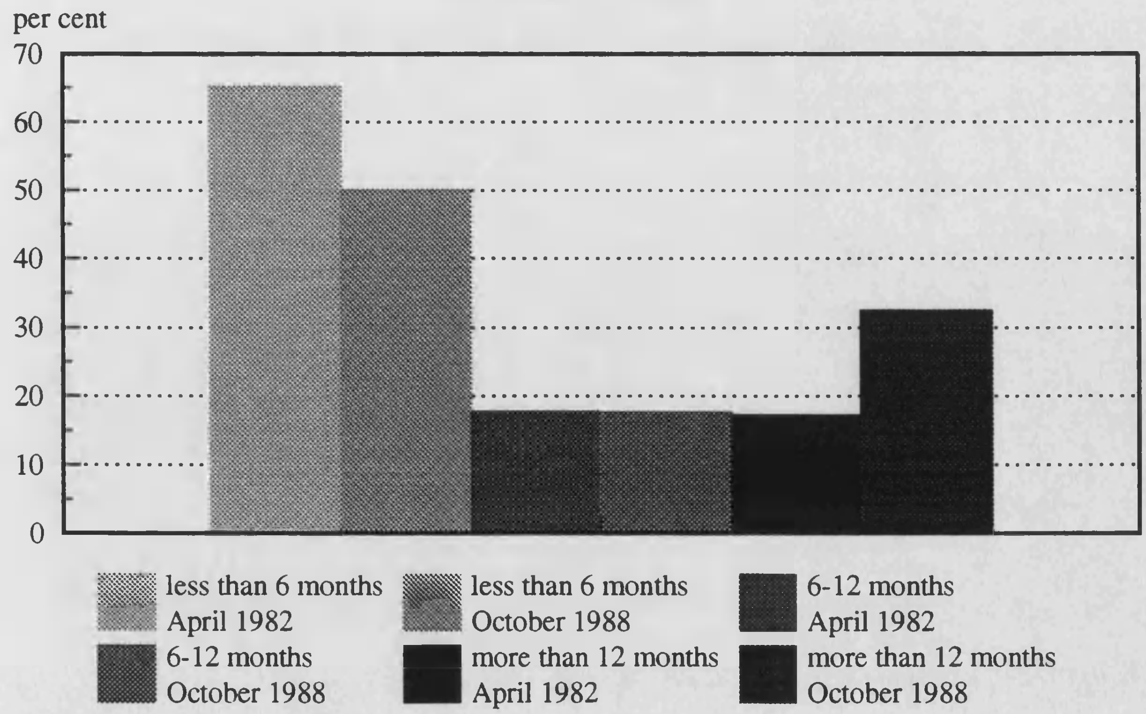
Source: Irish Central Statistical Office (1991)

Figure 2.6 - Percentages of Live Register by duration
Ireland: April 1982 - October 1988



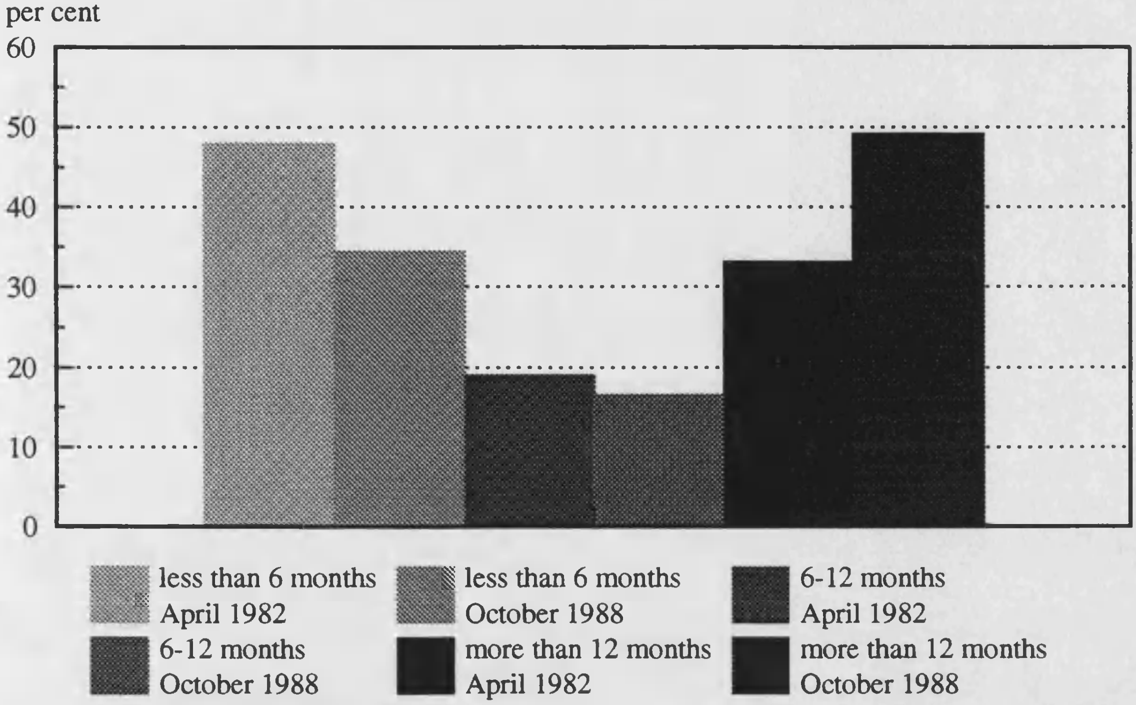
Source: Irish Central Statistical Office (1991)

Figure 2.7 - Percentages of Live Register by duration
Ireland: April 1982 - October 1988
Age group: <25 years



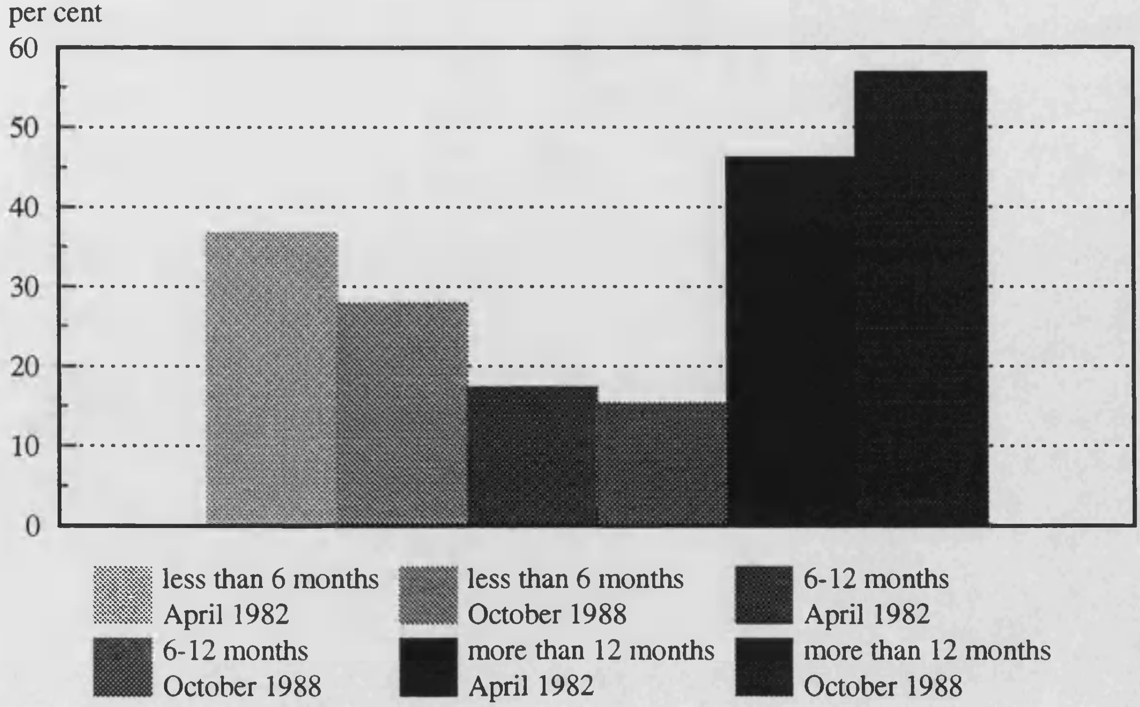
Source: Irish Central Statistical Office (1991)

Figure 2.8 - Percentages of Live Register by duration
Ireland: April 1982 - October 1988
Age group:25-44 years



Source: Irish Central Statistical Office (1991)

Figure 2.9 - Percentages of Live Register by duration
Ireland: April 1982 - October 1988
Age group:>44 years



Source: Irish Central Statistical Office (1991)

Figure 2.10a - ES participation levels (men & women)
The Irish labour market: 1980(1) to 1989(4)

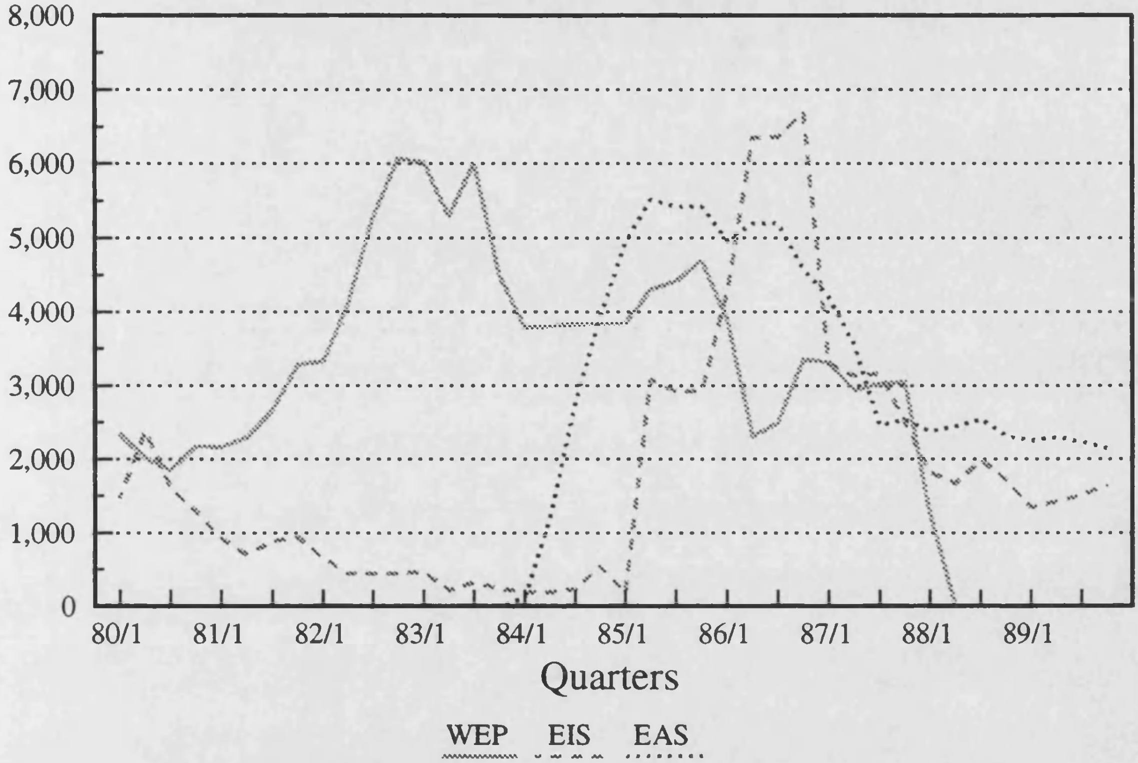


Figure 2.10b - ES participation levels (men & women)
The Irish labour market: 1980(1) to 1989(4)

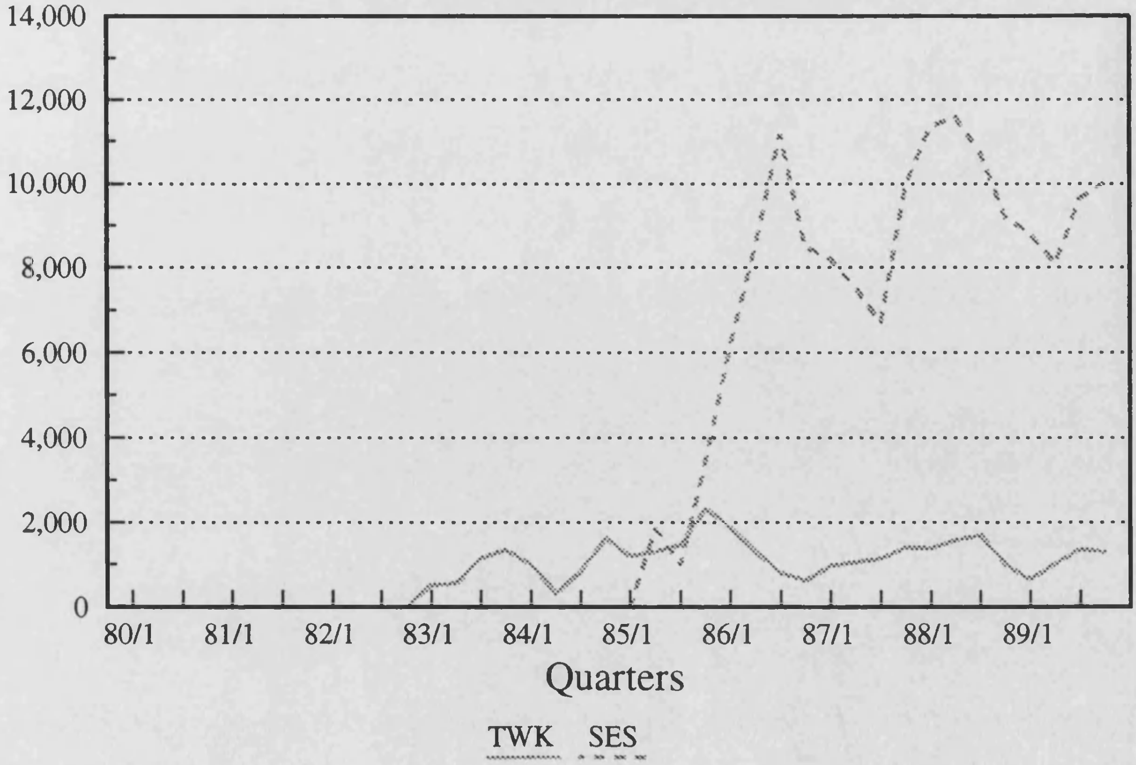
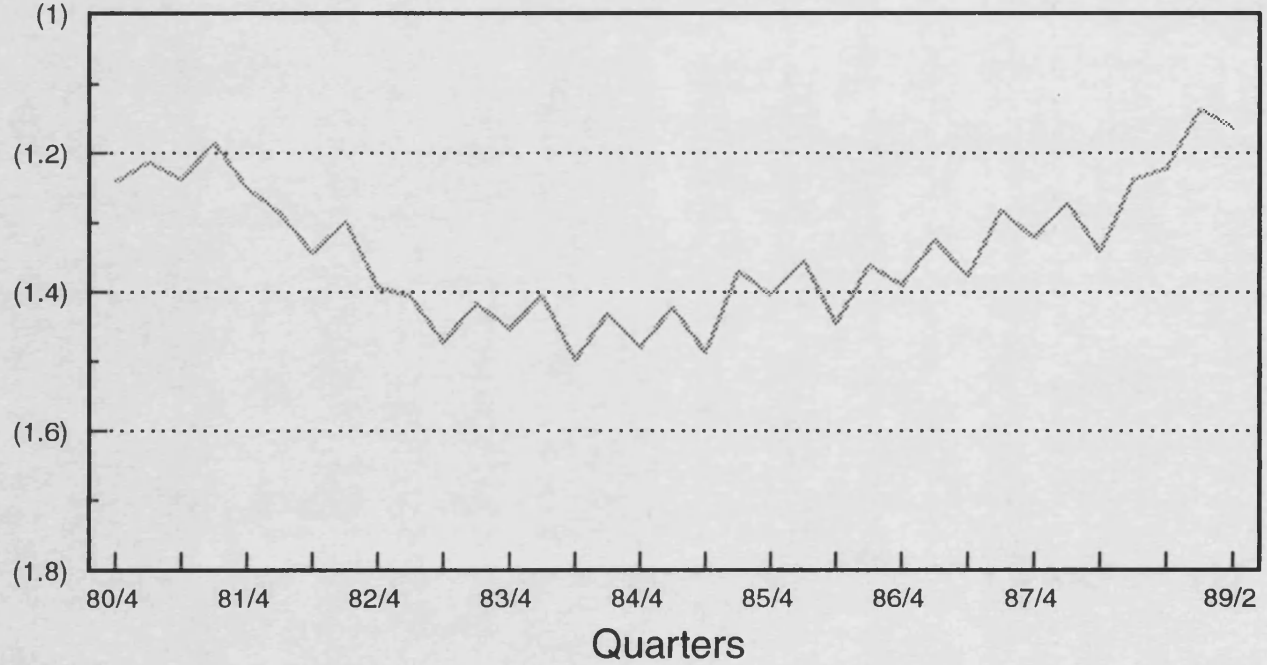
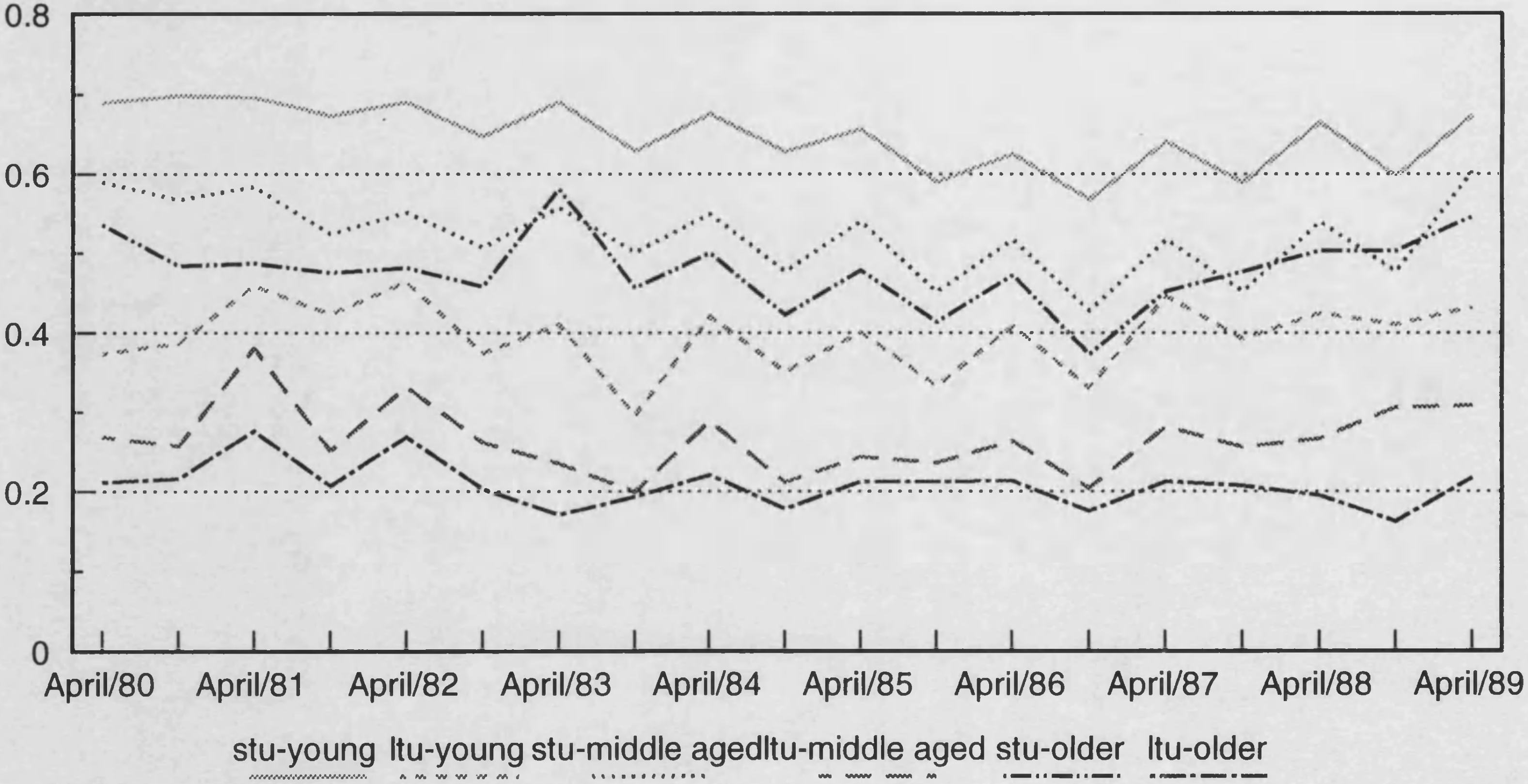


Figure2.11 - Moving Average of the Log of Overall Outflow Rate from Unemployment Ireland:1980(4) - 1989(2)



Average taken at t-2,t-1,t,t+1.
Numbers in parentheses imply negative values.

Figure 2.12- Semi-annual age-by-duration outflow rates from unemployment (men and women) Ireland: April 1980 - April 1989



stu-unemployment<6months;ltu-unemp.>6months
young-<25yrs;middle aged-26-44yrs;older->44yrs

Chapter 3

Productivity, Employment and Labour Demand in Polish Industry in the 1980s: Some Preliminary Results from Enterprise-Level Data*

I Introduction

The Polish economy of the 1980s can be characterized as a partially-decentralized socialist economy (SE). The reform of 1982 established enterprises as nominally independent and self-financing entities, but in fact formal and informal central guidance of enterprises continued. The 1982 reform was also supposed to establish market-clearing prices, but markets continued to be characterized by disequilibrium and persistent shortage throughout the 1980s. During this period price controls were widespread; though the scope of these controls gradually declined, even at the end of the period (just before the major price liberalization that started in mid-1989) about 70% of all market transactions took place at state-controlled prices.

In this chapter we investigate the nature of one market in particular - the market for labour. It is often argued, in simple neoclassical fashion, that in Poland during this period, as in socialist economies generally, wages were set (directly or informally) by the center below the levels that would clear the labour market, and that the result was excess demand by enterprises for labour. A number of alternative views of the market for labour in socialist economies have also been put forward. One of the more prominent views may be termed the "chronic shortage economy" view; its best-known proponent is Kornai (e.g. Kornai (1980)). In this view the demand for labour by enterprises is insensitive to the wage; excess demand for labour would appear at any wage.

We use a panel data set consisting of annual data from approximately 350 Polish industrial enterprises over the period 1983-88 to try to test empirically a simple neoclassical approach to the socialist labour market. We describe here our initial investigations; the results reported are preliminary at best and can only be taken as suggestive of how the Polish labour market operated in the 1980s and of the directions further research should take. Our approach is as follows. First, we estimate directly an enterprise production function, allowing for firm-specific fixed effects. The resulting estimated marginal products of labour are then compared to the wage paid by enterprises. Our results indicate that for most enterprises, the MPL exceeds the wage by a considerable margin. The second step in our investigation is to look at the rate of change of employment in the majority of enterprises for which the MPL exceeds the wage and in that small but still substantial minority of enterprises for which the wage exceeds the MPL. One implication of the simple neoclassical approach is that the latter group of enterprises should try to shed labour. It turns out nearly half of these enterprises actually increased their employment. Put another way, the simple neoclassical explanation of labour shortage in socialist economies fails not because wages are low relative to the marginal products of labour--they are--but because the labour demanded by socialist firms does not appear to be consistent with profit maximization.

The organization of the chapter is as follows. We begin with a discussion in Section II of labour markets and wages in socialist economies in general and in Poland in particular. Section III describes the model to be estimated, the econometric problems involved, and the data used. In Section IV we present our results, and Section V concludes.

II Labour Markets and Wages in Socialist Economies (SEs)

In SEs policy makers were influenced in their employment and wage setting policies by the basic Marxist tenets that labour is the sole creator of wealth and should therefore not be treated as a commodity and that income equalization is the center piece of social policy. This led to wage setting through administrative channels, direct and indirect employment regulation, and the planned supply of human resources. The main features of employment and wage structure in SEs are the following:

1. SEs operate at full employment, and open unemployment is nearly non-existent. Dismissal of workers for bad performance is extremely difficult (though dismissal for political transgressions is not uncommon).

2. Wage regulations are an important tool for achieving distributive targets. One result of the commitment to a fairly equal distribution of income has been a highly compressed within-firm wage structure.

3. Wages are a smaller part of workers' income than in Western countries, e.g. in the years 1983-88 in Poland on average more than one third of workers' remuneration was non-wage income. Wages also do not give an accurate picture of income differentials, as entitlement to consumer goods which are in short supply vary dramatically across firms and industries. Furthermore, they do not reflect true labour cost as shown in a stylized table of labour costs in Polish industry for the year 1986 (See Table 3.1).

4. Apart from some very basic benefits like health care and education many social benefits are explicitly tied to the job which a worker holds. This is in stark contrast to the Western work environment where relatively efficient and competitive labour markets are supplemented by a general safety net for those who are least endowed and skilled.

5. The industrialization drive undertaken by all socialist regimes had to keep consumption low to achieve high investment rates. Since for a long time the development of heavy, capital intensive industry was emphasized the tendency to depress consumption levels was further strengthened. On the firm level high investment rates meant that the wage bill had to be kept as small as possible. The macro and micro implications of the industrialization drive resulted in an administered real wage below the market clearing wage.

Labour supply changes in the 1970s and the 1980s in Poland.

We are primarily concerned in this chapter with enterprises' demand for labour. A few words here are in order, though, on labour supply in Poland in the period under consideration.

Let us write labour supply as

$$L^s = L^s(w;z)$$

where w is the real wage and z is a vector of shift variables. To z belong variables which relate to social policy, the legal environment and activities in the black (grey) economy and in the private sector. Throughout most of the 1970s and 1980s changes in *z* caused a decrease in the supply of labour (World Bank, 1987, pp. 150f and Krajewski and Smusz, chapter 8).

First of all, a shift in social policy in the 1980s caused a fall in the participation rates of men and women. The government increased old age pensions and changed retirement policies allowing, for example, women to retire at 55 if they had worked for 30 years. The aftermath of the imposition of martial law saw further provisions to encourage retirement in general. Also in the 1980s unrecorded activities in grey/black markets increased substantially. The government was aware of falling participation rates and tried to counteract these with "antiparasitism" laws and with tax incentives to lure retirees back into the labour force. These counteractive measures were clearly not successful as the participation rate for males fell from 1.09 in 1960 to 0.89 in 1985, while the rate for females fell from 0.79 in 1970 to 0.66 in 1985. A further ingredient determining the decline in labour supply in the socialized sector of the economy was the fall in hours worked due to the introduction of free Saturdays and the rise of incidents of absenteeism (only the two years following the imposition of martial law saw a temporary reversal of this trend). Finally, through the 1980s the labour-intensive private sector grew rapidly.

The neoclassical demand for and supply of labour.

In the basic static neoclassical theory of the firm under certainty, the demand for labour is given by the first order condition of the maximization of profits: taking labour costs as given, the amount of labour demanded is where the marginal product of labour would equal labour costs (the net wage plus social security contributions and so on). The supply of labour is derived from the individual's utility maximization problem. Given the above outlined characteristics of employment and wage setting one might pose the question whether it is sensible to discuss employment and wages within a neoclassical framework of a labour market where we have supply of and demand for labour.

This approach can be defended in two ways. First, there exists some empirical evidence that labour markets function partially in SEs:

1. We have labour turnover on similar levels as in Western countries.

2. Labour force participation rates are high. Taking the unit of analysis as the household, this can be explained as a consequence of low real wage setting (a single income is typically not enough to support a family), the absence of unemployment benefits and the tying of social safety net provisions to the workplace.

3. People are not allocated specific jobs, but rather choose them freely. Even in the Soviet Union we observe "the low [proportion] of job vacancies that are filled through any form of planned hirings" (Granick, 1987, p. 12). The standard neoclassical utility-maximization approach to labour supply is therefore not unreasonable.

Second, a simple neoclassical approach can be directly defended as providing a reasonable theoretical framework for the analysis of employment and labour demand in Poland in the 1980s.

The assumption of profit maximization is not obviously correct, to put it mildly. Still, as Goldfeld and Quandt (1988, 1990) argue in their papers modelling the socialist firm, it is a sensible starting point for the analysis. Beginning in 1982 Poland implemented a major enterprise reform that was supposed to transform state-owned enterprises into independent, self-financing and profit-maximizing firms.[1] Furthermore, if the neoclassical approach has empirical implications that are contradicted by the data, we have some evidence for questioning its assumptions. If our investigation shows that Polish enterprises did not in fact choose or adjust their employment levels in ways consistent with a neoclassical profit maximization model, we have shown something substantive about the micro behaviour of socialist enterprises.

The "bailout" or "soft budget constraint" problem should be mentioned here. The soft budget constraint, it is often argued, has the effect of increasing factor demand; the intuitive reason given is that if the state subsidizes labour costs, more labour will be demanded by firms.[2] This simple argument does not work, however, if the soft budget constraint is a subsidy on profits rather than costs, since (in a simple neoclassical model) any monotonic transformation of profits leaves the maximization problem, and thus factor demand, unchanged. Schaffer (1990), using the same dataset of Polish firms as that used in this chapter, provides evidence that indeed subsidies to Polish state-owned enterprises took the form of profit subsidy, with loss-makers being subsidized at a higher rate than profit-makers. Goldfeld and Quandt have modelled the effect of the soft budget constraint on factor demand in a more sophisticated but still neoclassical fashion. They show that, in the presence of uncertainty and allowing for a special labour input used to "whine" for subsidies, factor demand is increased by the presence of a soft budget constraint taking the form of a profit subsidy. We do not, however, apply this analysis in our empirical work, and use instead the simple neoclassical formulation of factor demand.

Finally, a simple neoclassical model where firms take the wage as given and then try to adjust number of workers is not unreasonable for Poland in this period. Wages were heavily influenced by central policy, both formally, through the use of a punitive tax on wage increases in excess of centrally-set limits, and informally. Assuming the wage was centrally set and thus exogenous is not too unrealistic. Under the 1982 enterprise reform, enterprises were supposed to be autonomous; this included employment policy. Legislative restrictions on firing workers would have slowed any downward adjustment of employment, but this could still have been achieved by natural attrition (the annual attrition rate--departures/employment--for industry as a whole in the 1980s was in the range of 15-20%).

Figure 3.1 shows the two regimes which a profit maximizing firm can face in a simple neoclassical world with instantaneous adjustment if the wage is administratively set at a low level w_a. The location of the firm's demand for labour curve will above all depend on technology parameters, the quantities of other inputs, and the price which it can fetch for its product. Most firms in SEs can be thought of having a demand for labour represented by L_1^D. Given a wage w_a profit maximizing firm will try to hire labour up to the point where w_a equals the marginal product of labour. At this wage, however, workers are unwilling to supply this amount of labour, and so we see an employment level of L_1 and excess demand for labour (L_1-L_a). There could be, however, some firms whose labour demand is characterized by L_2^D, so here w_a results in an employment level of L_2 and excess supply of labour (L_a-L_2). With instantaneous adjustment, we would expect to observe most firms operating on the labour supply schedule; they are constrained in the amount of labour they are able to hire. A smaller number of firms, having a relative high administratively set wage, would be operating on the labour demand schedule; here, workers are constrained in the number of jobs they can obtain.

As long as the wage is exogenously set by the center and forced upon both firms and workers, it will only be by sheer coincidence that such a wage will equilibrate the demand for and supply of labour. The difference between the marginal product of labour and the wage implies an inefficiency in the allocation of labour; the larger the difference, the greater the inefficiency.

Excess demand or excess supply are the plausible regimes which firms and workers experience. An administered wage which is substantially lower than the MPL of most firms means most firms are in the excess demand regime; thus we would see excess demand in the labour market and continual shortage of labour. Another possibility is that the wage is set higher than the MPL of most firms. In this case, most firms are in the excess supply regime but seek to maintain and even increase their employment levels because of directives from the center to enterprises. Here shortage of labour is the result simply of these central directives. The third possibility is that the low wage observed in SEs is the result of low productivity and that the wage set by the center, while not exactly the equilibrium wage, is close to it for most firms.

With slow adjustment to changes the situation is somewhat more complicated. Labour employed by enterprises can change slowly because of difficulties in firing workers, training and other adjustment costs, etc. Labour supplied by workers can change slowly because of delays in finding a new job, costs of moving to a new location, etc. Figure 3.2 shows the dynamics we would expect to see with slow adjustment. At w_e long-run equilibrium employment is L_e, where the labour demand and labour supply curves cross. Below w_e at w_1, say, employment will eventually settle down to L_1, on the labour supply curve; to the right of the labour supply curve, firms will lose workers (despite wanting more of them at that wage), and to the left of the labour supply curve firms will gain workers. Above w_e at w_2, say, employment will eventually settle down to L_2, on the labour demand curve; to the right of the labour demand curve, firms will release or not replace workers (despite workers wanting employment at that wage), and to the left of the labour demand curve, firms will hire additional workers.

The direction of labour adjustment predicted by the simple static neoclassical model can, given observed enterprise wages and employment and estimated enterprise marginal products of labour, be examined directly. Assume, for simplicity only, that neither the centrally-set wage nor the labour demand and supply curves are expected by both enterprises and workers to change. For some firms, the centrally-set wage would be below the marginal product of labour. In Figure 3.2, these firms lie to the left of the labour demand curve. If such a firm experiences a decrease in employment, it indicates that the firm is located in quadrant A and therefore the wage it is paying is below the equilibrium wage w_e. If the firm increases its employment, it is located in quadrant B, in which case we cannot immediately say whether the wage it is paying is above or below w_e. For some firms, the centrally-set wage would be above the MPL. From Figure 3.2 we can see that we would expect all such firms experience a decrease in their employment. Note that this will be the case regardless of the location of the labour supply curve. Note also that adding labour adjustment costs (e.g. training costs) to the model would move the labour demand curve to the left and would therefore not affect the predicted labour adjustment behavior of firms whose wage is above their MPL.

The above dynamics can in principle be formalized and estimated directly. We do not undertake this in this chapter, but leave it instead to future work.

A brief discussion of the phenomenon of hidden or disguised unemployment in socialist economies is in order here. We can define hidden unemployment as employment above what would be observed in a competitive economy with profit-maximizing firms (and utility-maximizing workers). The profit of a firm with hidden unemployment does not decrease if its labour force decreases. The situation is analogous to the employment of labour in agriculture in a Lewis-type model. In the literature on socialist economies, hidden unemployment is sometimes called labour hoarding. In the Western economics literature, however, this term usually refers to (long run profit-maximizing) increased employment in the presence of output cycles; extra workers are kept on during a slump to avoid retraining and other costs when output picks up. We will use the latter definition of this term in this chapter. We note here, however, that similar cyclical effects on labour demand may operate in socialist economies. Socialist enterprises typically "storm", meaning that they concentrate their production at the end of the month or year to fulfil their output target. Enterprises could hoard labour during slow months, in anticipation of the rush work at the end of the year, and still have excess demand for labour over the entire year.

In a simple neoclassical framework, excess demand for labour is inconsistent with hidden unemployment. Say a firm in a socialist economy faces a centrally set wage above w_e and is operating at an employment level where this wage exceeds the marginal product of labour. In the static neoclassical model, this means it is operating at a point to the right of its labour demand curve. Also say that this point is on or to the left of the labour supply curve, thus placing the firm in quadrant C in Figure 3.2. If the employment level of the firm does not adjust downwards over time, we observe persistent excess supply of labour. One should interpret this excess supply of labour as hidden unemployment. Excess supply of labour in such a firm persists because the firm cannot or will not shed labour rapidly or refuse employment to new workers. In a socialist economy this would likely be because it is prevented from doing so because the central authorities are committed to full employment. A firm persistently operating to the right of both the labour supply and demand curves (quadrant D) would also be said to have hidden unemployment. This situation is unlikely, however, since it implies that workers are forced to take jobs and are not free to leave them. Note that this means that we are likely to observe this type of hidden unemployment only when the wage is above the equilibrium wage w_e.

To generate simultaneous excess demand for labour and hidden unemployment as the result of some optimization process we need a more sophisticated model. For example, if we have heterogeneous labour and the center administratively sets the average wage we could end up simultaneously with excess demand for labour and hidden unemployment. Suppose we have skilled and unskilled labour and the central authorities impose a ceiling on the average wage that the firm can pay its workers. Also suppose that firms try to increase the motivation of skilled workers by attractive wage rises or, to put it another way, firms try to pay efficiency wages to the skilled part of their work force. As long as the proportion of unskilled workers is not too large it might pay for a profit-maximizing firm to demand more unskilled labour in order to enable it to hire more skilled (high-wage) labour. This could be the case even if the wage paid to unskilled workers exceeds their marginal products. There is some evidence that Hungarian firms followed such a strategy in their hiring decisions after the reforms of 1968.[3] We do not, however, pursue this idea further in this chapter.

As noted in the introduction, an alternative approach to the analysis of the socialist labour market is to take pervasive chronic shortage throughout the economy as the starting point (cf. Hare, 1989). Basically there is excess demand for labour no matter what the wage. Firms react to the resulting shortage of labour by accumulating extra workers which in turn exacerbates the shortage situation. This view sees excess demand for labour and labour shortage as phenomena feeding on each other.

III Modelling Strategy

Our strategy is to specify and estimate a production function, and use the parameter estimates together with enterprise inputs and the enterprise wage to calculate for each firm an estimate of the marginal product of labour. We then compare the MPL for each firm with the cost of labour (the net wage plus wage taxes) for each firm. This (very simplistic) comparison allows us to classify firms into excess demand and excess supply regimes: assuming profit maximization and a well-behaved production function, if, for firm *i*, $MPL_i > w_i$, then firm i has an excess demand for labour, and visa-versa if $MPL_i < w_i$. The last step is to compare the dynamics of labour employed by enterprises in the two regimes. Again assuming profit maximization, and taking the wage as exogenous, ceteris paribus, firms in the excess supply regime should shed labour faster than those in the excess demand regime.

Production function estimation.

In estimating a production function for Polish enterprises in the 1980s, the single biggest problem faced is that of distorted output prices. Large-scale formal and informal state regulation of enterprise output prices means that the total sales of each enterprise are valued at prices which are sector- and even firm-specific. The existing literature on socialist economies unfortunately gives us little guidance on how we might model the price formation process. Nor does the data set we use contain information on the price of output; only total output in current prices is available.

We address this problem in a pragmatic and somewhat ad hoc fashion by using the panel nature of the data set. We postulate that each firm sells its output at a (relative) price specific to that firm. This firm-specific price fluctuates randomly over time around a mean "base price" which does not change over time, and thus can be viewed as "fixed effect" plus an error term. We assume as well that each firm is characterized by a technological level taking the form of a firm-specific multiplicative parameter, assumed constant over time (also a "fixed effect"), and a time-varying multiplicative parameter, assumed constant across firms. We write

$Y_{it} = P_i e^{u1it} A_i e^{u2it} B_t F(L_{it},K_{it},M_{it})$ enterprise i, time t (3.1)

where

Y_{it}	=	gross output
P_i	=	firm-specific "base price", assumed constant over time
u_{1it}	=	white noise random error in the firm's actual price
u_{2it}	=	white noise random error in the firm's output
A	=	other firm-specific attributes (technology, etc.), assumed constant over time
B	=	technical progress parameter, shared by all firms
L	=	labour
K	=	capital
M	=	materials

Writing lower case for logs, we have

$$y_{it} = p_i + a_i + b_t + f(L_{it},K_{it},M_{it}) + u_{1it} + u_{2it} \qquad (3.2)$$

Collapsing the two fixed effects into a single fixed effect α_0 and the two error terms into a single error term $u_{i\,t}$, and writing d_t to represent a vector of time dummies to capture the shared rate of technical progress, we estimate

$$y_{it} = \alpha_0 + f(L_{it},K_{it},M_{it}) + d_t + u_{it} \qquad (3.3)$$

We use as our production function the flexible translog form:

$$\begin{aligned} f(L_{it},K_{it},M_{it}) &= \alpha_1 l_{it} + \alpha_2 k_{it} + \alpha_3 m_{it} \\ &+ \alpha_4 (l_{it})^2 + \alpha_5 (k_{it})^2 + \alpha_6 (m_{it})^2 \\ &+ \alpha_7 l_{it} k_{it} + \alpha_8 l_{it} m_{it} + \alpha_9 k_{it} m_{it} \end{aligned}$$

where again lower case letters denote logs.

Direct estimation of a production function using ordinary least squares (OLS) is typically subject to simultaneous equations bias; because the level of output is chosen simultaneously with the level of inputs used, the inputs will typically be correlated with the error term in the production function equation. In an economy characterized by shortage and excess demand for inputs, however, this is not a problem, since we can take the observed levels of inputs as exogenously given by some rationing process. The situation is not so simple here, though, since in fact we find a small but still significant number of enterprises are apparently in the excess supply regime and should not therefore be constrained in this way in their choice of labour input. This suggests that simultaneous equations bias may still be present if we use OLS but it should be only a small problem. An alternative approach to this problem is to use instrumental variables (IV). Unfortunately, the data set used suffers from a lack of possible instruments, and when we tried using simply lagged values of variables as instruments we obtained very poor results.

Marginal products, excess demand and supply of labour, and labour adjustment

When we compare the MPL with the wage we use the estimated marginal revenue product of labour net of turnover tax, which we refer to as the "net marginal product of labour" (NMPL). The Polish turnover tax is a linear sales tax and so acts as a wedge between the consumer and producer price of a good. Profit maximization in this context means maximization of profits at producer prices, i.e. net of turnover tax. This approach seems reasonable, since anecdotal evidence suggests that bargaining between the center and the enterprise over turnover tax bills was not typical.

Enterprises are separated into excess demand and excess supply categories simply by comparing their NMPLs with their labour costs. We make no attempt to correct for the fact that a firm whose NMPL differs only slightly from its labour costs is liable to be less reliably categorized. We then look at the change in employment by firm, measured as $\ln(L_t) - \ln(L_{t-1})$, and its relationship to the sign or degree of excess demand/supply, measured as ln(NMPL) - ln(labour costs). Those observations where a firm is in one regime at time t-1 and in the other regime at time t are excluded.

Data Sources. The annual enterprise-level data is from the Polish "Lista 500", the list of the 500 largest (by sales) state-owned manufacturing enterprises in Poland, published annually in the Polish journal Zarządzanie. We use data for the period 1984-88 and only for those enterprises which appear every year in the list. Deletion of a few additional firms which are tremendous outliers or suspected of corrupted data reduces the sample to 350 enterprises.

Socialist economic data are often criticized on a number of grounds, and these are no exception. The most serious problems are:

(1) Output is measured by total sales in nominal zloty. Production data in real zloty would be ideal, but we can only deflate and hope for the best. We make no attempt to construct sector-specific price indices, and use simply the implicit price deflator for socialized industry from the annual statistical yearbook (Rocznik Statystyczny) to put sales into approximate 1984 prices.

(2) Labour input is measured by average annual employment by the enterprise. Part-time workers are weighted as such. Data on hours worked is not given, nor are data on skill levels available. Note that in a full translog production function we cannot say that skill levels are in the firm-specific fixed effect because of the interactive terms between labour and capital and labour and materials.

(3) The figure for end-year fixed capital given in the Lista 500 is a mixed nominal/real number. The fixed capital stock of all enterprises was revalued at the end of 1982 in 1982 prices, and investment and depreciation from then on was done without attention to inflation, which by the end of the period was substantial. We first put the 1984 end-year mixed nominal/real capital stock for each enterprise into approximate 1984 prices by using industry-wide data from the statistical yearbook on the discrepancy between real and mixed nominal/real capital. We then calculate capital in subsequent years simply by deflating, using the implicit deflator for investment in industry, the increment in enterprise mixed nominal/real fixed capital (data on enterprise gross investment and depreciation is not given).

(4) Materials input also has measurement problems. It unfortunately includes depreciation of fixed capital, but this is typically small in industry (< 5%). It is given in nominal zloty, and we again simply deflate with the same deflator used for output.

(5) Remuneration is also in nominal zloty, and we again use the same deflator (the consumer price deflator is little different). It is composed of the basic wage plus the bonus paid from profit. To approximate labour costs we take the stylized ratio of labour costs to remuneration given by the World Bank for 1986 taken from Table 3.1 above - 1.77 - and multiply the average remuneration for each firm by this figure. This approximation should be reasonable since the major missing components from labour costs, social security contributions and wage taxes, were (supposed to be) applied at the same linear rate for all enterprises. In Poland, the bonus earned in a year is paid in March of the following year, which poses a problem for our comparisons of labour costs and marginal products. We make no attempt to correct it.

IV Empirical Results

Production function estimates

We start out by estimating a general translog production function in levels and first differences; the software package used is DPD, developed by Arellano and Bond (1988). We use the test statistics of first order and second order serial correlation developed by Arellano and Bond to decide which specification will give us consistent estimates. These test statistics which are based on the residuals of the estimated regression are distributed as a standard normal as the number of observational units gets large.[4] These statistics also allow us to say something about how likely the presence of fixed effects is or whether the error term is characterized by a random walk.

When we estimated the production function in levels without allowing for fixed effects we got massive first and second order serial correlation. Such a result is expected if the true model has either fixed effects or a random walk characterization of the error term. Of course, it could also indicate the presence of both. After estimating the equation in differences, however, the test statistics give us additional information about the underlying data generation process. To see this let us assume two different types of this process:

Model (a)

$y_t = X_t\beta + f + u_t$, t=1,...,T. y, X, have the normal interpretation of stacked vectors and matrices, f is a vector of stacked fixed effects, while the error vector is distributed as white noise.

Model (b)

$y_t = X_t\beta + u_t$, t=1,...,T. Assume that $u_t = u_{t-1} + \varepsilon_t$, where ε is distributed as white noise.

In model (a) we have fixed effects and white noise errors, while (b) has no fixed effects and random walk error terms. When we difference (a) we have negative first order serial correlation and no second order serial correlation. After differencing (b) the error terms are just white noise and uncorrelated with each other. The test statistics of serial correlation presented in Table 3.2 show no first order serial correlation in the differenced errors. This can be taken as evidence against model (a) and for the presence of a random walk element. It is preferable, however, to perform such a test on a more general model. We assume an AR(1) process of the error term and the presence of fixed effects in our equation and use the procedures as outlined in Bhargava, Franzini and Narendranathan (1982) to estimate ρ and to test for a unit root. The Durbin-Watson statistic is 1.07 and the adjusted estimated ρ is 0.91. We then use the Durbin-Watson statistic to test for a unit root. Since according to the above authors the upper critical value is 0.93 under the null hypothesis we can reject the existence of a unit root.[5]

In sum, our tentative conclusion is that the data generation process is well represented by the presence of fixed effects and an AR(1) error process that is close to, but significantly different from, a random walk. Since the estimated ρ is nearly 1, first differencing achieves almost the same efficiency as quasi-differencing using this estimate. For our preliminary investigations, therefore, we use parameter estimates obtained from estimating the equation in first differences.

Table 3.2 gives the results of the estimation of the unrestricted translog production function in first differences form. The standard errors and the other test statistics are computed in such a way that they are consistent in the presence of general heteroscedasticity. The only coefficients which need some further explanation are the coefficients on the constant and the time dummies. The coefficient on the constant term gives the intercept coefficient for the first cross-section used in estimation, while those on the dummy variables are deviations from this initial intercept value.

From this general production function we want to find the specific production function which most closely reflects the underlying data generation process. The Wald test chosen by us rejects the null hypothesis that the squared and interactive terms are jointly not significantly different from 0, i.e. it rejects a simple Cobb-Douglas specification of the production function. We therefore proceed to impose a single restriction (that a coefficient is equal to zero) at a time on the coefficient with the lowest absolute t-value and then re-estimate the production function incorporating this restriction. We repeat this procedure until we are left with those regressors which have absolute t-values greater than 1 (except for the constant term, which is always retained in the equation).

The result of this "testing down" procedure can be seen in Table 3.3. The coefficients on the k^2-term and the $l*m$-term were found to be not significantly different from 0, and in our final estimation of the production function we imposed zero restrictions on these two coefficients. Our calculations of marginal products of inputs, elasticities of substitution among inputs and degree of homogeneity of the production function for each individual firm were then calculated using the coefficient estimates of Table 3.3.

The estimated production function seems reasonable. Figures 3.3-3.9 present the distributions in the sample of the estimated marginal products, elasticities of substitution, and degree of homogeneity. The distributions include observations in every year on every enterprise. The number appearing below a bar in a bar chart is the lower bound for that bar.

Marginal products are nearly always positive, as we would expect. Second derivatives (not shown) are nearly always negative, again as expected. The marginal product of capital seems plausible--usually between 4% and 20%. An interesting feature of the marginal product of materials is that it is generally less than one. This suggests over-use of materials by enterprises and is consistent with the view that socialist economies are material-intensive. It is also an indication that the enterprises are not behaving as profit-maximizers, since most could increase their profits by lowering their materials usage. The elasticities of substitution between factors also seem plausible; all three elasticities typically lie in the range 0.6-0.8. Finally, the point estimates of the degree of homogeneity suggest that most firms faced decreasing economies of scale. Finally, Table 3.3 shows that total factor productivity fell by 0.6% over 1984-85 (the constant term), increased over 1985-86 by 4.3% (the 1986 time dummy plus the constant), by 1.7% over 1986-87, and by 0.9% over 1987-88, making for a total increase in TFP over 1984-88 of about 7%. By comparison, the figures for annual labour productivity growth in the sample were rather higher--5.8%, 9.9%, 4.0% and 4.6%, making for a total growth in labour productivity in the period 1984-88 of over 24%--indicating over two thirds of the growth in labour productivity over the period is accounted for by changes in input usage rather than technical progress.

Figure 3.10 shows the distributions of the net marginal product of labour and labour costs. Note that the range of labour costs is much narrower than the range of marginal products. This is consistent with the earlier observation that wage scales in socialist economies tend to be compressed. Also note that the mean net marginal product of labour is clearly higher than the mean labour cost, as predicted by the simple neoclassical view.

Table 3.4 makes this last point more clearly. It compares the net marginal product of labour with labour costs, by year. The results are quite clear; in every year, out of 350 enterprises, about 300 have an NMPL which exceeds the cost of labour. That is, about 85% of enterprises, if they were static neoclassical profit maximizers and were unconstrained in the labour market, would want to hire more workers at the given wage.

So far the neoclassical story is not contradicted by the empirical evidence. We now consider labour adjustment. Figure 3.11 shows the distribution of enterprise employment growth. Most firms actually shed rather than hired workers. This could be consistent with the neoclassical story. Labour supply to socialist industry was shrinking during this period, moving the labour supply curve left. Firms whose wage was set below the equilibrium wage w_e would be constrained in the labour market, and employment would decrease as workers left firms (see Figure 3.2). We then divide firms according to whether the wage was below or above the NMPL; we include only observations on firms for which this was true in two consecutive periods. Figure 3.12 plots the distribution of the percent change in enterprise employment for the enterprises in the two groups. Most (67%) of the enterprises whose labour costs were below the net marginal product of labour, and therefore were below the labour demand curve, shed labour. Based on the dynamics in Figure 3.2, this would place the administered wage below the equilibrium wage w_e, which is consistent with the simple neoclassical story. We are unable to say how many of the remaining 33% were operating with an administered wage below the equilibrium wage.

When we consider those firms operating above the labour demand curve, we have a problem. According to the simple dynamics in Figure 3.2, all such firms should shed labour; but in fact only a little more than half (56%) did so. Indeed, a greater proportion of these enterprises took on more workers than did the group whose wages were below the net marginal products. This evidence runs directly against the simple neoclassical story of labour demand. Another way to see this is from the scatter plot in Figure 3.13, with the percent difference between the net marginal product of labour and labour costs on the horizontal axis and the percent change in employment on the vertical axis. We expect that below zero on the x-axis (or near zero, since we have only approximate labour costs) we should see mostly decreases in employment; but we don't. It is interesting to note that the failure of firms with too many workers to shed some of them suggests the possible existence of hidden unemployment. We should caution, however, that the above test is based on a relatively small number of observations at the extreme end of a distribution.

A more econometric, but still rather ad hoc, approach to this question is as follows. Say that the administered wage is below the equilibrium wage w_e. In this case we would expect to see a slow movement of employment towards the labour supply curve (see Figure 3.2). We begin by modelling this in a simple partial adjustment framework. First, say the long-run (log) level of employment l^* of firm i is given by some firm specific constant and the (log) wage, where the coefficient on the log wage β is the long-run elasticity of labour supply with respect to the wage:

$$l_{it}^* = \alpha_i + \beta w_{it} \tag{3.5}$$

Log labour adjusts according to the usual partial adjustment equation, where lambda is the speed of adjustment:

$$l_{it} - l_{it-1} = (1-\lambda)(l_{it}^{*} - l_{it-1}) \tag{3.6}$$

Substituting, rearranging, and adding an error term, we obtain:

$$l_{it} = (1-\lambda)\alpha_i + (1-\lambda)\beta w_{it} + \lambda l_{it-1} + \varepsilon_{it} \tag{3.7}$$

Take first differences to remove the firm-specific fixed effect and we obtain as the basic estimating equation:

$$l_{it}-l_{it-1} = (1-\lambda)\beta(w_{it}-w_{it-1}) + \lambda(l_{it-1}-l_{it-2}) + \varepsilon_{it} - \varepsilon_{it-1} \tag{3.8}$$

Now consider the role of labour demand. If in fact the administered wage exceeds the equilibrium wage w_e, then according to the dynamics of Figure 3.2 the direction of labour adjustment would be given by the difference between the marginal product of labour and the wage: if, for firm i, $MPL_i > w_i$, then employment by firm i would increase, and visa-versa if $MPL_i < w_i$. And even if the administered wage is below the equilibrium wage, we might still expect the marginal product of labour to influence employment. A firm with a marginal product of labour that exceeded the administered wage, but which was losing workers because the wage was below the equilibrium wage (region A in Figure 3.2), would try to slow the rate of labour shedding by, say, firing fewer workers than it would otherwise, or trying to retain those workers who have announced their intention to leave, etc. Put another way, in terms of Figure 3.2, we would expect the rate of labour shedding to be greater in region A than in region D.

This suggests adding the ratio NMPL/(labour costs) to the partial adjustment estimating equation. We would expect to find a positive coefficient if firms are profit maximizers: the higher the value of NMPL/(labour costs), the more valuable an additional unit of labour is to the firm and so the increase in employment should be greater (or the decrease smaller).

The results of this estimation are given in Table 3.5. OLS estimation is inappropriate here since the lagged dependent variable, used as a regressor in the equation is correlated with ε_{t-1}. We instrumented the lagged dependent variable with lagged values of ln l (l_{t-2}, l_{t-3} etc.) and employed the general-method-of-moments estimator using all possible moment restrictions . The Sargan test indicates that our choice of instruments is satisfactory. Time dummies are used while industry dummies are excluded from the set of regressors[6]. The constant is interpreted as the growth rate of employment in the first period (1985-86); the time dummies give the deviations from this base rate. The test statistic for (negative) first order serial correlation is significant, the statistic for second order serial correlation is not; this is consistent with ε being a white noise error term in the equation in levels, before first differencing. The speed of adjustment lambda (the coefficient on the change in lagged log employment) is highly significant, and with a value of 0.64, still reasonable. The coefficient on the change in the log wage has the right sign but not too well defined, and the implied long run wage elasticity of labour supply is quite low (0.10). Finally, the coefficient on NMPL/labour costs is near zero and of the wrong sign, but insignificant. We can interpret this as further evidence that firms are not behaving as profit maximizers; changes in employment do not seem to be influenced by differences between the net marginal product of labour and the cost of that labour.

V Conclusions

In this chapter we have estimated a production function and examined the dynamics of labour adjustment using data from a panel of Polish industrial firms over the period 1984-88. The production function estimates seem reasonable, and the finding that the marginal products of labour are generally above enterprise labour costs is consistent with the simple neoclassical model of labour demand we use. However, the dynamics of employment predicted by this simple model for firms whose wages exceed their marginal products of labour are not confirmed by the data. We also find that the marginal product of materials of most firms is less than one, which is also evidence against the model we use.

If the model and its estimation are correct, the results above--the failure of labour to adjust as predicted, and also the estimated marginal product of materials--suggest that socialist firms were not behaving as profit-maximizers. It is perhaps worthwhile ending this section with a list of possible explanations for this finding.

1. The model is incorrect. A properly worked-out neoclassical model with dynamic optimization and adjustment, expectations, etc. treated properly could yield results consistent with profit-maximization.

2. The model is incorrect; wages are endogenous. This could complicate the dynamics considerably, since enterprises may temporarily lower or raise wages in order to shed or attract workers. For example, the fact that a firm's wage exceeds its net marginal product of labour may be the result of a temporary increase in the wage in order to attract extra workers.

3. The production function specification is too restrictive. All enterprises are assumed to share the same coefficients (aside from the intercept) regardless of, say, industry.

4. The data are unreliable. In particular, we do not have data on separate categories of labour by skill level, data on labour costs are only approximations based on wages, and materials are measured inaccurately.

5. The model is incorrect; socialist firms are not profit-maximizers.

As noted in the introduction, the work reported here is preliminary in nature. In the next stage of our work we will address (1) above directly and develop a proper model of employment level in socialist firms. We may also address point (2) and incorporate a theory of socialist wages. Estimations of the production function will allow for industry-specific coefficients (point 3). There is little we can do with the data we have to enhance its reliability except construct industry-specific price deflators using aggregate industry data (point 4). And keeping point (5) in mind as we do this is a good idea.

Footnotes

* This chapter is based on joint research with Mark Schaffer.

1. See, for example, Gomulka and Rostowski, 1984.

2. Freeman (1987) makes this argument.

3. See Berend and Ránki, 1985, ch. 7.

4. A detailed description of these statistics can be found in Arellano and Bond (1990).

5. Of course, these statistics also strongly reject the hypothesis of white noise errors; for example, model (a).

6. We first included industry dummies. However, a Wald test for the joint significance of industry dummies produced a test statistic of 18 (with df=10) which is insignificant at the 5% level.

Table 3.1

Stylized Zloty Monthly Wage Costs, 1986

Basic Wage	20,000
Soc. Sec. & Payroll Tax	12,600
Social Fund	2,700
Housing Fund	1,350
Share of Profit	1,500
	38,150

Source: World Bank (1987), p. 160.

Table 3.2

Unrestricted Estimates of the Production Function

FIRST DIFFERENCES OLS

Number of firms: 350 Sample period is 1985 to 1988

Observations: 1400 Degrees of freedom: 1387

Dependent variable is: Log(sales)

RSS = 10.012823 TSS = 15.758543

Estimated sigma-squared (levels) = 0.003610

ONE-STEP ESTIMATES WITH ROBUST TEST STATISTICS

Wald test of joint significance: 342.582198 df = 9

Wald test - jt sig of time dums: 73.588906 df = 4

Wald test selected by user: 11.639890 df = 6

(H_0: $\alpha_4=\alpha_5=.....=\alpha_9=0$)

Var	Coef	Std.Error	T-Stat	P-Value
const	-0.005970	0.006982	-0.855079	0.392508
k	0.317792	0.458386	0.693284	0.488131
l	-1.363388	0.629529	-2.165729	0.030332
m	0.795485	0.440500	1.805866	0.070939
l^2	0.075495	0.049019	1.540110	0.123534
r^2	0.028459	0.033395	0.852188	0.394110
m^2	0.048948	0.027337	1.790540	0.073367
lk	0.054101	0.065874	0.821280	0.411487
lm	-0.003170	0.061084	-0.051889	0.958617
km	-0.126489	0.047740	-2.649546	0.008060
td(86)	0.049070	0.006195	7.920756	0.000000
td(87)	0.023762	0.006929	3.429582	0.000605
td(88)	0.015127	0.007420	2.038786	0.041471

Robust test for first-order serial correlation: 0.721 [350]

Robust test for second-order serial correlation: 0.183 [350]

Table 3.3

Estimates of the Production Function with Coefficient Restrictions

FIRST DIFFERENCES OLS

Number of firms: 350 Sample period is 1985 to 1988

Observations: 1400 Degrees of freedom: 1389

Dependent variable is: Log(sales)

RSS = 10.019058 TSS = 15.758543

Estimated sigma-squared (levels) = 0.003607

ONE-STEP ESTIMATES WITH ROBUST TEST STATISTICS

Wald test of joint significance: 298.307384 df = 7

Wald test - jt sig of time dums: 71.972309 df = 4

Wald test selected by user: 9.186939 df = 4

(H_0: $\alpha_4=\alpha_6=\alpha_7=\alpha_9=0$)

Var	Coef	Std.Error	T-Stat	P-Value
const	-0.006048	0.006680	-0.905360	0.365275
k	0.499796	0.371156	1.346591	0.178112
l	-1.474437	0.637567	-2.312600	0.020745
m	0.740753	0.308850	2.398420	0.016466
l^2	0.059834	0.045766	1.307391	0.191080
m^2	0.048605	0.026712	1.819579	0.068823
lk	0.090520	0.054959	1.647032	0.099551
km	-0.122498	0.051178	-2.393553	0.016686
td(86)	0.049121	0.006273	7.830822	0.000000
td(87)	0.023697	0.006967	3.401471	0.000670
td(88)	0.015457	0.007128	2.168610	0.030112

Robust test for first-order serial correlation: 0.768 [350]

Robust test for second-order serial correlation: 0.161 [350]

Table 3.4

Labour Costs vs. Net Marginal Products of Labour

Year	Number of firms (percent of sample) whose estimated net marginal product of labour exceeded its estimated labour costs.	Number of firms (percent of sample) whose estimated net marginal product of labour exceeded the sample labour costs.
1984	288(82.3%)	280(80.0%)
1985	301(86.0%)	290(82.9%)
1986	307(87.7%)	295(84.3%)
1987	312(89.1%)	305(87.1%)
1988	307(87.7%)	295(84.3%)

Total number of firms in the sample:350.

Table 3.5

Estimates of the Labour Adjustment Equation

FIRST DIFFERENCES INSTRUMENTAL VARIABLES

Number of firms: 350 Sample period is 1986 to 1988

Observations: 1050 Degrees of freedom: 1044

Dependent variable is: ΔLog(L)

RSS = 1.358547 TSS = 1.632070

Estimated sigma-squared (levels) = 0.001301

TWO-STEP ESTIMATES WITH ROBUST TEST STATISTICS

Wald test of joint significance: 242.054427 df = 3

Wald test - jt sig of time dums: 42.147905 df = 3

Sargan test (validity of instruments): 10.959501 df = 8

Var	Coef	Std. Error	T-Stat	P-Value
const	0.002897	0.003628	0.798453	0.424608
ΔLog(wage)	0.037663	0.031601	1.191847	0.233321
ΔLog(L(-1))	0.639681	0.041367	15.463581	0.000000
NMPL/(L costs)	-0.001220	0.002568	-0.475181	0.634658
td(87)	-0.006896	0.004138	-1.666576	0.095599
td(88)	-0.021902	0.004188	-5.229581	0.000000

Robust test for first-order serial correlation: -2.857 [350]

Robust test for second-order serial correlation: -1.152 [350]

Figure 3.1
Labour Market Disequilibrium for an Individual Enterprise,
Instantaneous Adjustment

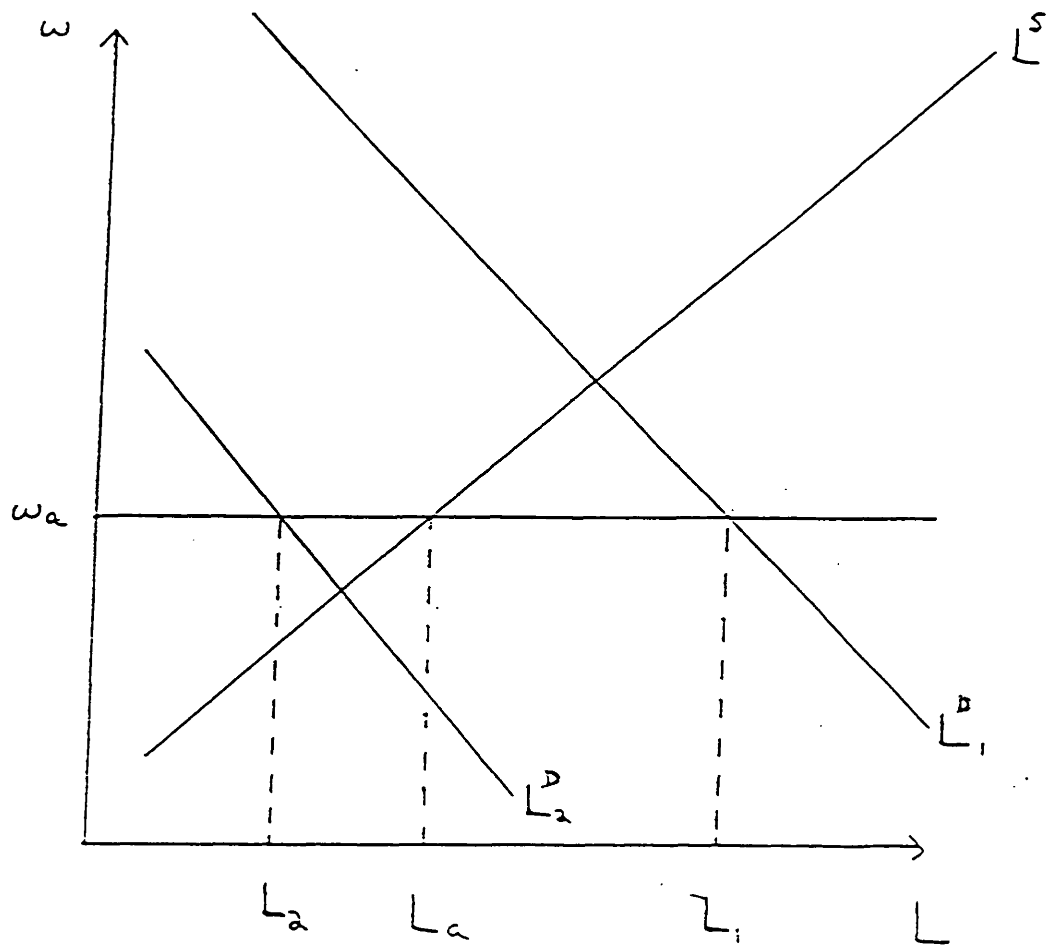


Figure 3.2
Labour Market Disequilibrium for an Individual Enterprise, *Slow Adjustment*

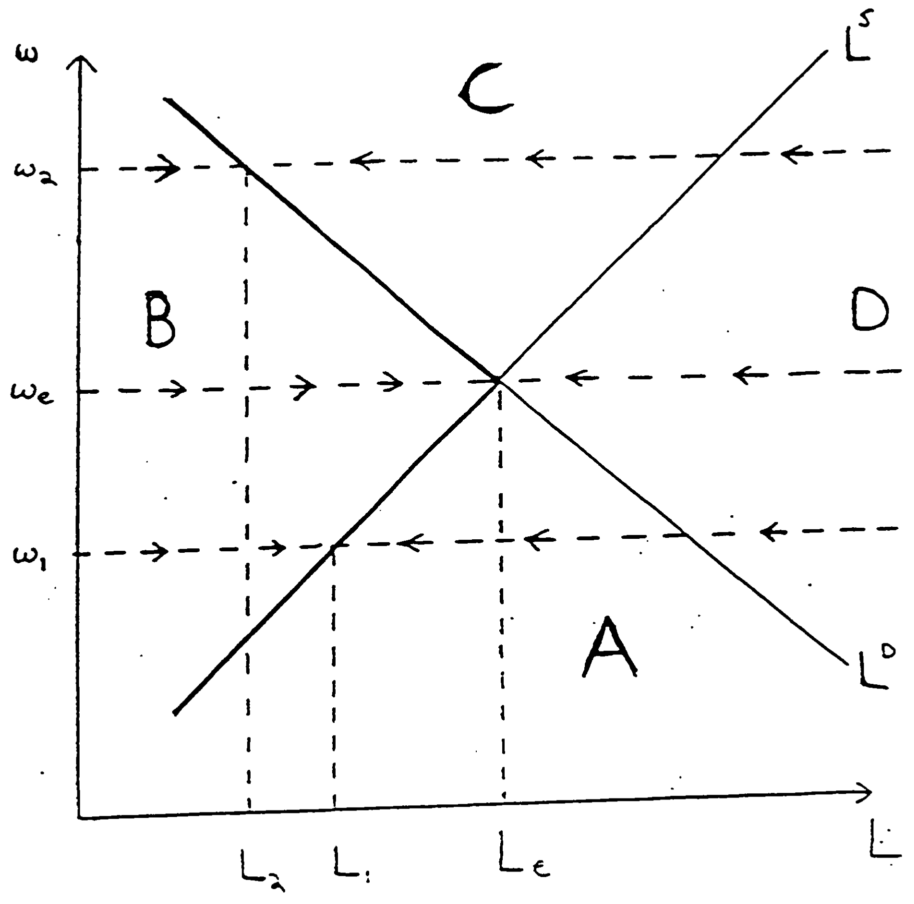


Figure 3.3
Distribution of Estimated Marginal Product of Labour

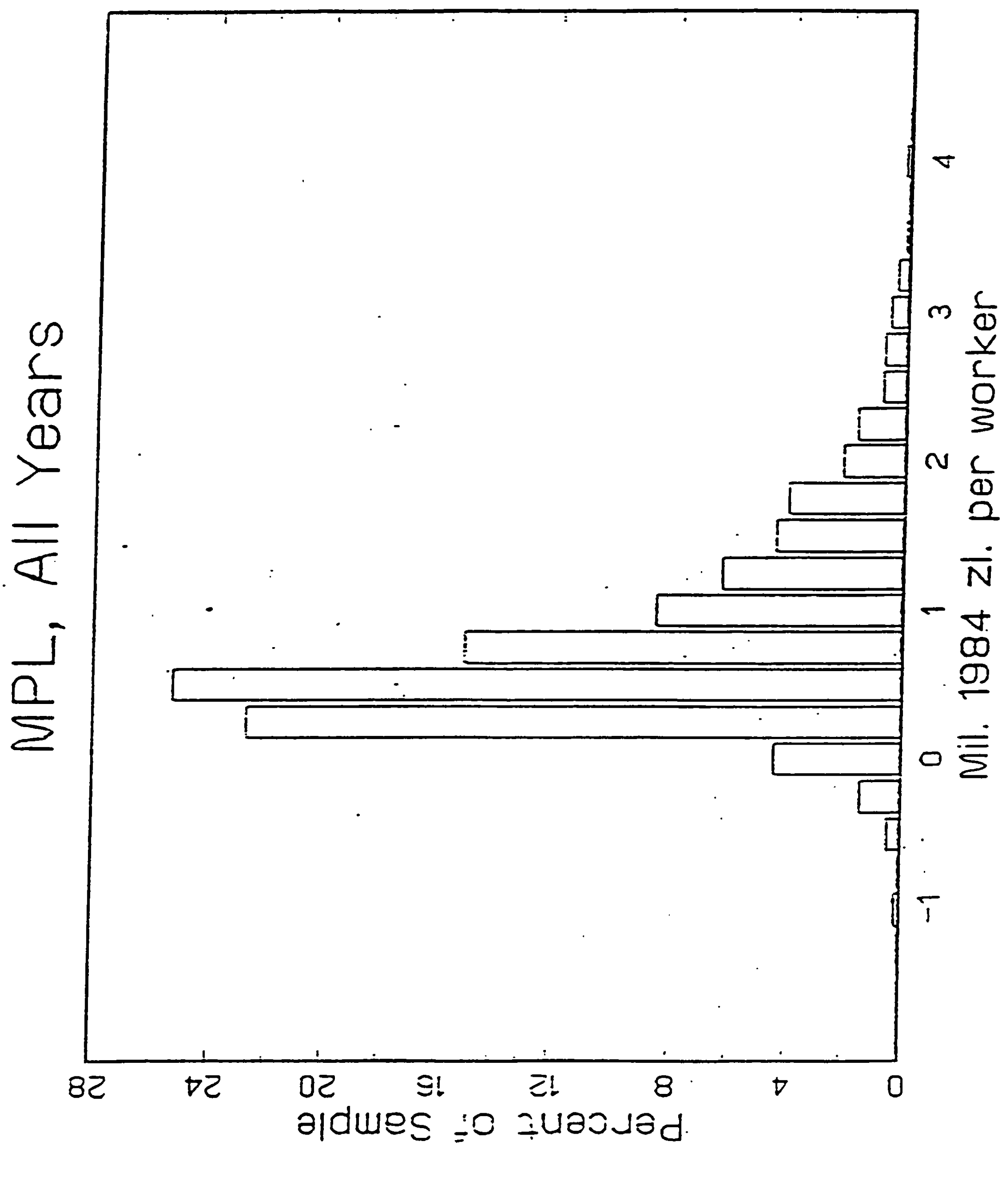


Figure 3.4
Distribution of Estimated Marginal Product of Capital

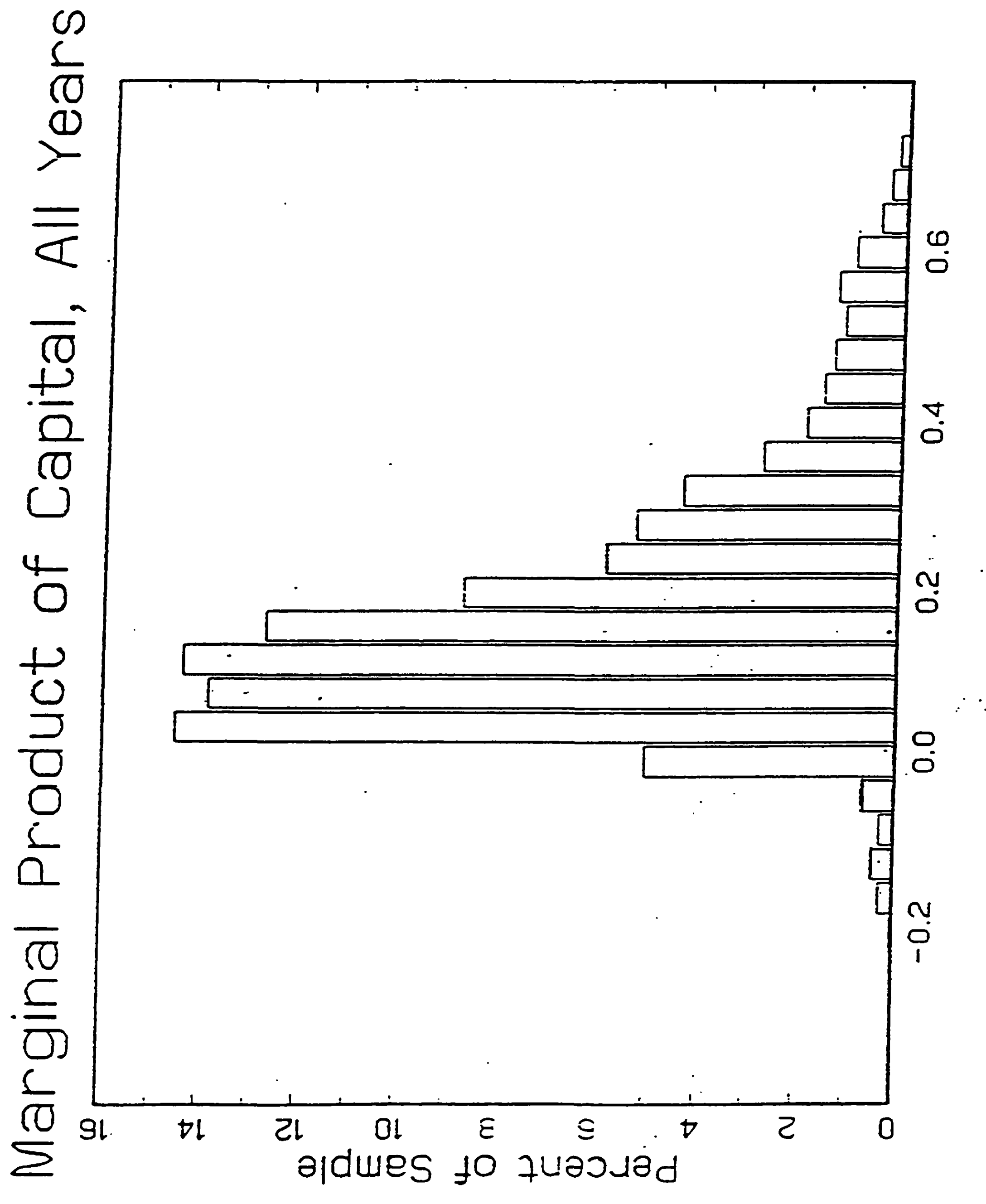


Figure 3.5
Distribution of Estimated Marginal Product of Materials

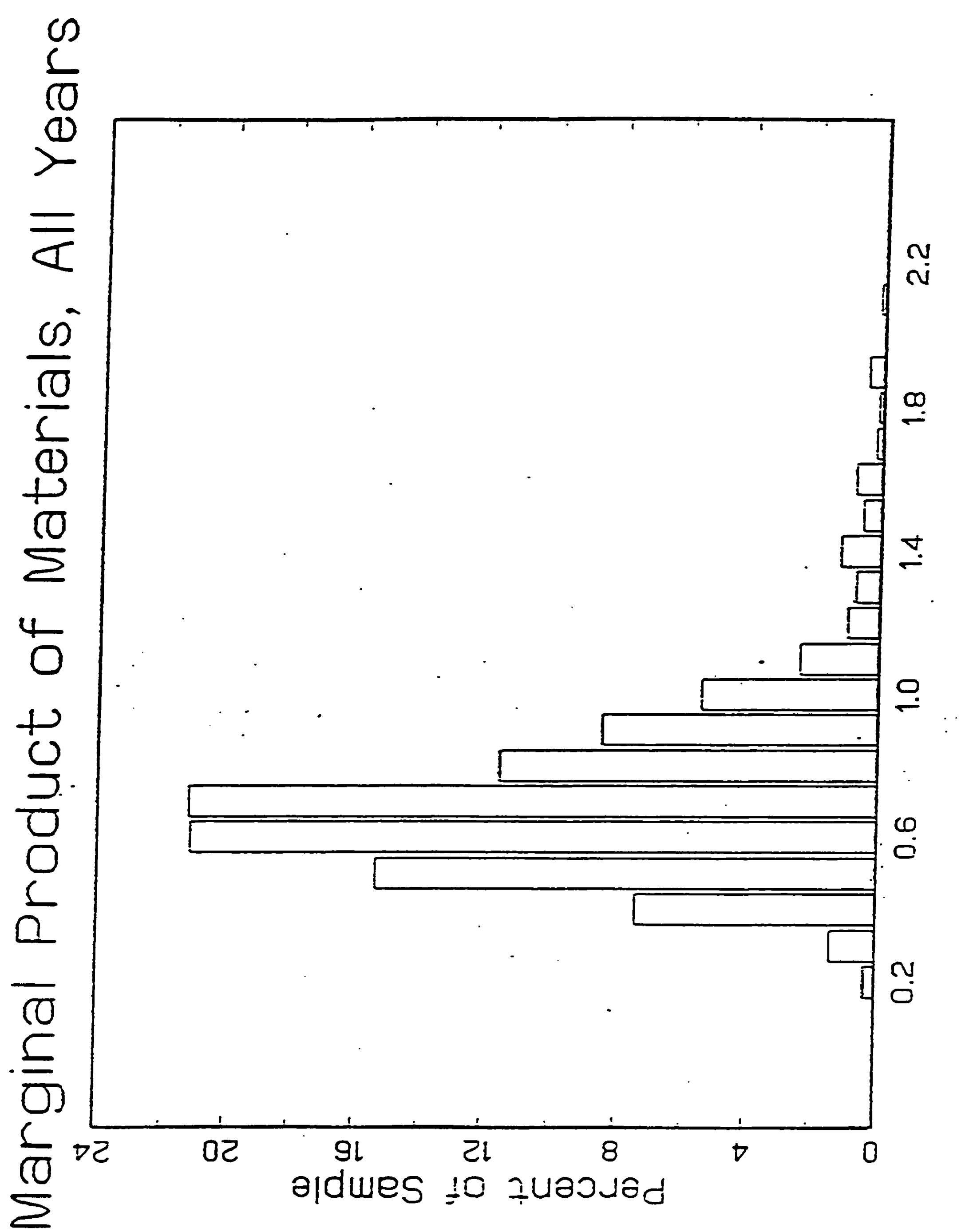


Figure 3.6
Distribution of Estimated Labour-Capital Elasticity of Substitution

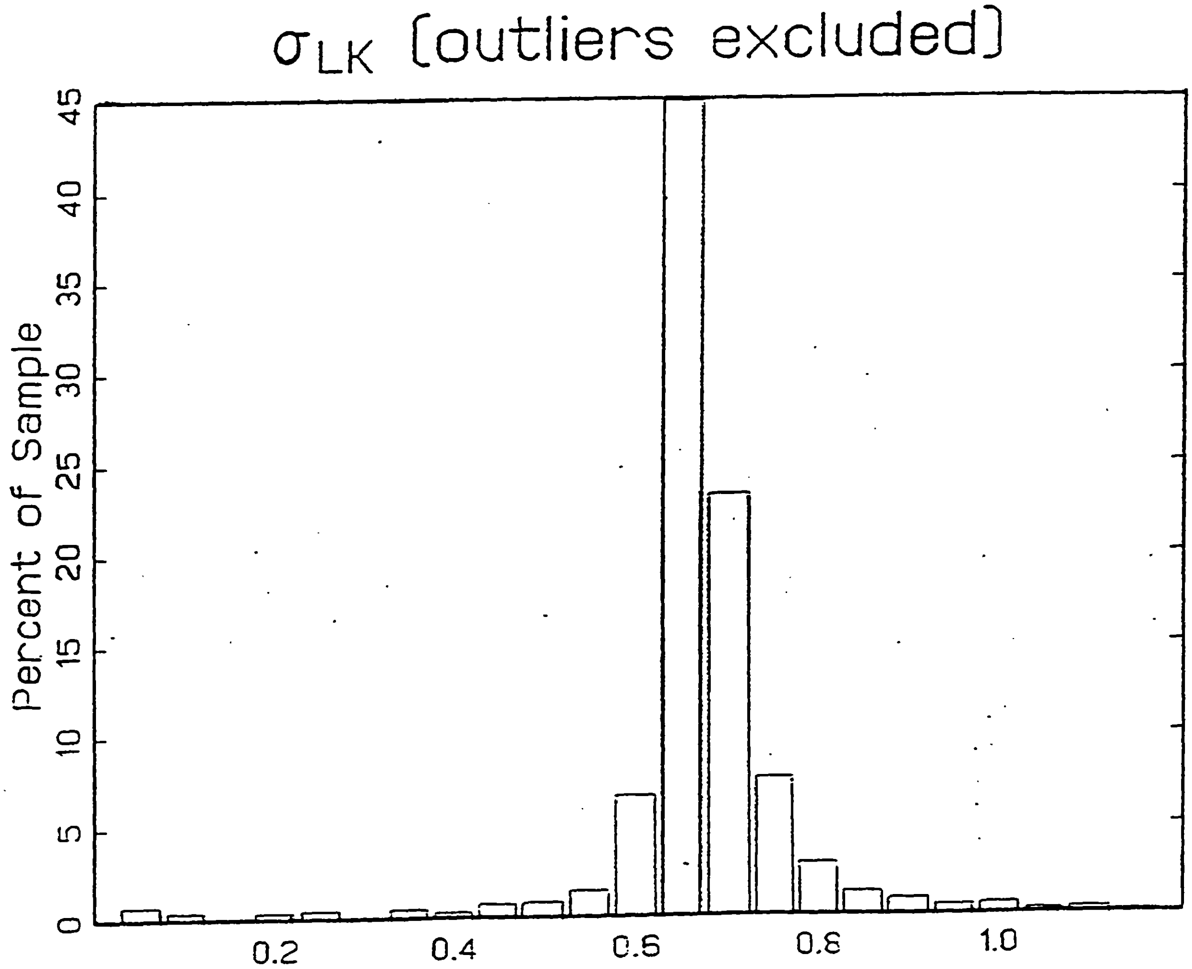


Figure 3.7
Distribution of Estimated Capital-Materials Elasticity of Substitution

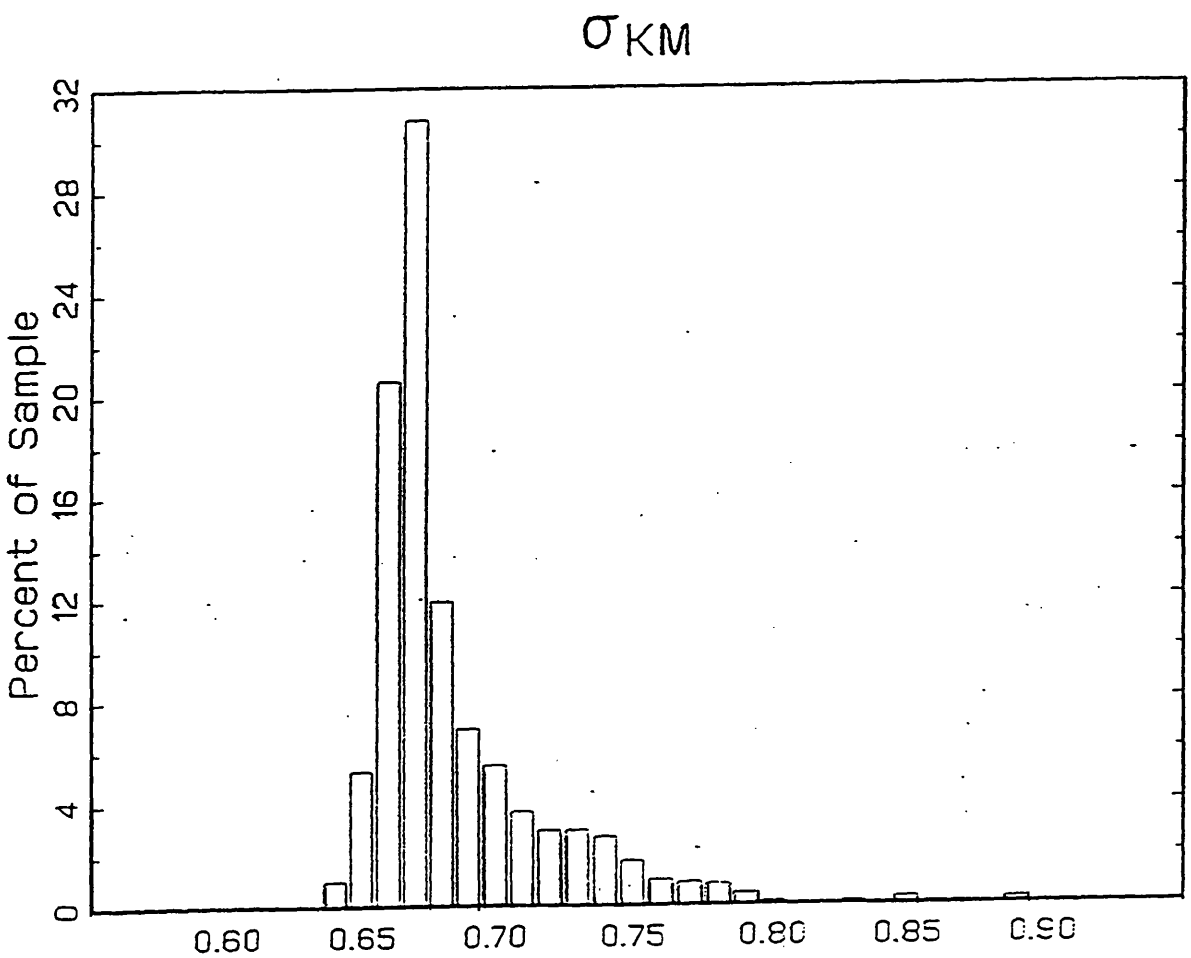


Figure 3.8
Distribution of Estimated Labour-Materials Elasticity of Substitution

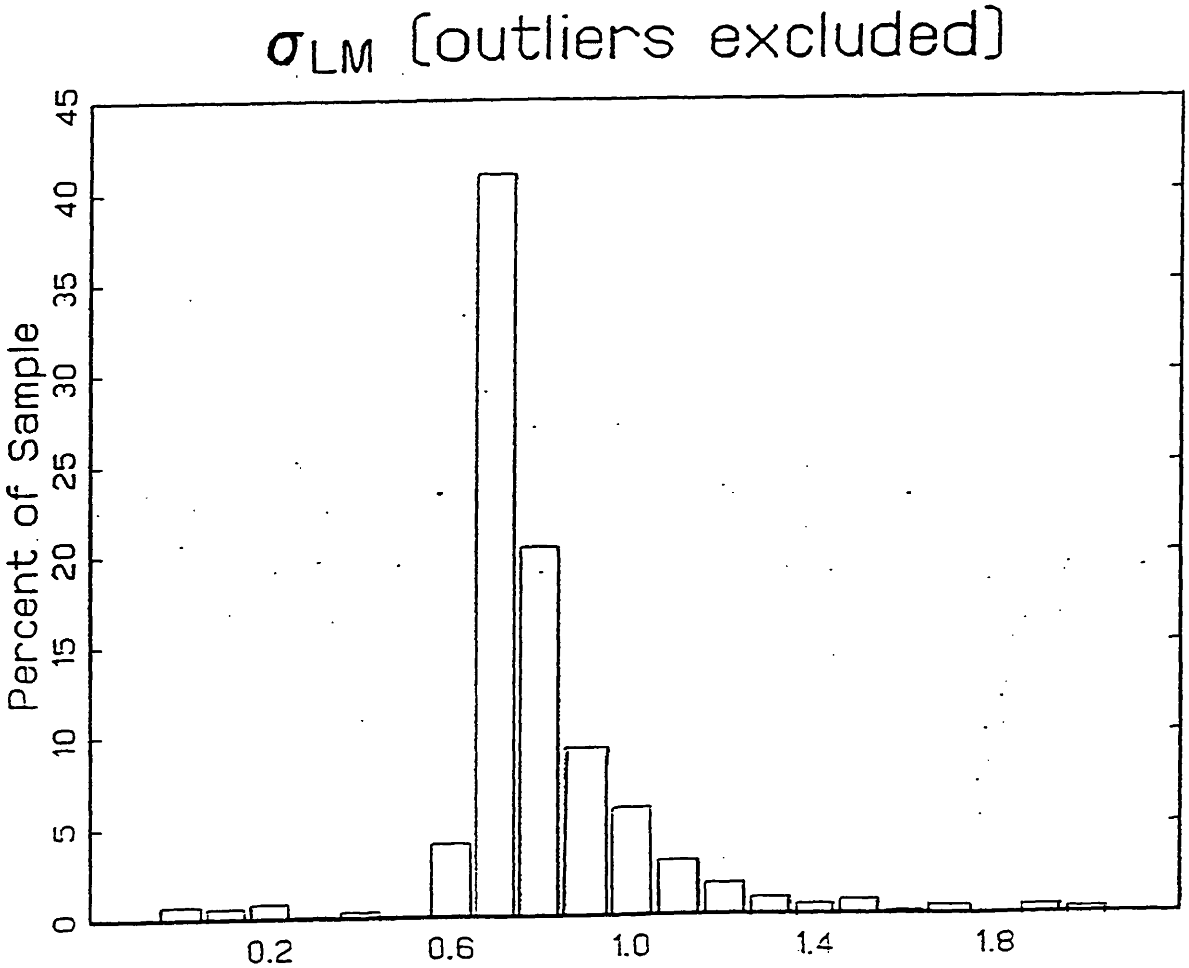


Figure 3.9
Distribution of Degree of Homogeneity

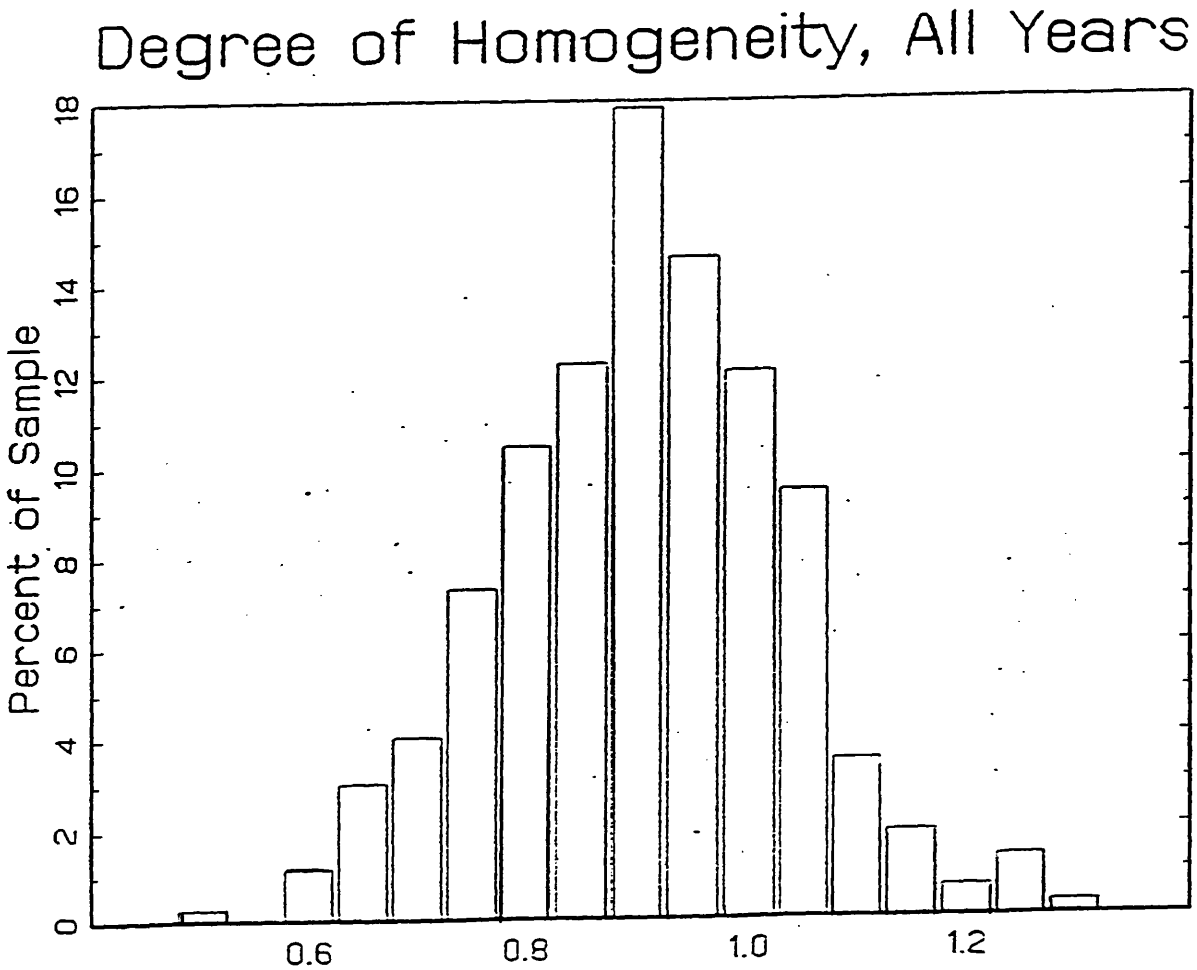


Figure 3.10
Net Marginal Product of Labour and Labour Costs

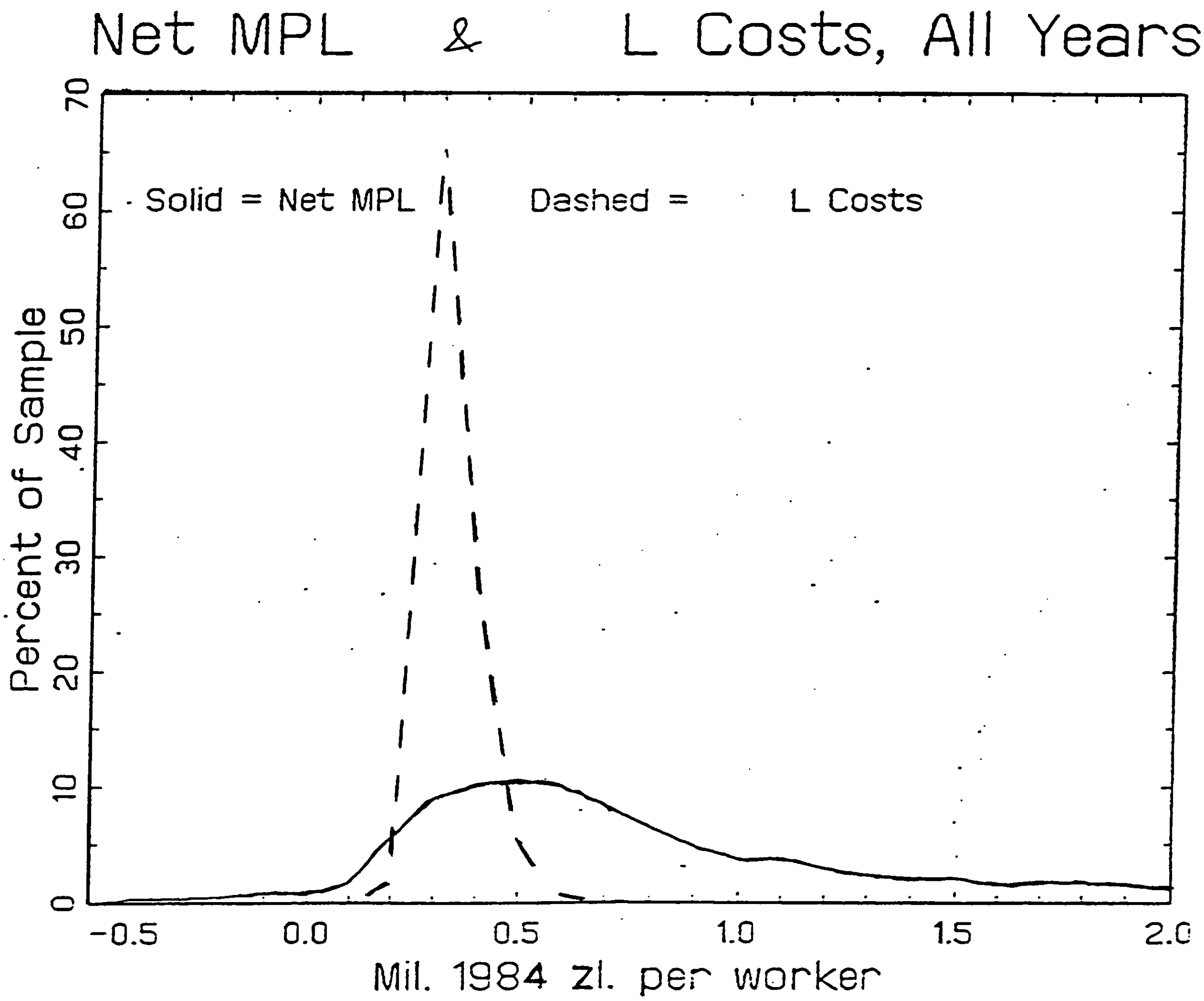


Figure 3.11
Distribution of Employment Growth

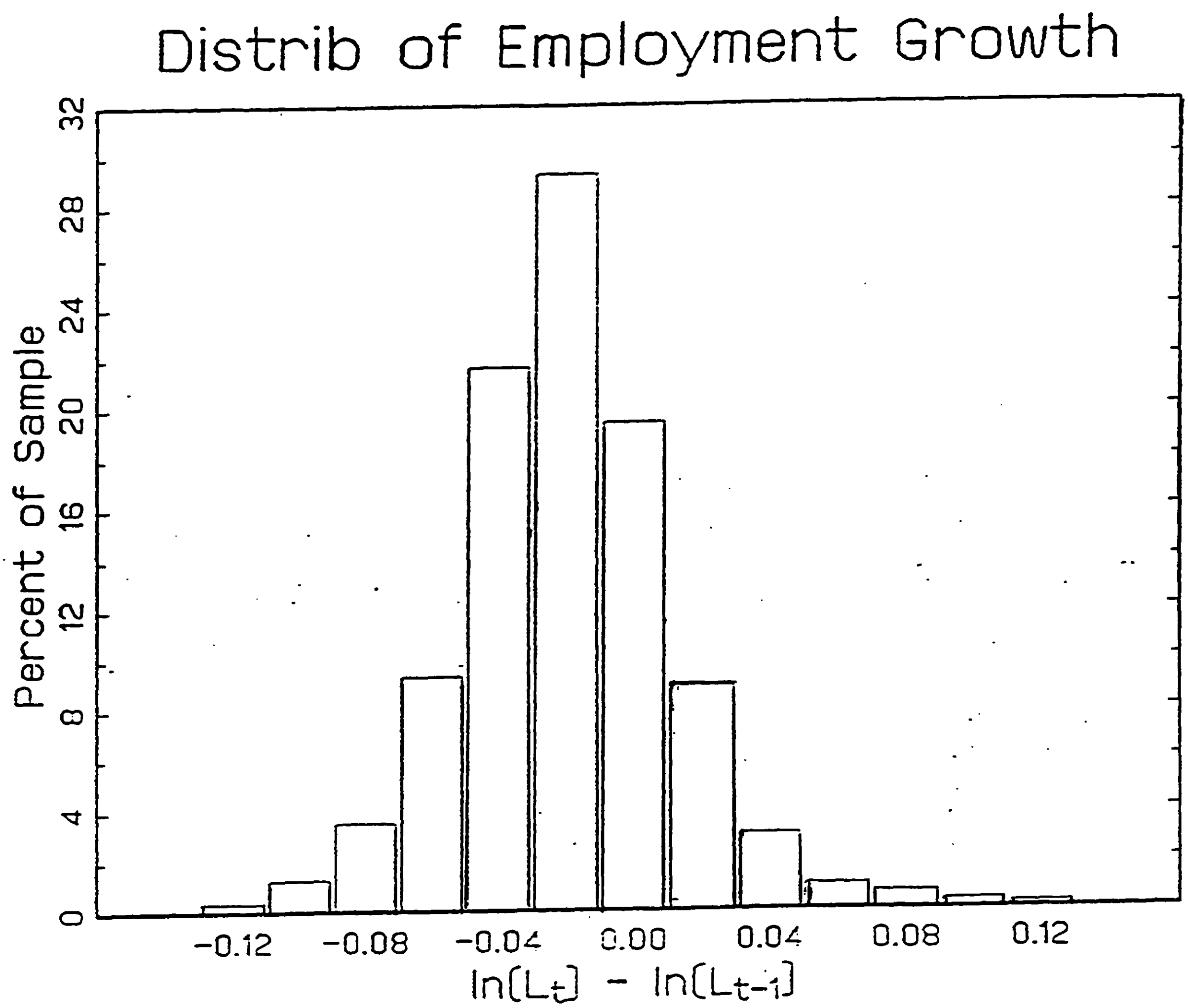


Figure 3.12
Distribution of Employment Growth by Group of Enterprises

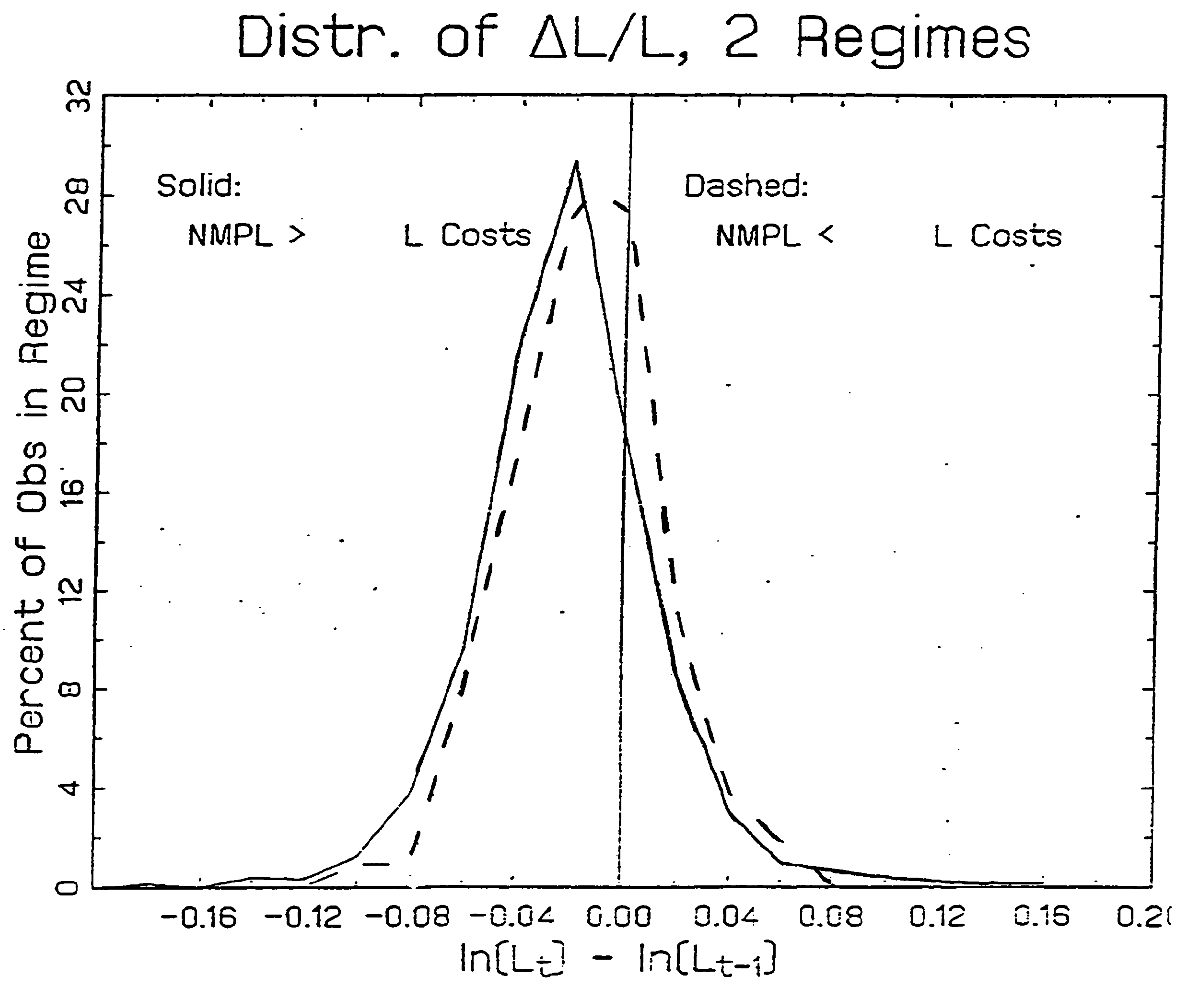
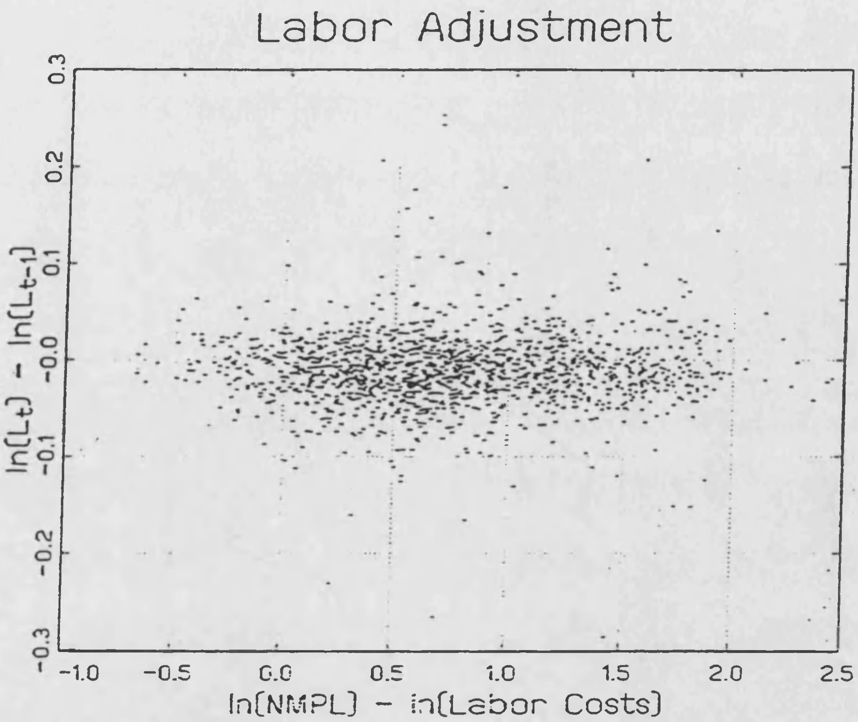


Figure 3.13
Labour Adjustment



Chapter 4

Flow and Stock Analysis of Polish Unemployment: January 1990 - June 1991*

I Introduction

There have been some attempts to describe and explain the development of wages and unemployment in Poland in the period from January 1990 until the beginning of 1991 (Coricelli and Revenga, 1991; Rutkowski, 1991). This chapter tries to shed additional light on the unemployment phenomenon as it evolved through the first 18 months after the "Big Bang".

An economy in transition is meant to be an economy "on the move" with e.g. displacement of workers in the socialized sector and ultimate absorption of these workers (or some of them) in the private sector. It strikes us, therefore, as sensible to analyze the flows which occur in the Polish labour market. Since we want to probe deeper into unemployment we are particularly interested in the <u>flows into and out of unemployment</u>. Even though there is very little quantitative information for the reported period about these flows we are able to describe the composition of these flows and their main determinants. In conjunction with the analysis of stock data on unemployment and vacancies this gives us some important (and quite firmly grounded) insights into the nature of Polish unemployment in the period under discussion. The four most important insights which we gain from our analysis can be summarized as follows:

1. Throughout 1990, a very substantial portion of the growing stock of unemployed were people from outside the labour force.

2. There have been no layoffs on a large scale in the socialized sector.

3. In the discussed period, demand and supply shocks were experienced across the socialized sector arising from the stabilization and price liberalization programme and have been mainly responsible for the rise in unemployment. Restructuring, on the other hand, has not been an important source of unemployment.

4. Unemployment can be expected to rise to much higher levels in the near future if restructuring gets under way in earnest.

The newest changes to the Act on Employment which came into force after July 1991 are not incorporated into this chapter as we limit our analysis to the first 18 months after the "Big Bang". The most important change is the ending of unemployment benefits after 12 months. As far as the labour market is concerned, we see the first 18 months after the implementation of the reform programme as a period contained in itself without any major structural breaks. The chapter would in our opinion lose some of its cohesiveness if we included more than the first 6 months of 1991.

In the next section we present the framework of our flow analysis of unemployment and discuss the composition of the various flows and their determinants. Section 3 takes a close look at all the stock variables that are available. We then give some conclusions.

II Flow Analysis of the Polish Labour Market

The main criticisms directed against flow analysis of unemployment are twofold. First, some economists argue that flow analysis cannot well track the dynamics of unemployment because the size of inflows and outflows relative to the unemployment stock is too large. Second, the distinctive nature of the states unemployment and out of the labour force is often questioned. Lehmann (1991) shows that in West European economies even quarterly flows are smaller than the unemployment stocks in times of relatively high unemployment.[1] In the Polish case, after a few months in 1990, the stock of unemployment became quite large. We assume and we try to justify this in the chapter that this build-up was due to very limited outflows. The relatively slowly rising stock of unemployment after this initial phase under the assumption of limited outflows would point to a large stock relative to inflows. In the above cited paper, Lehmann also discusses the question whether in Poland the economic behaviour of the unemployed and of persons who are out of the labour force is distinct. During 1990, a substantial proportion of the unemployed were only on the register to receive benefits and were, therefore, not fully distinct in their economic behaviour from people who are out the labour force. This problem of coinciding behaviour has become less important after some changes to the legal environment towards the end of 1990.[2]

Analyzing labour flows in a developed Western economy one normally distinguishes six flows between three states: employment, unemployment and out of the labour force.[3] In transition economies, because of the rapidly changing ownership structure, flows from employment in the socialized sector into private employment are a quintessential feature of the transition. Hence, we have twelve flows between still three states; however, the state of employment is subdivided into two "sub-states", employment in the socialized and private sector respectively. Figure 4.1 gives a stylized picture of the flows which occur in the Polish economy. It shows the various flows between three distinct states: employment (socialized and private), unemployment and out of the labour force. We will mainly concentrate on the flows into and out of unemployment even though knowledge about the other flows helps us understand the dynamics of unemployment. One reason for this is that there are virtually no data available about flows within the employment sector and about flows from employment to outside the labour force and vice versa.

We now derive the relationship between the present stock of unemployment and all past net flows into unemployment. Then, we analyze the composition of the flows and their determinants.

We start out with the identity

$$U_{T+1} = U_T + I_T - A_T \qquad (4.1)$$

$$I_T = I_T^o + I_T^s + I_T^p \qquad (4.2a)$$

$$A_T = A_T^o + A_T^s + A_T^p \qquad (4.2b)$$

where: U_T is the stock of open unemployment at the beginning of period T;

I_T is the total inflow into unemployment during the period;

A_T is the total outflow from unemployment during the period;

Equation (4.1) states that the stock of unemployment at the beginning of this period equals the stock at the beginning of last period plus the inflow minus the outflow during last period. Equations (4.2a) and (4.2b) describe the various components of total inflows and outflows. The inflow into unemployment during period T can be decomposed into the inflow from outside the labour force (I_T^o), from socialized (I_T^s) and private employment (I_T^p). Total outflows from unemployment also consist of 3 components with the superscripts having the same meaning as the inflow equation. The inflows and outflows of the socialized and private sector can be further decomposed by sub-sector:

$$I_T^i = \sum_{j=1}^{M} I_{Tj}^i \quad i=s,p \tag{4.3a}$$

$$A_T^i = \sum_{j=1}^{M} A_{Tj}^i \quad i=s,p \tag{4.3b}$$

where M is here the equal number of sub-sectors in the private and socialized sector.

Active labour market policies by the Polish government are considered in these decompositions. We can think of direct employment schemes by the government as one of the socialized sub-sectors, while employment connected with loans to set up one's own business or with marginal wage subsidies to private enterprises forms a sub-sector in the private sector.

Finally,

$$\begin{gathered} I_{Tj}^i = I_{Tj}^i(\mathbf{x}_{Tj}^i) \text{ and } A_{Tj}^i = A_{Tj}^i(\mathbf{y}_{Tj}^i) \\ I_T^o = I_T^o(\mathbf{x}_T^o) \text{ and } A_T^o = A_T^o(\mathbf{y}_T^o) \\ i=s,p;\ j=1,\ldots,M; \end{gathered} \tag{4.4}$$

The vectors $\mathbf{x}_j^i$ and $\mathbf{x}^o$ are vectors of inflow determinants, while $\mathbf{y}_j^i$ and $\mathbf{y}^o$ characterize outflow determinants. They can but need not have common elements. We will discuss them in detail below.

Repeatedly substituting into (4.1) gives

$$U_{T+1}=U_0+\sum_{t=1}^{T}(I_t-A_t)$$

Using (4.2), (4.3) and (4.4) and setting $U_0 = 0$ we get

$$\begin{aligned} U_{T+1}=\sum\nolimits_{t=0}^{T} [I_t^{o}(x_t^{o})+\sum\nolimits_{j=1}^{M} [I_{t,j}^{s}(x_{t,j}^{s})+I_{t,j}^{p}(x_{t,j}^{p})] \\ -A_t^{o}(y_t^{o})-\sum\nolimits_{j=1}^{M} [A_{t,j}^{s}(y_{t,j}^{s})+A_{t,j}^{p}(y_{t,j}^{p})]] \end{aligned} \tag{4.5}$$

The first term of the outer sum corresponds to flow (7) in Figure 4.1, the first inner sum to flows (3) and (5), the third term of the outer sum to flow (8) and the second inner sum to flows (4) and (6). When discussing these flows and their determinants we identify them by the numbers given in figure 1.

Flow (7) - Inflow into unemployment from outside the labour force.

This flow is composed of school leavers, people who have never worked or have not worked recently and people who work in the "parallel economy".[4] As mentioned in Annex 1, until September 1, 1990 all people who registered were eligible for benefits. After September 1, only those not working previously who had registered before were entitled to benefits until December 1, 1990. The imposition of the work requirement reduced benefit entitlements substantially. However, the large number of exceptions which are still provided for in the Law on Employment leads even now to many cases where people who never worked are entitled to benefits. One can conjecture that before the work requirement was introduced a large percentage of the unemployed were people who had no intention to work, but were just interested in benefits. For a part of those who are today exempt from the work requirement this is also true now.

Workers in the "parallel economy" should, of course, not be counted as out of the labour force and as unemployed when they go on the register. We have, however, no hard evidence about the proportion of this last group with respect to the total inflow from out of the labour force.

What determines the size of flow (7)? We can think of 4 important determinants:

a. The legal environment;

b. The overall state of the economy;

c. The emergence of markets;

d. Mismatch.

Not much needs to be said about the first determinant; suffice it to say that the legal changes restricting benefit entitlements coming into force September 1, 1990 slowed down the inflow from outside the labour force.

The overall state of the economy is most likely the most important determinant. With average real wages falling sharply in the first two months of 1990 and only recovering to 80% of the 1989 average at the end of the year (Schaffer, 1992) household incomes dropped substantially and forced secondary workers into the labour market. The recession which occurred must also have affected the "parallel economy" negatively, so some workers who work exclusively in the "parallel economy" and have lost their "parallel" jobs or are worried about their employment prospects in this unofficial sector of the economy might now be registered even though they are not entitled to benefits. Those who exclusively work in the "parallel economy" and register and therefore appear as part of flow (7) should not be many, though.[5]

We have already defined the "parallel economy" as a complementary sector of the socialized economy. With the emergence of markets and a demand constrained economy, "parallel activities" are slowly being crowded out, and the fall in employment in this unofficial sector will, if at all, appear in official statistics as increased inflow from outside the labour force.

Mismatch is an important determinant only for that part of flow (7) which is comprised of school leavers. Many school leavers have been trained in skills for which under the new economic circumstances there is little demand. This mismatch is likely to be made worse by a lack of general educational background and by very narrow vocational training.

Flows (3) and (5) - Inflows into unemployment from socialized and private sector.

We discuss these flows together as they overlap in their composition considerably. The inflow from the socialized sector is comprised of people who voluntarily quit[6], of group layoffs and individual layoffs. For group layoffs and individual layoffs in the Polish context we need not distinguish between the population of jobs and the population of the employed, a distinction which might be sensible in a Western economy (Bruni (1988)). A person flowing out of socialized employment corresponds in virtually all cases to the destruction of the job which he/she occupied. Flow (5) is composed of voluntary quits and individual layoffs - the law on group layoffs only relates to socialized enterprises.

We should also mention that the official figures understate the inflows from the private sector. We can think of two downward biases in these flows. A large proportion of family members who work in urban family enterprises are not officially employed. Upon termination of employment they are not eligible for benefits and many of them will not register as unemployed. In the rural areas of Poland surplus labour in agriculture has for many years been a major problem. After the implementation of the reform programme the ongoing recession has increased this surplus labour. Unemployed persons from the countryside commute in increasing numbers to urban centres to look for work without appearing, though, in official unemployment statistics.

One category of workers in the socialized sector needs special mentioning, namely the "peasant-workers". These are people who own some land but in their majority have to work in industry in order to earn enough income to provide for their families.[7] They are discriminated against in two ways: they are the first to go when firms dismiss workers (basically on the insistence of the workers' councils) and in their vast majority they are not entitled to benefits. The main point here is that they should appear as part of flow (3), but that if they are actually accounted for in official statistics form part of flow (12) in Figure 4.1.

So, altogether, there are in our opinion three sources for a downward bias in flows (3) and (5).[8]

The determinants of flow (3) are many and should be divided into those which speed up the inflow into unemployment and into those which counteract this speeding up of the inflow. There is a third kind of determinant which in a period of economic transition can at the margin slow down the inflow, i.e. active labour market policies. We will not discuss these policies here, however.

Determinants speeding up inflows:

a. Negative demand shocks;

b. Negative supply shocks;

c. The hardening of the budget constraint;

d. Mismatch by skill (in the long run).

We can identify 3 main sources of a negative demand shock to Polish firms in 1990 and 1991. The stabilization policy reduced consumers' income substantially, the lowering of tariffs exposed Polish firms to foreign competition and the collapse of CMEA-trade which began at the end of 1990 and gathered pace in the first quarter of 1991 caused a dramatic reduction of exports into this area. There were substantial increases over 1990 in exports to most hard currency countries in 1991 but, clearly, this increase might have been accomplished by firms which already in 1990 had successfully boosted their sales to Western countries.[9]

The imposition of a rational price system can imply dramatic price increases for essential inputs (e.g. energy and raw materials). With some real wage rigidity for those firms whose material costs rise in real terms layoffs would be unavoidable if they behaved like profit maximizing firms.

Unit labour cost can be expressed as wN/Y, where w is the real wage, N is the level of employment and Y is real output. Let $c_M M/Y$ be unit material cost, with c_M the unit material real price and M the number of units used. On average in all industries[10] real unit labour cost fell in the first two months of 1990 and reached at the end of 1990 the level of December 1989 (Schaffer, 1992). In a few sectors (especially energy) real unit material cost could have fallen if real material costs ($c_M M$) fell by more than real output. Real unit material cost could have remained constant if the numerator ($c_M M$) and denominator (Y) fell by the same amount. Whether real unit material cost has fallen or stayed constant, in both cases a fall in output could have only been caused by a demand shock.

Labour cost on average is estimated to make up a quite small proportion of total production cost. The estimates for it range from 15 to 25 per cent. Independent of this proportion, though, in those sectors where unit material cost rose by more than unit labour cost fell, a cost shock under most circumstances must have contributed to the fall in output.

One can think of different scenarios of the reaction of a monopolistically competitive profit maximizing firm to the stabilization and price liberalization[11] programme. Clearly, when we have a regime of full price liberalization an upward shift of the marginal cost schedule of an enterprise will result in a fall of equilibrium output. In the case of administered prices, however, the analysis is not quite so straightforward. The essential point with a regime of administered prices is that cost shocks need not translate into negative supply shocks. In the discussion of whether the Polish recession has mainly been due to supply or demand shocks this point has been overlooked. It is, admittedly, of minor importance and certainly not central to our flow analysis. We, therefore, relegate the elaboration of this point to Annex 2 where we analyze how a monopolistically competitive profit maximizing firm reacts under an administered price regime to cost shocks. Our analysis there shows that in the case of constant marginal cost the output decision of such a firm is independent of cost shocks and solely determined by the demand it faces, as long as it does not shut down. With rising marginal cost, a fall in demand below a certain threshold will again cause demand to alone determine the output level of such a firm.

One of the consequences of the "hardening" of the budget constraint should, in theory, be in the short run the reduction and in the long run the elimination of hidden unemployment. In practice, however, hidden unemployment was not reduced but actually increased in 1990 as overall output fell by much more than overall employment.[12]

The most important long run determinant of flow (3) is skill and regional mismatch which results from structural changes of an economy in transition to a demand constrained economy. For the period under discussion, though, mismatch by skill did not contribute much to the inflow into unemployment. Regional mismatch, however, was a problem if we use the term in the sense of Layard, Nickell and Jackman (1991), i.e. there was a wide dispersion of regional unemployment and vacancy rates. On the other hand, if we think about regional mismatch as a situation where some regions have excess supply of and other regions excess demand for labour, mismatch in this sense did not exist. In all regions there was and still is excess supply.[13]

Determinants counteracting the speeding up of flow (3):

a. The existence of worker controlled firms;

b. Tax based incomes policy (TIP, in Polish "popiwek").

Before discussing the above mentioned determinants, we need to address the question whether for state enterprises budget constraints remained somewhat "soft". At the beginning of 1990, a substantial part of all subsidies was eliminated; according to some Polish economists, however, hidden forms of subsidization of state enterprises played a role in keeping the budget constraint of these firms "soft". Firms, so their story goes, still bargained with the state about reductions of tax payments to the state budget. Even if many firms were not successful in their bargaining, some of them were e.g. able to avoid paying the "dividend" which can be thought of as a rental rate of enterprise capital payable to the state. We do not believe that there is much evidence for such a concessionary stance of the government, though. In 1990 there were hardly any loss makers among Polish state enterprises (Schaffer 1992). Since enterprises have to report their financial results monthly the ministry of finance was nearly immediately aware of this virtually universal good financial situation. It is, therefore, highly unlikely that in 1990 the government saw itself compelled to grant hidden subsidies on any discernible scale in order to avoid the feared collapse of some of the state enterprises.

Workers' councils have a powerful position in the enterprises and they may strongly influence the decisions of management. Wage policies were not completely in the domain of firm managers. Employment decisions, on the other hand, are made within the firm. Managers even if they want for cost reasons to dismiss workers are essentially told by workers' councils not to do so.

The TIP was introduced in order to avoid a wage-price spiral in the initial phase of the stabilization and price liberalization programme. Surprisingly, this incomes policy was not binding in the first 10 months.[14] This phenomenon is somewhat an economic puzzle - if we take into account the powerful position of workers' councils.

There exist various attempts to explain why wages did not rise for most of 1990 by as much as they could have. Some authors presume that the actions of workers' councils showed the rational behaviour of agents in a market economy: they were restrained in their wage demands because they were afraid to lose their employment in the face of adverse economic conditions.[15] Alternatively, this phenomenon can be explained by a lag in workers' adjustment to the new economic environment. Many factors may have contributed to this lagged adjustment. Besides the factor of voluntary wage restraint mentioned above, one can among others think of 2 reasons. First, workers' interests could and can in theory be represented by the trade union "Solidarity" or by "OPZZ".[16] "Solidarity" could not immediately oppose a government which in its entirety had come from its own ranks, while "OPZZ" as a force associated with the previous government was at the beginning of 1990 politically impeded. So, at least in the initial phase of the reform programme, workers had no organization which exclusively represented their interests. Secondly, in the absence of well defined wage bargaining mechanisms, workers had to learn how to exert wage pressure.[17]

Furthermore, one should avoid a too direct application of the neo-classical theory to the behaviour of large firms in the post-command economy. These firms in such an economy might show a quite different responsiveness to wage changes from firms in a market economy. The absence of capital markets in the Polish economy can imply a very inelastic demand for labour as there is no opportunity cost of using retained earnings in production.

From November 1990, the TIP has been binding and become one of the most important tools of keeping wages down, hence, counteracting the speeding up of flow (3).

The movement of wages can only partially explain why the huge fall in output was not transformed into large outflows from socialized employment. In a developed market economy such a transformation would have taken place because once wages have been bargained over employment decisions are unilaterally made by management (cf e.g. Layard et al., 1991). Polish managers in state enterprises have been much too weak to make employment decisions by themselves, workers' councils until now seem to have had an important, if not the final say when it comes to firing employees. Actually, in many cases workers' councils removed firm directors.[18]

The determinants of flow (5) are:

a. Overall state of the economy and market conditions;

b. "Hardening" of budget constraint for socialized enterprises.

The first determinant is very straightforward. Private firms have always been demand constrained. Aggregate demand fell dramatically in 1990. Furthermore, input prices rose considerably. In 1990 the TIP did apply to private firms and might have determined movements of private firm wages. Since the beginning of 1991 the TIP does not apply for these firms, so wages since then are entirely determined inside the firm. In understanding the latter wage determination process one should keep in mind that workers have a weak bargaining position in these firms. Nevertheless, it is conceivable that real wages have not been flexible enough downward to fall to the level necessary to offset the rise in real input prices. Furthermore, there are private firms which have difficulties in adjusting to changing market conditions. Such firms will close down or lay off workers. The crucial point is that, no matter how a reduction in the output of a private firm comes about, this reduction will be directly translated into a fall in employment. The amount of private labour shed should in the present Polish situation only be a function of technology and not also of some long-run profit maximization strategies.[19]

In the past, private firms could easily gain from wasteful operations by the state economy. Socialized firms could with impunity waste money and resources. The entire existence of some private firms was based on the utilisation of this situation, e.g. they bought inputs at low prices or received them gratuitously and sold their output at high prices. With the "hardening" of the budget constraint managers in socialized firms had to care about their finances. As a consequence of this some of these private firms folded. This "hardening" of the budget constraint also affected many other private firms which had only partially benefitted from the wasteful behaviour of state firm management.

Flow (8) - Outflow from unemployment out of the labour force

The largest part of this outflow consists of people who had registered before the change of the law which took place in 1990. As of December 1, 1990 they lost their eligibility for benefits and most of them do not believe that they can find jobs through labour offices. In the already mentioned survey only approximately 20 % of dismissed unemployed believed in the effectiveness of search through labour offices. Another group are discouraged workers, although we think that in 1990 it was negligibly small. Thirdly, people who retired while being unemployed made up part of this flow. Since people had the option to choose early retirement while still employed, this third group was very small as well in 1990.

The main determinant of flow (8) was definitely the changing legal environment. If, however, in the future the overall state of the economy will be depressed for long periods of time and this will result in the lengthening of unemployment spells we could see a sharp rise in discouraged workers (especially with benefits cut off after 12 months), thus boosting flow (8).[20]

Flow (4) - Outflow from unemployment into socialized sector

Clearly in the first 18 months after the "big bang" inflows into unemployment from the socialized sector were greater than outflows into this sector. This does not mean, however, that these outflows were negligible. There is evidence that in 1990 all sub-sectors hired substantial numbers of workers (Błaszkiewicz, 1990 and Mały Rocznik Statystyczny, 1991, section X). The sub-sector Communications and some other services actually had positive inflows into employment in 1990.

Since the socialized sector will for a long time make up the bulk of the economy, increased outflows into the socialized sector will arise with positive supply and demand shocks.

Firms have started to be more careful in their hiring decisions. This implies that the mechanisms which are in operation in Western labour markets might start to work in Poland as well. So, workers with long unemployment spells and/or with low qualifications will have a low search effectiveness and might not be hired even in the socialized sector.

Flow (6) - Outflow from unemployment into private sector

The private sector is something of a "black box" in Poland. Data about it are not reliable if available at all. However, we can say with certainty that within private enterprises owner-managers experience few institutional constraints in their actions. Given this fact, we think that the neo-classical theory of the firm mirrors reasonably well the behaviour of Polish firms in the private sector.

There exists some evidence suggesting that wages in private firms are higher but not much higher than in the socialised sector (see Tulski and Woźniakowski (1990)). This can be given as one reason why private sector managers are able to be quite choosy in their hiring decision. Consequently, not many unemployed are likely to be hired by this sector and most of the hiring should take place through flow (1).[21]

Virtually all socialized enterprises after privatization will shed labour and only keep on part of the staff. It is highly unlikely, therefore, that these firms will hire people from the unemployment pool in the foreseeable future. The speed at which new private firms can be formed is, in our opinion, by far the most important determinant of this flow. The higher investment rates from domestic and foreign sources are, the greater this speed. It is hard to see how domestic investment rates can become large in the near future given the low levels of domestic savings. On the other hand, foreign investment figures for 1990 and 1991 are not very encouraging either.[22] So we would argue that this flow will, in the absence of large scale marginal wage subsidies which target the unemployed, stay very small.[23]

III Analysis of Unemployment and Vacancy Stocks

We first give the composition of the stock of unemployment on the basis of data for May 31, 1991[24]. We do not have data on quits and the people who are exempted from the previous work requirement. The above quoted case study on dismissed workers suggests that about 10% of these workers quit voluntarily. Unfortunately we have no way of estimating the proportion of the unemployed who receive benefits and are exempted from the previous work requirement. Setting the number of these people equal to Z we arrive at the following composition of the stock of unemployed which we think is more or less representative:

Total Stock:	1434508
From Employment	
Group Layoffs:	286161
Quits:	74379 - 0.1*Z
Individual Layoffs:	669406 - 0.9*Z
From Outside the Labour Force	
School Leavers:	134489
Not Entitled to Benefits:	270073
Entitled to Benefits w/o Work Requirement:	Z

For the period in question the elements given in this table varied. On the dynamics of some of them we have some evidence.

In Figure 4.2 we see how the total stock of unemployment evolved over the period. The monthly increases varied but over the whole period we have a virtually linear upward trend. The variations in the monthly increases can to some extent be explained by the dynamics of the stock of school leavers and of group layoffs and the change of the legal environment as well.

At the beginning of December, 1990 the new regulations concerning benefits began to have an dampening impact on the stock of unemployment by causing for the first time relatively large outflows from unemployment out of the labour force (flow (8) in Figure 4.1).

Group layoffs (Figure 4.3) were rising very slowly at the beginning of the year. From April until the end of 1990 they rose steadily at a faster rate than the total stock of unemployment (Figures 4.4 and 4.5). At the beginning of 1991 this rise accelerated but slowed down again from February on. This acceleration for the month of January 1991, therefore, does not hint at the beginning of some structural change. At any rate, the proportion of group layoffs in the total stock of unemployment still remains at a relatively low level, namely 20.0% at the end of the reported period (June 31,1991).

The other apparent influence on the trend of total unemployment is the stock of school leavers (Figure 4.6). They started to enter the labour force in July 1990, the evidence, however, is available from August. There was a big inflow of school leavers into unemployment in July and August, with the curve flattening out for the rest of the year. At the end of 1990 about 28% of the whole stock of school leavers remained unemployed. For the first three months of 1991, the monthly overall outflow rates from unemployment[25] were extremely low and have only increased slightly for the months of April and May. If such low overall outflow rates continue for this and the 1991 cohort, a serious build-up of long-term unemployment among school leavers will take place. From October 1990 to May 1991, only 18.4% of the unemployed school leavers were able to "escape" from unemployment. In June 1991 we see the first inflows into unemployment from the 1991 cohort of school leavers.

It might be of some interest to look at the development of unemployment without school leavers (Figure 4.7), without group layoffs (Figure 4.8) and without both groups (Figure 4.9).

We now turn to vacancies (Figure 4.10). With the Employment Act from December 29, 1989[26] enterprises are no longer required to report vacancies as they were in the past. However, the dramatic drop (from 254,500 in December 1989 to 20,100 in February 1990) cannot be attributed to this change in the law, but must reflect a sharp fall in labour demand. Until the end of October 1990 vacancies steadily rose from this level up to 64,000. After that date a consecutive sharp decline occurred for the next four months with only a slight recovery in March and April of 1991. This secular fall in vacancies over the last eight months can be explained by competing stories. For example, it could come from a further fall in demand or from increased matching effectiveness in the labour market.

In Figure 4.11 we show the overall U/V ratio and ratios for men and women separately.[27] There are two interesting phenomena. The overall ratio steadily rose from close to zero in January 1990 to 33 in June 1991. This for one clearly shows the switch from an excess demand to an excess supply regime in the labour market, but it also shows the persistence of the excess supply regime. The other phenomenon worth noting are the much higher levels for the female ratio. This could reflect a substantial fall in the demand for female labour, which seems to be a phenomenon not unique to the Polish transition.[28] At least in the medium run this fall in demand could reverse the former trend of very high female participation rates.

In Table 4.2 we give a breakdown of employment by sub-sectors and its long and short run trends. The information contained there should allow us to say something about the likely sources of that part of unemployment which originates in the employment sector. We should point out that employment fell throughout the eighties and that in 1990 the trend of the previous decade was only accelerated. Our main point, however, is that in 1990 employment in the non-budgetary sub-sectors of the socialized economy fell quite evenly. This seems to indicate that demand and supply shocks experienced across the socialized sector have been mainly responsible for this fall in employment.

IV Conclusions

The two most important conclusions which we can draw from our analysis can be summarized as follows. In the discussed period, demand and supply shocks were experienced across the socialized sector and have been mainly responsible for the rise in unemployment, while restructuring, on the other hand, has not been an important source of unemployment. Unemployment can, therefore, be expected to rise to much higher levels in the near future <u>if</u> restructuring gets under way in earnest.

The analysis of Polish unemployment presented in this chapter utilizes all published and unpublished data available. Clearly, the paucity of the data makes it impossible to give a full picture of the processes having taken place in the Polish labour market the first 18 months after the beginning of the reforms. Nevertheless, we believe that combining the analysis of existing stock data with a qualitative analysis of flows into and out of unemployment does shed some additional light on the situation in the Polish labour market in its first stage of transition.

Footnotes

* This chapter is a revised version of an article co-written with Marek Góra which appeared as Góra and Lehmann (1992).

1. In Western economies the observed quarterly flows are larger than annual flows due to "re-tripping" (Bruni (1989)). We conjecture, though, that in the initial stage of transition there is virtually no "re-tripping". Consequently, if for the reported period we could observe flows, the shorter the time interval the smaller the number of people changing states.

2. For a description of this environment and its changes in the period January 1990-June 1991 see Appendix 1.

3. A recent discussion of gross flows in the US labour market and their relation to stocks in the three states can be found in Blanchard and Diamond (1990).

4. The term "parallel economy" is not synonymous with the private economy as it is shown in official statistics. The "parallel economy" should be understood as a complementary sector of the economy, complementary to the socialized sector which in the past had no incentive to produce goods which were in high demand.

5. For a theoretical discussion of peculiar features of labour supply in an economy of transition see Góra (1991a).

6. There are no aggregate data on voluntary quits. In a not very representative survey 9.8% of the unemployed had quit voluntarily (Społeczne, 1991).

7. The number of people belonging to this category is approximately 2 million.

8. One should stress here that even large biases do not make our flow analysis problematic. Flow analysis becomes questionable when the behaviour of a large part of the pool of the unemployed and of people who are out of the labour force coincide and when "re-tripping" occurs between different labour market states during the time interval chosen for the analysis (Cf. Clark and Summers, 1979). The fact that e.g. persons belonging to agricultural surplus labour are officially not accounted for as unemployed job-seekers is irrelevant to our qualitative analysis of flows in the Polish labour market. What alone matters is that these persons behave exactly like all those officially registered unemployed who are without work and are actively seeking a job, i.e. that they behave no differently from those who are legitimately on the register.

9. For the first quarter of 1991 exports reached the following percentage levels of the first quarter of 1990: For Bulgaria 28,5; Czechoslovakia 87,7; Yugoslavia 32,5; USSR 64,5; Rumania 38,1; Hungary 109,5. The corresponding figures for the most important hard currency countries were: FRG 142,1; France 125,5; Britain 106,9; Austria 134; Switzerland 164,1 (see Biuletyn Statystyczny, 4, Table 53, GUS, 1991).

10. We cannot talk about the economy as a whole since official statistics do no provide full information on services.

11. According to government sources, the prices of 90 per cent of commodities and services have been fully liberalized. However, the prices of some commodities and services (e.g. energy and housing) which have a large weight in a representative consumer's market basket remain under state control. Though prices of such commodities and services have been set at much higher levels than before January 1990, they still did not reach market clearing levels (at least not before the fall in demand).

12. For more details see Góra (1991b).

13. A discussion of regional disparities of U/V ratios in Poland covering the same period can be found in Lehmann et al. (1991).

14. During the first six months wages were below the norm, during the consecutive four months enterprises utilised the accumulated "credit" resulting from lower (below the norm) wages in the first half of the year.

15. See Rutkowski (1991) and Schaffer (1991).

16. The latter was the trade union established after the imposition of martial law.

17. At the beginning of 1990, strikes were not a means to exert wage pressure as workers would have struck against their "own government".

18. Detailed research of the inner institutional workings of Polish firms is need to gain a fuller picture of Polish industrial relations.

19. In the initial phase of transition it is highly unlikely that private Polish firms which are not family enterprises hoard labour during a contraction as some Western firms do to minimize long-run cost.

20. In the first months of 1991, as unemployment benefits were still open-ended, flows from unemployment into the state "out of the labour force" should have been minuscule.

21. One should note that it is possible to flow from socialized to private employment without changing the workplace. This occurs for those workers who have been kept on after their firm has been privatized.

22. An official government report states that direct foreign investment has so far been rather small. Most of foreign investment has occurred in the form of small joint ventures with foreign capital of $373,8m committed. (See Rada Ministrów, 1991.)

23. For a thorough discussion of the role of labour market policies in the Polish context see Lehmann (1991).

24. We choose this date rather than 30 June 1991 as this is the last data point before the 1991 cohort of school leavers starts to enter the labour force.

25. We can think of this rate as an estimate of a person's average exit probability during next month if this person finds him/herself in the pool of unemployed school leavers at the beginning of the month.

26. For the source of the Employment Act see Appendix 1.

27. Until the end of 1991 Polish statistics give vacancies separately for men and women.

28. In the Ex-GDR there is ample casual evidence of the "crowding out" of female labour. See also the evidence on this point in Chapter 5.

Appendix 1

Unemployment Legislation through June 1991

In 1989 and 1990 12 legislative acts were passed which concern unemployment and the labour market. Three of them bear especially upon our analysis: The Employment Act (passed and becoming law on 29.12.1989), the Act on Group Layoffs (passed and becoming law on 28.12.1989) and the Act on the Change of the Employment Act (passed on 27.07.1990 and becoming law on 1.09.1990).

At the beginning of 1991, the Minister of Labour and Social Policy presented the 'Project on the Change of the Employment Act' to the Sejm. The project foreseeing a few important revisions in the up to then existing legislation, especially concerning unemployment benefits, was passed by the Sejm after July 1991. In this annex we do not take these revisions into account and the description of the unemployment legislation presented here is based on the legal regulations being in force as of July 1, 1991.

According to the Employment Act, a person is unemployed if he/she fulfils 7 criteria, namely: (a) is able to work, (b) is ready to work, (c) is out of work, (d) is registered at a local employment office, (e) does not receive a pension, (f) does not own his/her own business, (g) does not own his/her own farm with an area of more than 1 ha.

Eligibility criteria for unemployment benefits are as follows. An unemployed person is eligible for benefits if: (a) he/she has no offer of an adequate job, i.e. a job commensurate with education and skills and within relatively easy commuting distance, (b) there is no training or retraining offer, (c) there is no offer of a place on community public works and (d) he/she has worked at least 180 days over the last 12 months. Regulation (d) became law on September 1, 1990. However, people who had not worked but registered before this date could draw benefits until November 30, 1990. Even after September 1, 1990, though, many unemployed are exempted from the work requirement of regulation (d). So, still many people who never worked are entitled to benefits.

Unemployment benefits are paid as a percentage of the individual's previous wage in the case of prior employment and as a multiple of the minimum wage in the case of new entrants to the labour market. Previously employed claimants receive 70% of previous pay for the first 3 months, 50% for the next 6 months, and 40% - after 9 months. However, people who have become unemployed as a result of group layoffs are entitled to 75% of their previous pay, if they are older than 55 years (women) or 60 years (men). School leavers receive benefits which vary with the level of education of the individual and the duration of unemployment (from 95% to 125% of the minimum wage). Other unemployed eligible for benefits receive 95% of the minimum wage. Benefits are not indexed, but minimum and maximum benefit levels are explicitly set at 95% of the minimum wage and the average wage, respectively.

Until the 'Project on the Change of the Employment Act' was passed by the Sejm benefits were open ended. After the newest novelization of the Act on Employment benefits are limited to 12 months.

Finally, we want to summarize the two main points of the Act on Group Layoffs. It applies to firms which: (a) over a span of 3 months shed at least 10% of their labour force (firms with less than 1000 workers) or at least 100 workers (firms with more than 1000 workers), (b) go bankrupt, and (c) are liquidated.

The act establishes a formula for redundancy pay. Redundancy pay which is borne by firms amounts to one monthly wage if the employee has worked in total for less than 10 years, to two monthly wages for total work experience between 10 and 19 years and to three monthly wages for tenure exceeding 19 years.

Source: Ministry of Labour and Social Policy (January 1991).

Appendix 2

Cost shocks in an administered price regime

Here we describe the reaction of a monopolistically competitive profit maximizing firm in an administered price regime. We look at the two cases of constant and rising marginal cost. When marginal cost is constant throughout the relevant output range the upward shift of marginal cost will not contribute to the reduction in output. Figure 4.A1a demonstrates this point. Marginal cost is here equal to average variable cost, so as long as marginal cost is below the administered price, a profit maximizing firm will produce in the short-run. The profit maximizing level of output is in this case completely demand determined. Let us represent the demand to the firm by D_1. Consumers at the administered price P_a are then willing to buy Q_1, consequently, at marginal cost MC_1 the firm maximizes profits with output Q_1.[1] As long as demand does not fall the equilibrium output will remain Q_1 even if marginal cost rises to MC_2.

A monopolistically competitive firm in an administered price regime with a rising marginal cost schedule takes its profit maximizing output decision like a perfectly competitive firm, i.e. it produces where its marginal cost equals price. On the other hand, though, unlike the perfectly competitive firm it faces a downward sloping demand curve and cannot sell any quantity it likes at the administered price. So, as long as marginal cost intersects the administered price to the left of the demand curve (e.g. at Q_1 with demand being represented by D_1 in Figure 4.A1b), the output decision is made by the firm. Putting it more generally, if as in Figure 4.A1b we have a fall in demand and a rise in marginal cost, the cost shock will only have a bearing on the new equilibrium level of output if the fall in demand is not too dramatic. If demand falls from D_1 to D_2 and marginal cost rises to MC_2 the new equilibrium level of output (Q_2) is determined by the intersection of the new higher marginal cost and the administered price. Demand constrains the new equilibrium level of output, however, if demand falls from D_1 to D_3.

[1]With constant marginal, i.e. constant average variable cost, we can neglect the presence of fixed cost as average cost is continually declining in the relevant range.

Table 4.1
Data on unemployment and vacancies: Poland January 1990 - June 1991

Month	Unempl. '000	Unempl. rate (%)	Group Layoffs '000	Group Layoffs (as % of U)	U/V Total	U/V Male	U/V Female	Vacancies '000	School Leavers '000
			1	9	9	0			
JAN	55.8	0.3	2.4	4.3	2	1	3	35.2	-
FEBR	152.2	0.8	6.8	4.5	8	6	14	20.1	-
MARCH	266.6	1.5	15.2	5.7	11	8	24	24.1	-
APRIL	351.1	1.9	27.4	7.8	11	8	23	31.7	-
MAY	443.2	2.4	42.1	9.5	12	8	23	37.8	-
JUNE	568.2	3.1	58.0	10.2	13	9	30	42.5	-
JULY	699.3	3.8	79.0	11.3	15	9	36	47.7	-
AUG	820.3	4.5	100.9	12.3	14	9	33	57.3	124.2
SEPT	926.4	5.0	126.0	13.6	15	9	37	61.0	157.4
OCT	1008.0	5.5	147.2	14.6	16	9	45	64.0	164.9
NOV	1089.0	5.9	165.7	15.2	19	13	41	56.1	164.8
DEC	1124.0	6.1	183.2	16.3	21	14	40	54.0	164.3
			1	9	9	1			
JAN	1195.7	6.6	218.8	18.3	26	18	46	45.3	158.4
FEBR	1258.9	6.8	236.7	18.8	30	20	53	42.2	156.1
MARCH	1322.1	7.1	250.5	18.9	29	19	56	45.8	153.4
APRIL	1370.1	7.3	268.9	19.6	27	18	57	49.9	145.2
MAY	1434.5	7.7	286.2	19.9	31	19	66	47.0	134.5
JUNE	1574.1	8.4	315.3	20.0	33	21	74	47.4	144.2

Source: "Informacja Sygnalna" (twice monthly), Ministry of Labour and Social Policy.
Informacja Statystyczna" (monthly), GUS.

Notice: Unemployment and vacancies are recorded at the end of the month.

Table 4.2
Employment in the Polish economy*

SECTORS	1980 EMPLOYM. thousands	1989 EMPLOYM. thousands	1990 EMPLOYM. thousands	1990 EMPL. GROWTH from 1980	1990 EMPL. GROWTH from 1989
TOTAL	17333.7	17129.8	16501.3	-4.8%	-3.7%
Socialized Sector	12717.9	12054.6	10927.9	-14.1%	-9.3%
Private Sector	4615.8	5075.2	5573.4	20.7%	9.8%
NON-AGRICULT. PRIVATE SECTOR	611.7	1515.2	2004.2	227.6%	32.3%
MANUFACTURING & MINING	5244.9	4894.3	4610.6	-12.1%	-5.8%
Socialized Sector	4973.2	4176.9	3755.6	-24.5%	-10.1%
Private Sector	271.7	717.4	855.0	214.7%	19.2%
CONSTRUCTION	1336.6	1318.3	1242.0	-7.1%	-5.8%
Socialized Sector	1234.2	963.8	829.7	-32.8%	-13.9%
Private Sector	102.4	354.5	412.3	302.6%	16.3%
AGRICULTURE	5143.1	4522.9	4424.8	-14.0%	-2.2%
Socialized Sector	1139.0	962.9	855.6	-24.9%	-11.1%
Private Sector	4004.1	3560.0	3569.2	-10.9%	0.3%
FORESTRY	164.0	148.5	134.0	-18.3%	-9.8%
Socialized Sector	155.0	140.0	125.4	-19.1%	-10.4%
Private Sector	9.0	8.5	8.6	-4.4%	1.2%
TRANSPORT	959.0	810.3	761.5	-20.6%	-6.0%
Socialized Sector	948.2	765.0	695.8	-26.6%	-9.0%
Private Sector	10.8	45.3	65.7	508.3%	45.0%
COMMUNICATIONS	160.3	168.3	170.6	6.4%	1.4%
Socialized Sector	160.3	168.1	170.3	6.2%	1.3%
Private Sector	-	0.1	0.3	-	200.0%
TRADE	1304.7	1458.7	1388.5	6.4%	-4.8%
Socialized Sector	1259.0	1341.7	1073.0	-12.6%	-18.0%
Private Sector	45.7	117.0	315.5	590.4%	169.7%
PUBLIC UTILITIES	401.3	432.2	427.4	6.5%	-1.1%
Socialized Sector	328.8	321.1	308.3	-6.2%	-4.0%
Private Sector	72.5	111.1	119.1	64.3%	7.2%
HOUSING	200.4	210.0	199.3	-0.5%	-5.1%
Socialized Sector	197.2	208.4	197.7	0.3%	-5.1%
Private Sector	3.2	1.6	1.6	-50.0%	0.0%
RES. & DEVELOP.	148.5	112.1	97.6	-34.3%	-12.9%
Socialized Sector	148.5	112.1	96.2	-35.2%	-14.2%
Private Sector	-	-	1.4	-	-
EDUCATION	747.4	1077.7	1100.6	47.3%	2.1%
Socialized Sector	747.4	1077.1	1096.8	46.7%	1.8%
Private Sector	-	0.6	3.8	-	533.3%

Table 4.2 (continued)
Employment in the Polish economy*

SECTORS	1980 EMPLOYM. thousands	1989 EMPLOYM. thousands	1990 EMPLOYM. thousands	1990 EMPL. GROWTH from 1980	1990 EMPL. GROWTH from 1989
CULTURE & ARTS	82.7	124.4	119.4	44.4%	-4.0%
Socialized Sector	82.3	116.9	108.4	31.7%	-7.3%
Private Sector	0.4	7.5	11.0	2650.0%	46.7%
HEALTH CARE & SOC. WELFARE	598.7	872.2	901.3	50.5%	3.3%
Socialized Sector	598.7	869.2	892.9	49.1%	2.7%
Private Sector	-	3.0	8.4	-	180.0%
SPORT, TOURISM & RECREATION	103.8	132.3	112.7	8.6%	-14.8%
Socialized Sector	103.2	121.3	94.6	-8.3%	-22.0%
Private Sector	0.6	11.0	18.1	2916.7%	64.5%
PUBLIC ADMINISTR. & JUSTICE	227.4	260.7	259.7	14.2%	-0.4%
Socialized Sector	227.4	260.7	258.5	13.7%	-0.8%
Private Sector	-	-	1.2	-	-
FINANCE & INSURAN.	157.1	172.4	181.3	15.4%	5.2%
Socialized Sector	157.1	172.4	179.5	14.3%	4.1%
Private Sector	-	-	1.8	-	-
MATERIAL SPHERE	14828.3	13885.9	13296.4	-10.3%	-4.2%
NON-MATER.SPHERE	2505.4	3243.9	3204.9	27.9%	-1.2%

* Yearly averages.

Source: "Rocznik Statystyczny 1990", GUS, Warszawa.
Unpublished data provided by GUS. Own calculations.

Figure 4.1

Labour Flows in an Economy in Transition

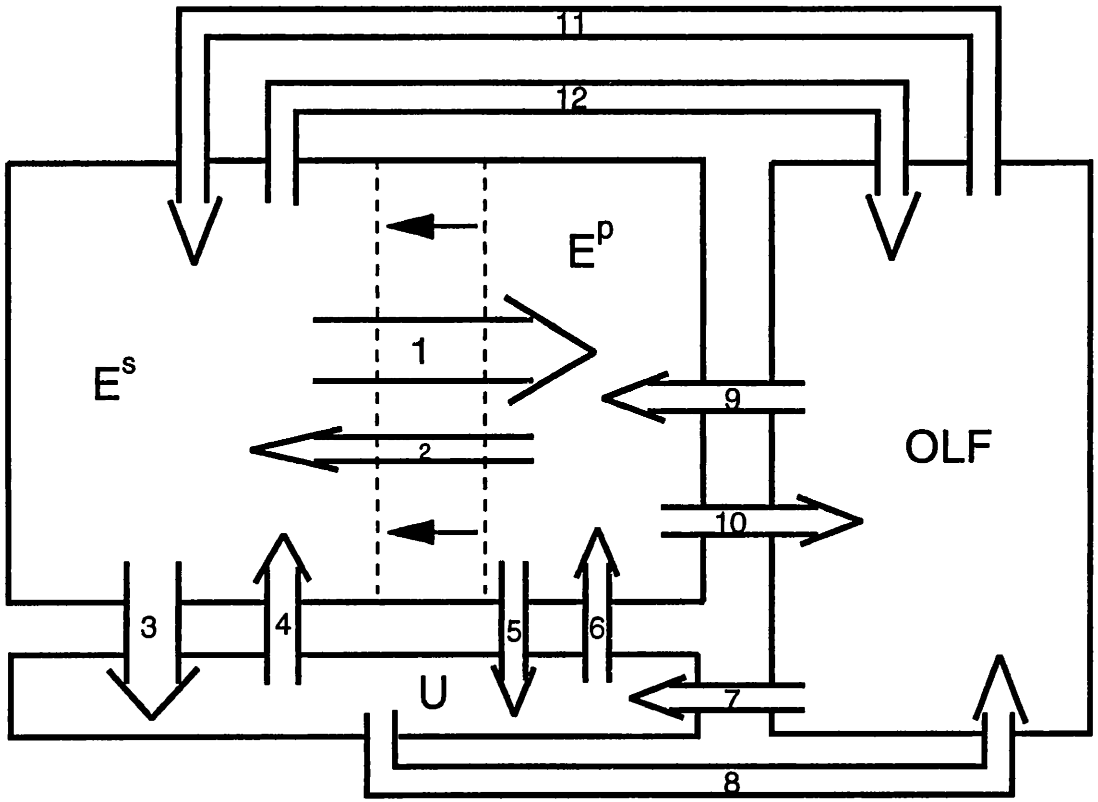


Figure 4.1 (continued)

Explanations

We have 3 general states: employment (E), open unemployment (U) and "out of the labour force" (OLF). Any economy (and certainly an economy in transition) does not have constant stocks, but in our figure this is assumed for expositional ease.

There are the following stocks:

E^s = employment in socialized sector, including employment on government schemes.

E^p = employment in private sector, including employment resulting from schemes which help unemployed persons to set up their own business.

The leftward moving broken line represents growing private sector employment in a constant pool of employed.

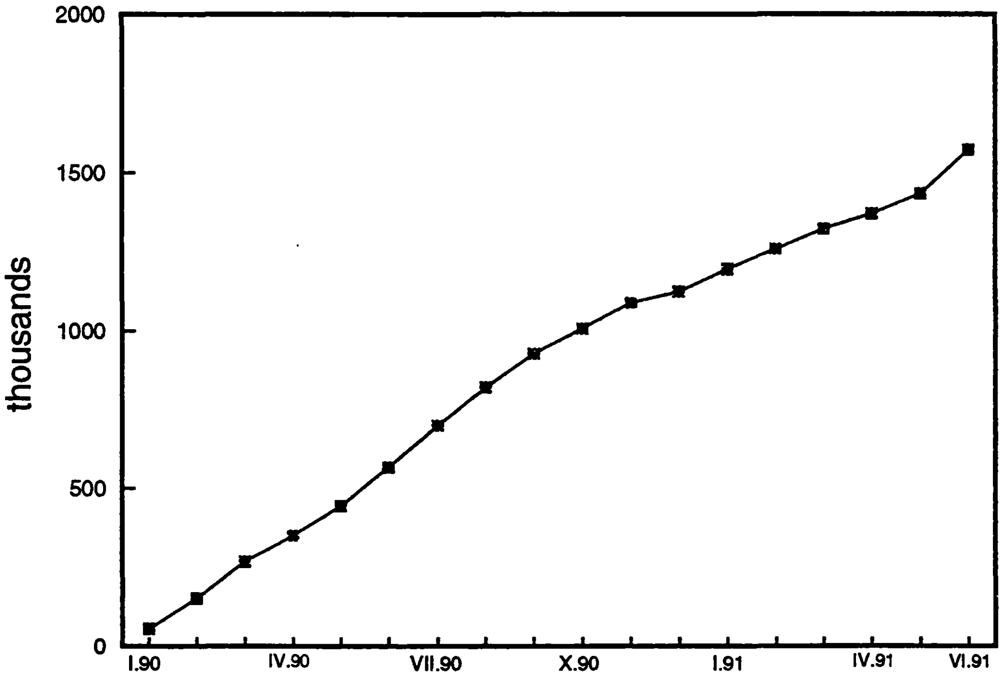
U = Open Unemployment; OLF = Out of the Labour Force.

We have the following 12 flows:

(1) : Transition from socialized to private sector.
(2) : Transition from private to socialized sector.
(3) : Inflow into unemployment from socialized sector.
(4) : Outflow from unemployment into socialized sector.
(5) : Inflow into unemployment from private sector.
(6) : Outflow from unemployment into private sector.
(7) : Inflow into unemployment from outside the labour force.
(8) : Outflow from unemployment out of the labour force.
(9) : Inflow into private employment from outside the labour force.
(10): Outflow from private employment out of the labour force.
(11): Inflow into socialized employment from outside the labour force.
(12): Outflow from socialized employment out of the labour force.

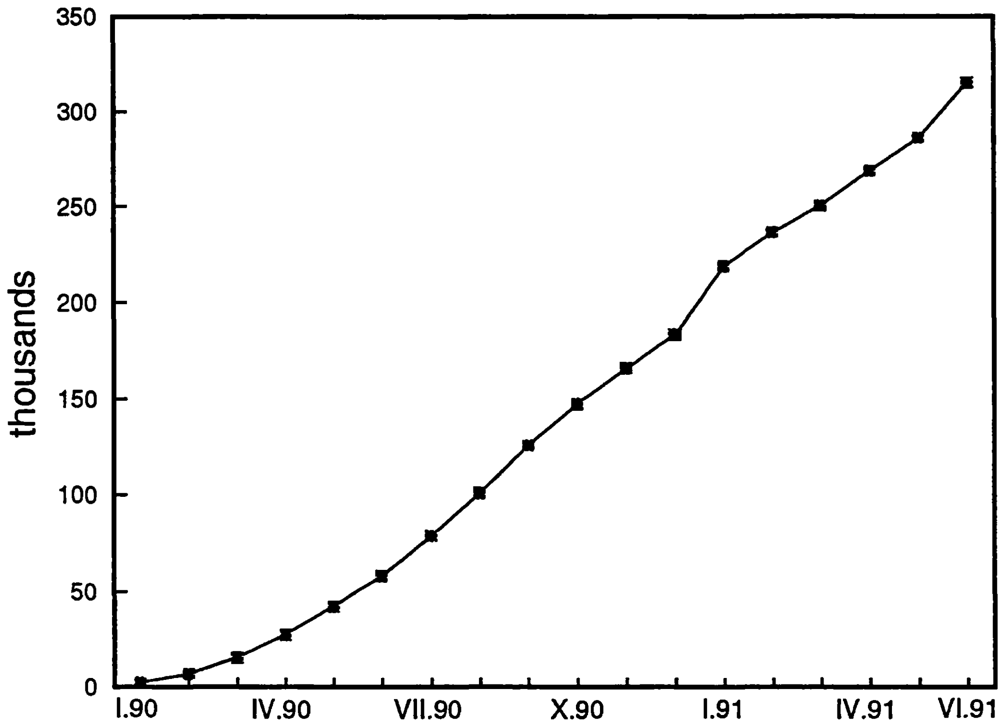
Figure 4.1 shows an already large private sector. It in so far reflects an economy like the Polish one where throughout the eighties the private sector was quite large and growing. See Table 4.2.

Figure 4.2 - Total unemployment : Poland (Jan 90 - June 91)



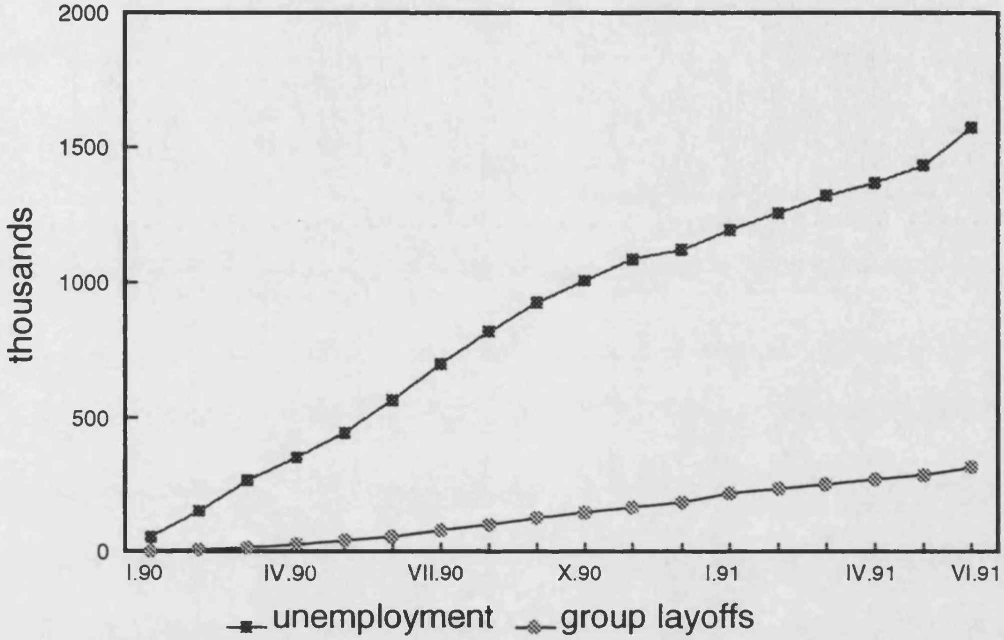
Source: GUS.

Figure 4.3 - Group layoffs : Poland (Jan 90 - June 91)



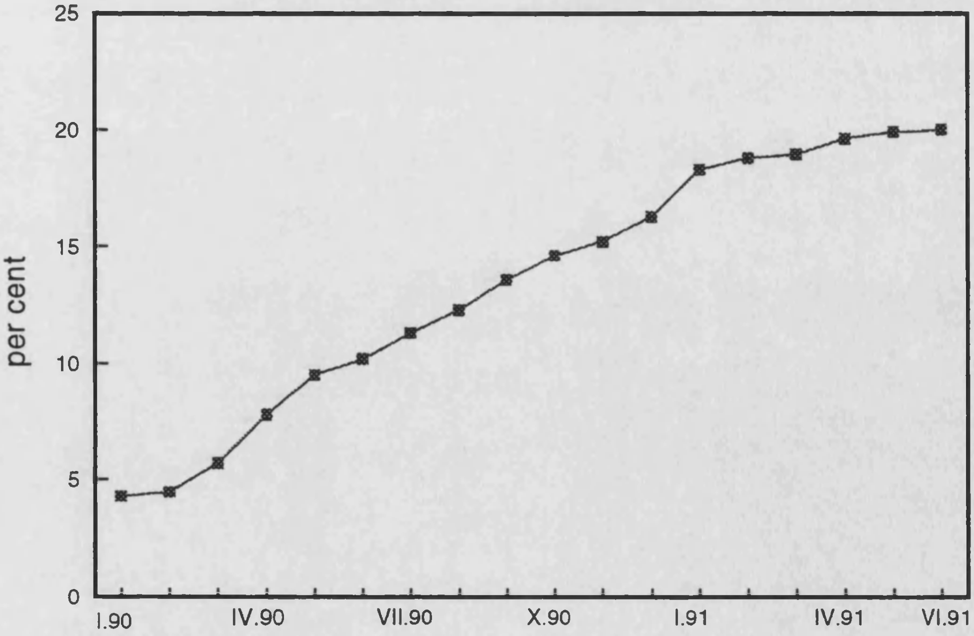
Source: GUS.

Figure 4.4 - Total Unemployment and group layoffs
Poland (Jan 90 - June 91)



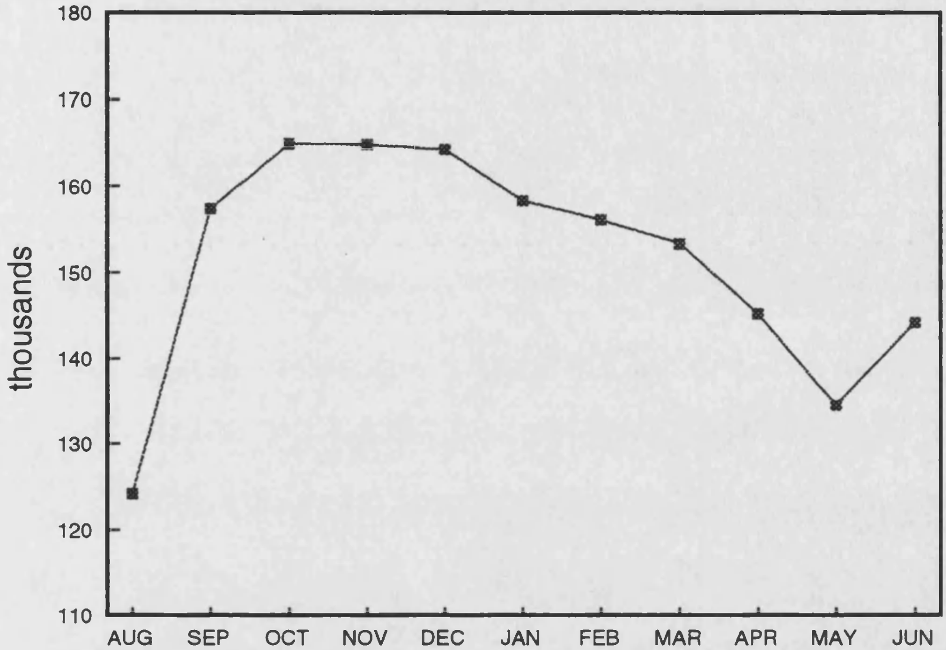
Source: GUS.

Figure 4.5 - Group layoffs as a percentage of unemployment
Poland (Jan 90 - June 91)



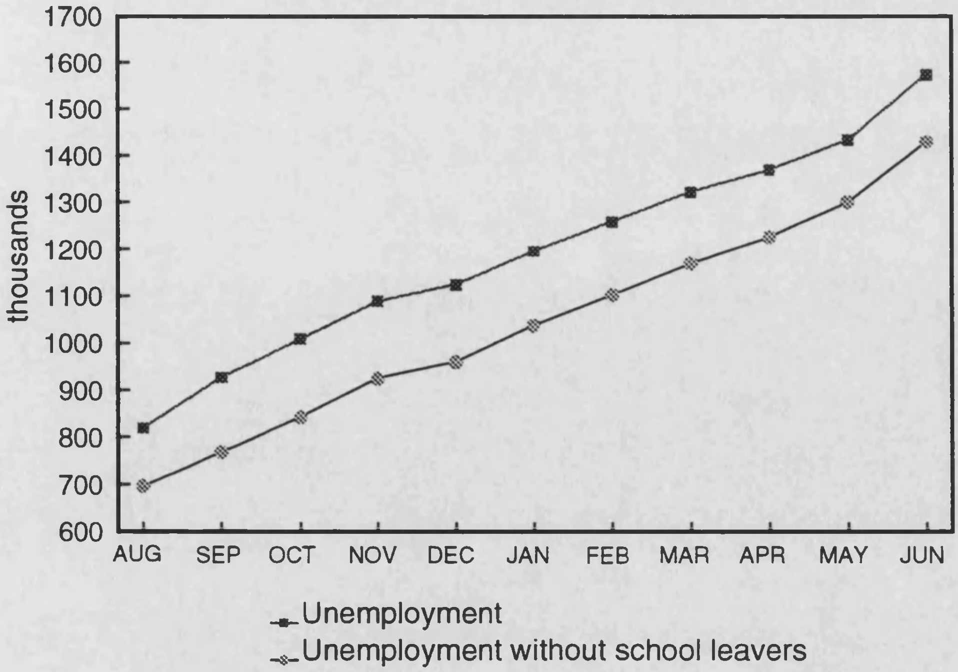
Source: GUS.

Figure 4.6 - Unemployed school leavers - Poland (Aug 90 -June 91)



Source: GUS.

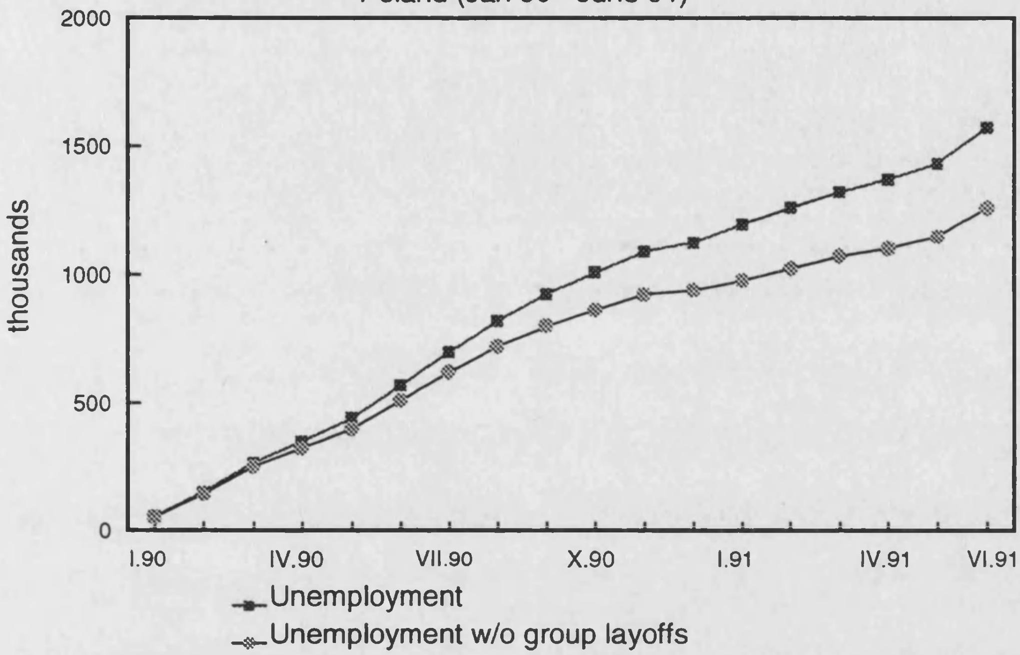
Figure 4.7 - Unemployment and unemployment w/o school leavers
Poland (Aug 90 - June 91)



Data on unemployed school leavers not available for June and July 1990.

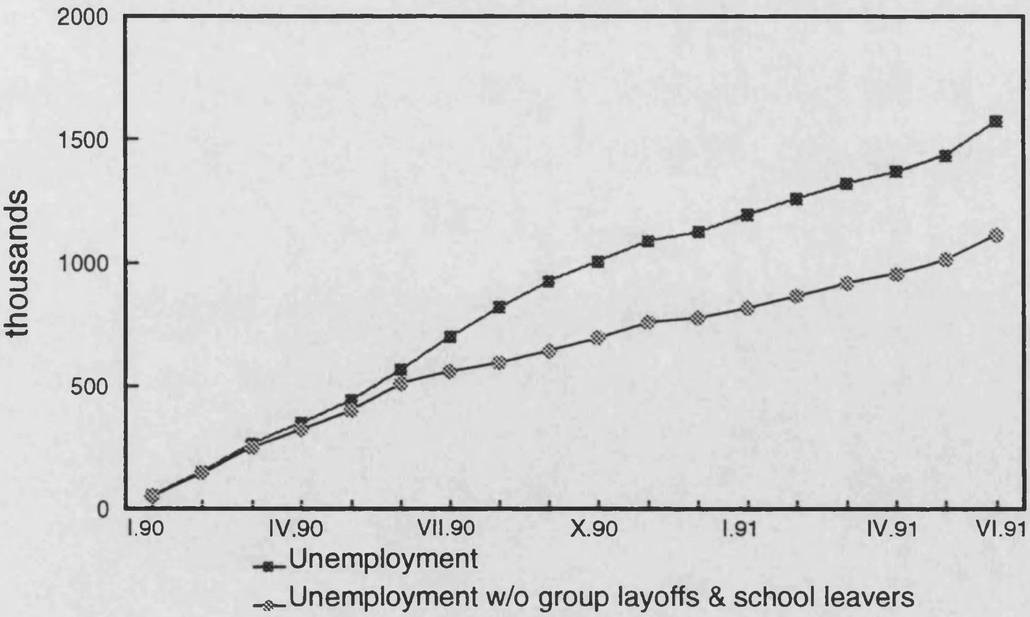
Source: GUS.

Figure 4.8 - Unemployment and Unemployment without group layoffs
Poland (Jan 90 - June 91)



Source: GUS.

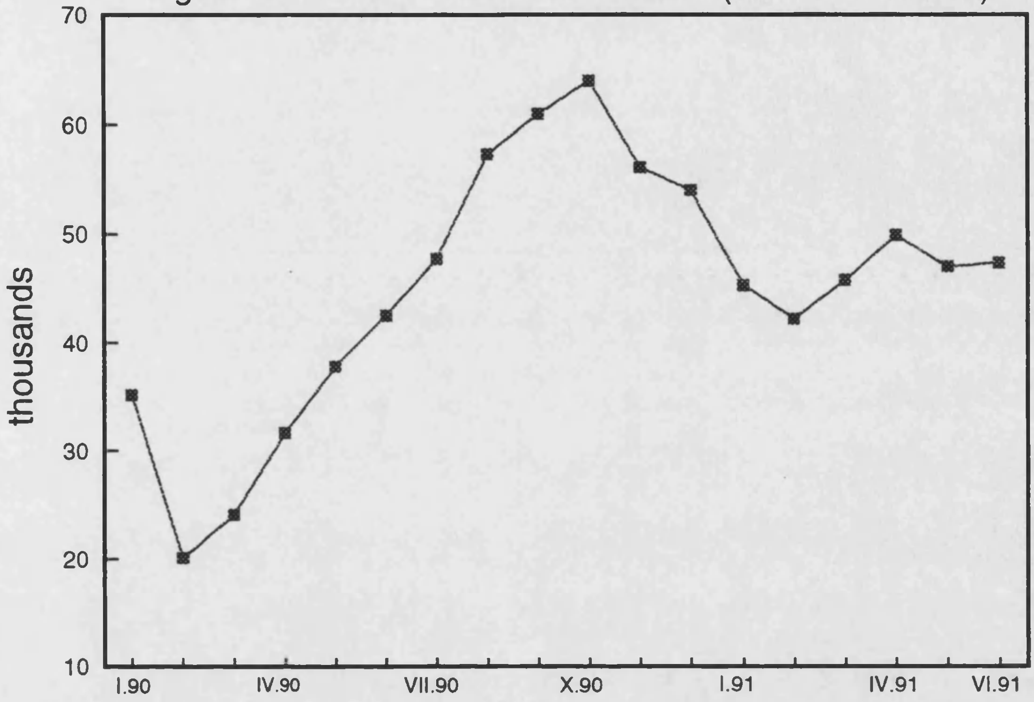
Figure 4.9 - Unemployment & Unemp. w/o group layoffs & school leavers
Poland (Jan 90 - June 91)



For July 1990 we assume 62 000 unemployed school leavers.

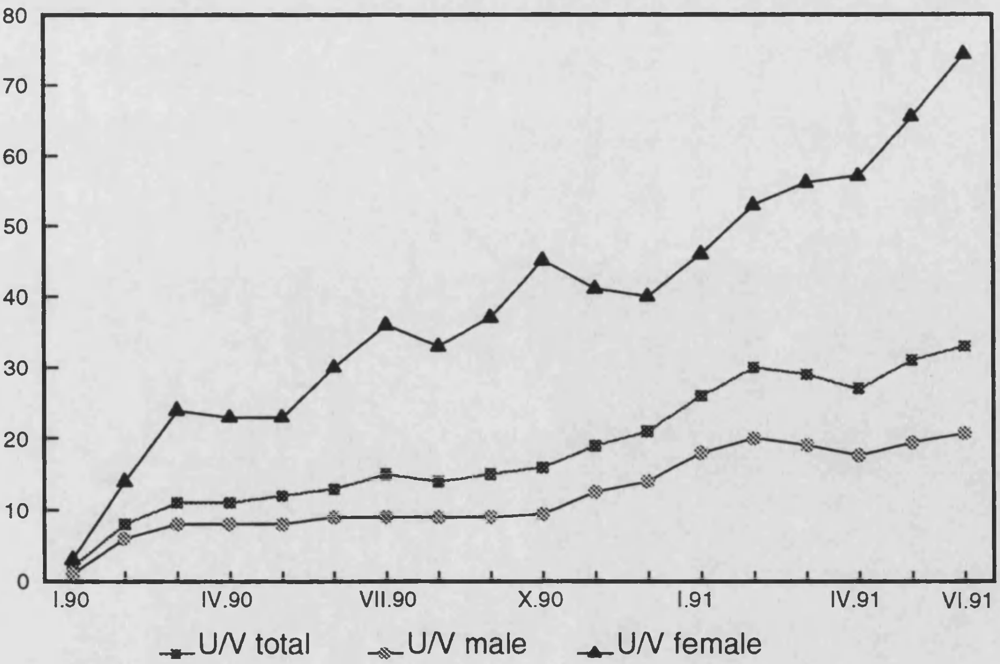
Source: GUS.

Figure 4.10 - Total Vacancies : Poland (Jan 90 - June 91)



Source: GUS.

Figure 4.11 - U/V Ratios : Poland (Jan 90 - June 91)



Source: GUS.

Figure 4.A1a
Output Adjustment with Constant Marginal Costs

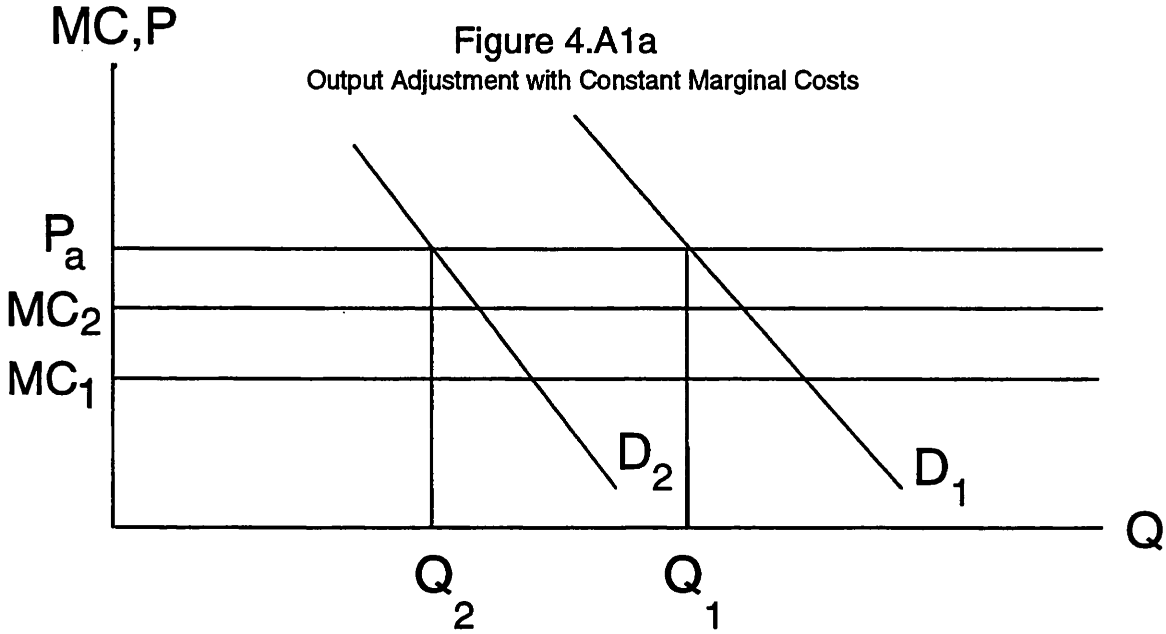
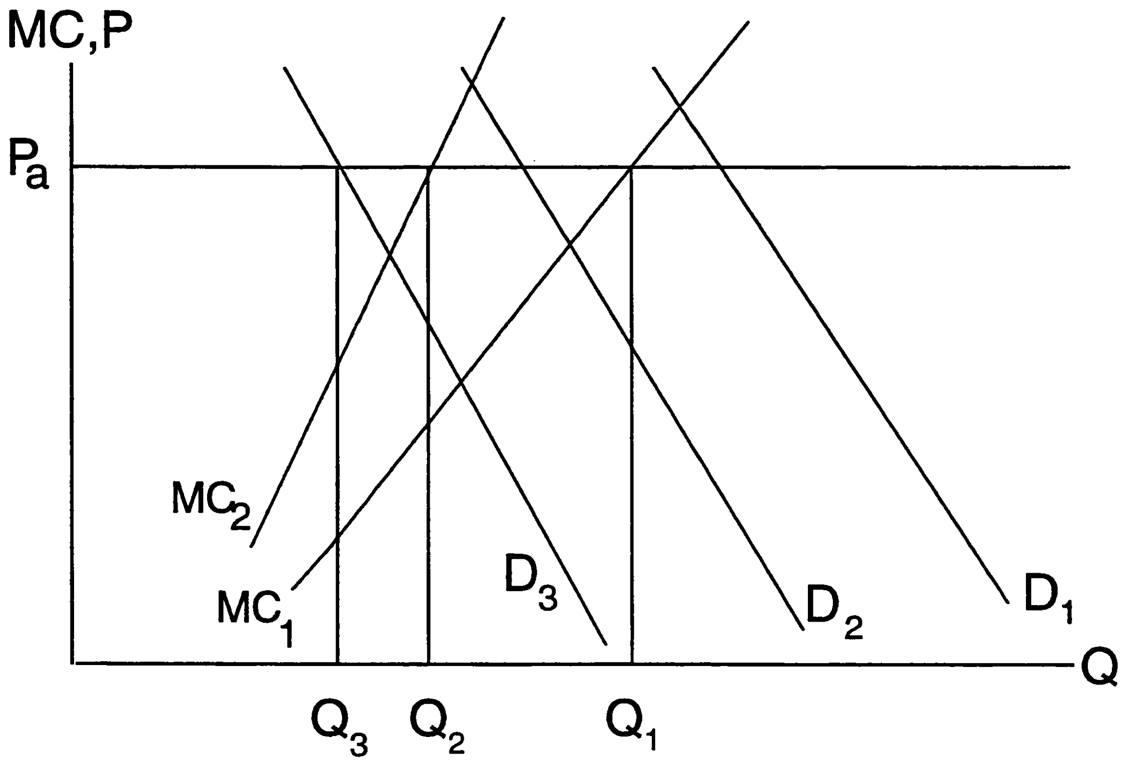


Figure 4.A1b
Output Adjustment with Rising Marginal Costs



Chapter 5

The Eastern German Labour Market in Transition: Gross Flow Estimates from Panel Data*

I Introduction

On July 1 1990 monetary and social union between the GDR and the Federal Republic of Germany took place, followed by political union on October 3 1990. Wages, salaries and pensions of GDR residents were converted into West German Marks at the rate of 1 to 1. At this exchange rate, allied with the political pressure for eastern wages to rise, the opening of the East German economy to world markets resulted in a sharp fall in economic activity, unprecedented in German history (Emmerich (1991)). The process of transition between planned and market economy has been associated with sharp falls in output and employment throughout Eastern Europe (see Estrin, Schaffer and Singh (1992)). Explanations have pointed to the collapse of the CMEA trading bloc, a price-cost squeeze at the enterprise level and a decline in domestic demand associated with significantly reduced real wages (Gomulka (1991), Schaffer (1992)). In the case of the former East Germany, Akerlof et al. (1991), have also pointed to the 'price-cost squeeze' which enterprises experienced due to monetary union between the Ostmark and the Deutschmark at favourable terms for East German consumers, but not producers.

In terms of the labour market, the process of transition is likely to be associated with increases in the stock of unemployment, both because of a dramatic increase in outflow from employment as firms reduce their labour forces in response to the recession and restructuring and from a decline in inflows to employment because the harsher financial climate reduces the ability of even potentially profitable firms to recruit new workers[1]. There has been considerable speculation about the likely labour market transition, but to date no solid evidence. For example, in Poland, Chapter 4 suggests that labour market transitions will be accompanied by moves out of the labour force by certain groups, most notably women, associated with changes in the benefits system and the pattern of labour demand. Lehmann et al. (1991) also observe pronounced regional differences in U/V ratios which are driven by differences in vacancy rather than unemployment rates. This can be taken as indirect evidence that while unemployment outflows differ by region, flows from employment do not. Our aim in this chapter is to provide more formal evidence on this important question by using the first available longitudinal panel on workers in an economy in transition to quantify and explain the flows between various labour market states[2].

Transition entails displacement of workers in the socialized sector and ultimate absorption of these workers (or some of them) in the private sector. The analysis of flows and their determinants strikes us, therefore, as especially useful when discussing developments in the labour market of an economy in transition. In the East German case, where large sums are being spent on labour market policies, flow analysis might also be helpful in the 'fine tuning' of such policies. Certain sub-pools of the unemployed might be characterized by relatively low unemployment outflow rates and should, then, be specifically targeted. In other transition economies, very low unemployment outflow rates for many sub-pools of the unemployed would, given the lack of funds for passive and active labour market policies, imply the need for a slow reform process.

Our objective is to document what happened to certain groups of the labour force differentiated by demographic characteristics and by industrial sector, in the first phase of economic transformation and what might happen in the near future. In doing so, we test whether standard models of the determination of labour market transitions applied to Western economies can provide a useful starting point for the investigation of labour market flows in a transforming economy.

The next section describes developments in the East German labour market since July 1990 using aggregate data, while section III discusses the micro data and the estimation procedures used in the analysis. Section IV presents and interprets the estimated labour market transitions and our regression results. The final section, then, summarizes the main findings.

II Developments in the Eastern German Labour Market

A general overview of developments in the East German labour market can be found in Bosch and Knuth (1991) and Emmerich (1991). Here we confine ourselves to a brief analysis of some of the aggregate data which have been collected by East German employment offices.

Since the collapse of the former GDR in late 1989, employment fell from 9.2 million in September of that year to 8 million in November 1990 and to 7.1 million in July 1991. This last figure excludes 400,000 employed residents who commute to West Germany. There are no certain figures on migration, but estimates speak of about 10,000 net outward migrants per month in 1991. The true fall in the demand for labour is greater than these numbers suggest. As Table 5.1 shows, the introduction of 'short-time work' ('Kurzarbeit') has been one of the major tools to deal with the output decline. The column headed 'fteusw' in Table 5.1 gives the full-time equivalent of unemployment calculated from the stock of 'short-time workers'[3]. From August 1990 until the middle of 1991 this type of unemployment has been persistently higher than open (registered) unemployment. People on training and job creation schemes, i.e. active labour market policy (ALMP) measures, would in the absence of these schemes be unemployed. These two groups, full-time equivalent unemployment connected with short-time working and open unemployment sum to the stock of total unemployment[4]; the number of people who would be unemployed if there were no ALMP and no provision for short-time work. Participants of early retirement schemes are on purpose excluded from the stock of total unemployment, even though they are until retirement age financed by the unemployment benefit system[5].

While open unemployment appears only to rise for the first year and a half, total unemployment on our measure jumped dramatically in August 1990 (caused by a sharp rise in short-time work) and showed an upward trend until June 1991 (Table 5.1). Until this last date the gap between the two stocks widened and then remained virtually constant for the rest of 1991. At the beginning of 1992, with many short-time contracts running out, open unemployment rose sharply[6]. At the end of the period the open unemployment rate has reached around 15 per cent from around 3 per cent while the total unemployment rate rose over the two year period from 5% to 26% (Figure 5.2).

Additional information can be obtained from aggregate data on flow variables in Table 5.2[7]. Inflows into open unemployment originating nearly entirely from the employment state were for most of the period higher than outflows. Figure 5.3 points to the three months when there were large temporary increases in inflows. In January 1991 large lay-offs occurred after the first All-German elections, while the second largest inflows during the entire period were in July 1991 when short-time work contracts for many workers expired. In January 1992 the same occurred on a larger scale. Political decisions by the federal government (e.g. not to extend short-time work contracts) rather than economic causes underlie the three spikes in these inflow data.

There seem to be quite large outflows from the beginning of 1991, though these aggregate outflow figures do not allow us to quantify the transitions between different labour market states. Table 5.2 shows that inflows into training schemes are for most of 1991 nearly as large as outflows from open unemployment. We can conjecture that many of the unemployed flowing out of open unemployment move into training schemes. In our conception such flows do not reflect a change in labour market state. The same holds for job creation schemes. Figure 5.4 brings outflows from open unemployment and the sum of the inflows into training and job creation schemes together. From April until December 1991, the combined inflows into training and job creation schemes are <u>larger</u> than outflows from open unemployment. This can be explained by the modified regulations governing the application of ALMP in Eastern Germany. In contrast to Western Germany, workers need not be on the unemployment register to qualify for an ALMP measure, they can go directly from employment onto a measure if they are laid off. We, therefore, have no way of telling how much of the outflow from open unemployment is flow out of the labour force, inflow into employment and outflow into ALMP measures. Furthermore, there are no aggregate data on the bilateral flows between employment and the state out of the labour force. It is therefore impossible to calculate the magnitudes of transitions between states using aggregate data.

The IER-Labour Market Monitor data set, on the other hand, can be used to estimate gross flows between states and to analyze the determinants of labour turnover. We undertake this in the next two sections.

III Micro-Data and Estimation

The micro-data evidence for a labour market in transition is taken from the IER-Labour Market Monitor, a survey of 10,751 randomly selected individuals resident in the former German Democratic Republic in November 1990. The study is longitudinal. Participants are interviewed at four monthly intervals and it is these responses which enable the construction of a transition database. The sample used in this study is not entirely random. Attrition between the first two interview dates reduced the sample to 8,665 valid responses, which subsequently fell further to 7,605 in the third wave and 6,752 in the fourth. Our analysis is based on the 6,752 who provided responses for all four waves of the panel.[8] The appendix addresses the attrition problem in more detail and offers tentative support to the idea that attrition may not bias the estimated transitions substantially. The overwhelming cause of attrition is non-response and not migration. Only 0.6% of the original sample left for the West over the period. The reported results are nevertheless subject to the omission of non-respondents and migrants.

The underlying analytical approach follows Marston (1976), Toikka (1976) and Clark and Summers (1979,1982a,1982b), among others, in assuming that movements between states are governed by a Markov process. Hence the probability of transition between labour market states depends only on the state currently occupied. This seems appropriate for an economy subject to a sudden structural shock where individual work histories will be of lesser importance. The labour market is divided into three states: employment (E), unemployment (U) and outside the labour force (N).[9] This implies nine potential transitions which can be represented by the following matrix, P_h.

$$P_h = \begin{bmatrix} EE_h & EU_h & EN_h \\ UE_h & UU_h & UN_h \\ NE_h & NU_h & NN_h \end{bmatrix} \tag{5.1}$$

where UE_h, for example, represents the probability that individual h is observed employed at time t, conditional upon being unemployed at time t-1. The gross probability of transition from state i to state j is given by

$$P_{ij} = \frac{F_{ij}}{S_i} \qquad i,j=e,u,n \tag{5.2}$$

where F_{ij} is the number of individuals in state i in November 1990 and in state j in, say, March 1991, while S_i is the origin stock in November 1990. Under Markovian assumptions duration of state occupancy is exponentially distributed and given by the reciprocal of the outflow rate

$$\frac{1}{\sum_{j} P_{ij}} \qquad j \neq i \tag{5.3}$$

Alternatively, average duration is given by

$$Duration = \frac{U/L}{EU + NU} \tag{5.4}$$

where L=E+U+N .

Construction of gross flows enables the estimation of a vector of steady state, (ergodic) proportions, $e=\{e_e, e_u, e_n\}$. The equilibrium condition that all inflows into the state equal the sum of the outflows, corresponds to Pe = e, where P is the estimated transition matrix. In practice, e is given by the eigenvector corresponding to the unit eigenvalue of P, subject to the constraint that the sum of the elements in e equal one. Conditional on the continuation of the observed flow pattern throughout the transitionary period, such an estimated steady-state distribution provides an indication of the eventual composition of the Eastern German labour market following unification.

Individual transition equations are estimated by multinomial logit regression. The Markov probability of moving between states of the labour market thus becomes a function of the personal characteristics and local economic environment observed before any transition took place. Separate equations for men and women are presented since, as the data show, the labour market facing the two groups is quite distinct.

The probability of an individual moving from origin to destination state during the sampling interval is given by

$$Pr[Y_i = j] = \frac{EXP(B_j' Z_i)}{\sum_k EXP(B_k' Z_i)} \qquad j,k = 1,2,3 \tag{5.5}$$

where Z is a vector of personal and origin state characteristics.
The log likelihood for the sample is therefore

$$Ln\ L = \sum_{i=1}^{n} \sum_{J=1}^{3} D_{ij}\ Ln\ Pr[Y_i = j] \tag{5.6}$$

where D_{ij} equals one if the worker is observed in state j and zero otherwise. The interpretation of the regression coefficients is not straightforward and is best thought of as capturing the relative likelihood of being in each state. The marginal impact of a single explanatory variable, z_i, on the transition probability to state j, P_j, is given by

$$\frac{dP_j}{dz_i} = P_j[b_j - \sum_k P_k b_k] \tag{5.7}$$

where b is the appropriate element of the parameter vector B. Hence the magnitude, and even direction, of a variable's influence depends on the choice of P_j.[10] In the regressions which follow we present estimates of both coefficients and marginal impact evaluated at the sample mean transition probabilities, in order to aid the exposition. No attempt is made to model the instantaneous probability of transition, i.e. the hazard rate, given the absence of continuous duration data. Estimation of separate four-monthly transition probabilities is precluded by the small number of transitions between successive waves. Further, not all covariates are present in every wave, preventing pooling of the data. Thus we are obliged to conduct longer interval estimation. However, if there are few multiple movements over the sample period, the efficiency gain afforded by the larger number of transitions obtained when estimating longer interval probabilities should outweigh the bias arising from round-tripping[11].

IV Results

Table 5.3a presents gross annual transition probabilities of various age and sex groups into all three states between November 1990 and November 1991. If the transitions were governed by a Pure Markov process (homogeneous, stationary rates) then each individual would face transition probabilities given by row 1. The majority of individuals have remained in the same state over the sample period, as evidenced by the high figures for EE and NN; 84% and 80% respectively. However, Wadsworth (1989) estimates an annual EE probability of 93% using annual survey data for Britain during the slump of the early eighties. Further, as the appendix indicates, the incidence of migration over this period was insufficient to affect these figures to a large extent. The magnitude of the shock to employment in the former GDR, (a 16.4% annualised fall), appears to have affected a greater proportion of the workforce than in a Western economy under recession. There is evidence, (see Wahse et al. (1992)) for those workers in establishments under the control of the Treuhand, approximately 50% of employment in January 1991, that most of these outflows were a result of labour shedding. The existence of severance packages financed by the Treuhand and the state may have encouraged early retirement among older workers. Certainly the highest employment outflow rates are for older workers, (rows 6 and 9) and the majority of these flows are out of the labour force. The magnitude of these flows, 24% for men, is twice that observed for Britain in 1983-84. Rates of labour force withdrawal for other age groups are comparable with western economies.

The loss of employment is only partially offset by the creation of new jobs, the flows UE and NE. The relative magnitudes of employment inflows, the unemployed and out of the labour force stocks multiplied by the appropriate inflow probabilities, implies a net employment loss of 10.3% over the year, again higher than in the West.[12] Higher employment outflows contribute principally to this observation. The estimated rate of job accessions, UE and NE, are broadly comparable to estimates from the United States (Clark and Summers (1979)) and Britain (Wadsworth (1989)), 25.4%, 2% in the former and 28.4%, 15.1% in the latter.

The existence of differential labour market experiences between men and women is highlighted by rows 2 and 3. Women are more at risk from loss of employment than men. At the same time, their chances of obtaining a job, the combined effect of UE and

NE, are some 5 percentage points lower. In Britain, unemployed women have larger unemployment outflow rates than men, mainly because the pattern of job creation, principally in service industries, favours the employment of women. As yet, job creation in the former GDR does not mirror this pattern (see Table 5.4 below). Rows 4 to 9 outline the influence of age on transition probabilities. As in the West, prime-age workers enjoy greater employment stability and labour force attachment. The duration of unemployment for many older workers is shorter due to the increased likelihood of labour force exit. Younger workers face preferential hiring rates.

Table 5.3b presents a similar analysis utilising four-monthly flow data derived from each successive wave of the panel. The general pattern is similar to the annual transitions. The labour market experienced a sharp increase in turnover between the third and fourth waves of the survey. The termination of many short-term working agreements, introduced one year earlier, around this time underlie this rise in employment flows, (see also Figure 5.3). Unemployment accessions also rose, primarily among women, though insufficiently to prevent the employment stock falling further. The observed four-monthly flows help to confirm that, during this phase of transition, the eastern German labour market was not subject to frequent changes of state by its workforce. Only 8.6 % of the unemployed stock made multiple moves over the year, of which 3.2 percentage points returned to the origin state. This compares with 48.6% who made just one move. The potential for underestimating the extent of labour market flows when using annual estimates therefore, in this instance, is not large.[13]

Using either equation (5.3) or (5.4), then the average completed duration of unemployment rose from around 11 to 16 months between November and March, but declined back to around 11 months, (8 months men, 15 months women) by July 1991.

The latter fall however, is equally distributed between accessions and labour force withdrawals. In Britain the average duration of unemployment was around 9 months during the recessionary years of 1983 - 1986 (Layard et al. (1991), p. 224). Bellmann and Lehmann (1991) show that the high proportion of long-term unemployed in the total stock contributes substantially to estimates of completed duration for Britain. Table 5.4 outlines the composition of the unemployed stock in November 1991[14]. Only 18% had been unemployed for more than one year. Further, duration-specific employment inflow rates vary by only 4.4 percentage points between the less than 4 month and greater than 8 month categories, (8.9, 1.9 points for men and women respectively). Unemployment duration in Eastern Germany, already comparatively long, is at this stage of the transformation process not a function of the persistence of unemployment, but appears to be principally determined by the inability of the labour market to retain and absorb workers. However, unless unemployment outflow rates rise above current levels, then a build-up of long-term and persistent unemployment seems inevitable.

The steady state distribution implicit in these transition estimates is given in Table 5.3c. Were this pattern of behaviour to continue then the labour force would shrink from 81% to 68% of the population of working age, some 1.2 million individuals, and the unemployment rate would stabilise at around 10.7% or approximately one million (6.1% for men and 16.1% for women). This compares with 71.8% and 4.9% for West Germany in 1989. So whilst the labour force becomes broadly comparable with that of the western part of the country prior to unification, the steady state unemployment rate in the East remains twice as high. When disaggregated by sex, the large male EN and UN flows engendered by the transformation process over the sample period result in a higher eventual incidence of labour force withdrawal in equilibrium than for women[15]. This is, of course, in stark contrast to West Germany where in 1989 the proportion of women not in the labour force was higher by about 28 percentage points. Women may remain in the Eastern labour force due to less generous severance packages given to non-household heads. Over the sample year, Table 5.3c also shows the changing stocks of the working age population. The stocks for women display a more rapid convergence, commensurate with the disproportionate shock felt by the female labour market after unification.

Tables 5.5 and 5.6 present annual transition probabilities with different disaggregations. The employment state is divided into nine or four sectors respectively and the unemployed and those on training schemes are categorised separately in an attempt to address the role of active labour market policies as the infrastructure of the economy is reorganised away from sectors, and their associated bureaucracies, favoured under central planning. Those engaged on job creation schemes cannot be identified separately and appear as employed. Table 5.5 gives the maximum disaggregation of employment which can be recovered from the data. The number of annual transitions between some of the employment sectors is, however, quite small and the estimated transition probabilities may be subject to sampling error and should be treated as somewhat tentative. To reduce sampling error transition probabilities are also calculated for an employment state disaggregated into only four sectors.

The estimated annual outflow rates in Table 5.5 are highest for agriculture and manufacturing, lowest for transport, finance and other services. Displaced workers in agriculture and manufacturing are equally likely to be absorbed by other industries. In contrast, workers in the distribution services, primarily retail workers, are twice as likely to leave employment than find jobs elsewhere. Only the financial sector, construction and other services experienced net employment growth, as inflows exceed outflows over the sample period. A large proportion of these inflows were from outside the labour force. The high growth rate for the financial industries is symptomatic of a sector which was hitherto negligible. Other services are the main recipients of workers from outside the labour force and indeed from all sectors.

There are also smaller unemployment outflows into construction and the distributive trades. This, despite a large outflow rate from the latter. This is probably the result of a rundown of the old state trading agencies and retail outlets and their replacement by larger new firms and western-owned stores. Many of these employment inflows will be into job creation schemes with finite duration. The majority of these sectoral flows occurred after July 1991. The enhancement of the job creation scheme programme, the ending of short-time work together with the establishment of administrative and legal structures compatible with a market economy around this period should have helped stimulate the observed increase in turnover.

The last row of Table 5.5 gives the ergodic distribution of the population of working age corresponding to the observed annual transition probabilities. If flows continued as in the reported period for the foreseeable future, the Eastern German labour market would arrive at this composition in the steady state. The proportions in manufacturing, mining and agriculture become strikingly small, while within the expanding services sector financial services remain surprisingly low. Calculating ergodic distributions on the basis of "one data point" may only be sensible if the assumed continuity of flows holds, i.e. if the parameters underlying labour market flows do not change dramatically during the transition from a centrally planned to a market economy. Theory might predict dramatic changes. However, the flows in the Eastern German labour market in the reported period were above all determined by a rising wage-productivity gap, a lack of demand for domestically produced goods (within the country and in the former CMEA trade area), a relatively low private investment rate, caused mainly by the very slow process of establishing property rights and the immense clean-up costs of a polluted environment (Dornbusch and Wolf (1992)). Finally, a wide-ranging set of passive and active labour market policies also had a great impact on labour market flows. Given current information, it is hard to see how a dramatic change in these parameters can come about in the near future. Even under a changing economic environment the ergodic calculations illustrate the likely direction of the adjustment process.

In equilibrium, nearly one third of the population of working age have left the labour force, 6.8% are on the unemployment register and 2.8% on training schemes. In Table 5.3a the unemployed and those on training schemes are both categorized as unemployed, hence the steady state estimates using both classifications are similar[16]. The figure for training scheme participants implies a steady state stock of approximately 250,000 which seems of the right magnitude given the large further training and retraining needs of the Eastern German labour market in the coming years.

Comparing the employment structure at the beginning of the reported period and in the steady state we see a tripling of the share of the financial sector and a 25% rise in other services. With the exception of construction the shares of all other sectors decline with the greatest losses in agriculture, mining (a sector seemingly bound for extinction) and metal manufacturing. With the construction sector booming (Dornbusch and Wolf(1992)), the small rise in its share of employment points to a more efficient use of labour.

Table 5.6 and Figure 5.5 give distributions of the working age population with employment being divided into the sectors agriculture, production, transport and trade and services. They show that in equilibrium production will fall by 20.3 percentage points while services will rise by 8.2 percentage points. Large movements out of the labour force and a rise in the proportion of the unemployed and training schemes imply a sharp contraction of employment.

Past employment distributions for West and East Germany and the future employment structure of Eastern Germany based on the ergodic distribution of Table 5.6 are shown in Figure 5.6[17]. The chart for West Germany represents the sectoral division of a highly developed market economy. One possible adjustment path of the Eastern German labour market is convergence to its West German counterpart. Chart 4 in Figure 5.6 seems to point to a quite different sectoral division of the future Eastern German labour market. Our calculations indicate that employment in agriculture will shrink to only 2.2% while employment in transport and trade will slightly exceed the West German proportion of 19%. Most strikingly, however, the estimated flows imply a very large reduction in the production base and a rise in the employment share of services to 52.7%. How large these implied changes are can be seen by comparing the experience of two European countries with substantial adjustments in their employment structure in the eighties. Over the period 1980 to 1990, the British economy underwent restructuring as a result of the second oil shock in 1979 and the deep recession of the early eighties. Manufacturing in the Northern region of England shrank by around six percentage points, (Regional Trends (1991)). In Italy the employment share of industry fell from 42.7% in 1980 to 35.4% in 1987 (Ministero del Lavoro e della Previdenza Sociale (1989)). From the previous discussion it is also clear that the implied spectacular rise in the proportion of services is above all a function of massive labour force exit from manufacturing and agriculture rather than a sign of a buoyant services sector. Our calculations give empirical support to the emergence of a 'German Mezzogiorno', hitherto mooted by Dornbusch and Wolf (1992) among others.

The multinomial logistic regressions of Tables 5.7 to 5.9 attempt to identify the factors which underlie the flows in Tables 5.3 to 5.6. Table 5.7 presents estimates of annual employment transition probabilities separately for men and women. Tables 5.8 and 9 give estimates of the eight-monthly transition probabilities from unemployment and out of the labour force respectively.[18] From Table 5.7 it emerges that those workers most at risk from loss of employment are similar to those with a marginal employment attachment in the West, i.e. at either end of the age spectrum and the unskilled, (admittedly those without qualifications form only 5% of the East German labour force). The loss of employment amongst men is less selective than for women. The adoption of West German 'Sozialpläne' statutes by the East, whereby employees considered to be primary household earners in families with dependents are protected against layoff, may explain the positive outflow estimates for single men and the insignificant coefficients for women. The opposing male/female coefficients for education reflect both effects of these statutes and the different career paths taken by the two groups. For example, men with Fachschule degrees received specialised training geared toward the sectors favoured in a planned economy, whilst many women with the same qualification were employed in the service sector where demand has latterly held up (cf. Reuschel and Hensel (1992)). The tenuous hold on employment for those on short-time work is confirmed. For men, employed in larger establishments, the marginal effects indicate that a worker on short time faces an average 50% rise in the likelihood of losing a job over the sample period.

Men are around 8 percentage points more at risk from loss of employment in plants with over 1000 workers. Smaller establishments are evidently more able to adapt to the new environment than the large "Kombinate". Private ownership of the firm results in significantly higher male outflow rates into unemployment, (but not labour force exit). Private employers appear to react to competitive conditions by shedding labour quicker than their counterparts under the Treuhand. Western control appears to make little difference to this pattern. The findings of Table 5.3 for older workers are confirmed here.

Employment outflows vary across regions for men, but not women. As one would expect, the male labour market in Berlin, the default category, is more dynamic than in other Länder. Women however, are losing work uniformally across the country, conditional on industry of employment[19].

Age and marital status are the major determinants of outflows from unemployment in Tables 5.8a and 5.8b. In addition, for men, the higher the benefit level, the lower the likelihood of gaining employment and the lower the likelihood of leaving the labour force. The marginal effect suggests that a 100 Mark increase in monthly benefit income would reduce the transition probability into employment by 1.5 percentage points. At the same time, the labour force exit probability is lowered by .8 percentage points. Eastern Germany adopted the West German unemployment compensation system, whereby the level of benefit during the initial stage of unemployment, ('Arbeitslosengeld'), is a fixed proportion of previous earnings, the duration of entitlement depending on past experience in the labour force, (Hunt 1991). The former effect could be attributable to the receipt of unemployment income reducing job search activity, as outlined by Mortensen (1977). Conversely, it may be the result of employer's preferences for younger workers, who under the earnings-related benefit system would typically receive lower state support than their older counterparts. The UN effect of benefits may be due to the 'entitlement' effect advocated by Hammermesh (1979), since benefit receipt encourages workers to remain active in the labour force. Alternatively, more experienced, high benefit workers might be expected to remain within the labour force independently of any benefit effect. Other personal income appears to reduce male, but not female, outflows. This variable may partly be capturing extended search opportunities afforded by savings accumulated under a regime of excess demand for goods, and subsequently realised under the Deutschmark conversion. Similar supply-side conditions do not appear to influence the female labour market, where higher educational attainment is a more significant predictor of a transition into employment. Regional differentials, as a probable proxy for the level of local labour market activity, are important in determining male labour force exits.

Table 5.9 suggests that, again as in the West, higher levels of income and old age discourage labour force entry.[20] The likelihood of those over 50 years of age obtaining a job is some 45 percentage points lower than that for the prime-age worker, other things equal. The presence of children and higher educational qualifications encourage labour force entry and the prospect of being hired. The need to expand household income, whether caused by unemployment of other household members or the development of a consumer good market, seems to have generated an added worker effect.

V Conclusions

Our results confirm that transition in East Germany was associated with a sharp rise in unemployment, primarily because of an increase in the flows of workers into the unemployment state. If we take account of short-time working and active labour market policies, the scale of the emerging unemployment problem is enormous, and provides a worrying signal to countries embarking on the path of reform rather later, or more slowly, than East Germany. This is particularly so when one reflects that, while the exchange rate chosen was unfavourable, the East Germans have the advantage, relative to all other countries in transition, of direct access to Western capital, management and know-how. The estimated average completed duration of unemployment, already quite long at this stage of the transition process, points to the real danger of a large component of long-term unemployment among the unemployed. Unless there is a strong commitment to wage moderation in the other economies of transition, long-term unemployment should become an even more serious problem in these countries as expenditures on active labour market policies, relative to Germany's, are and will stay minuscule. Another finding worth stressing is that, for men at least, labour market adjustment is significantly affected by private ownership. With regard to improved industrial efficiency, this result is encouraging for those who favour rapid privatization. However, as Tables 5.3a - 5.3b indicate, the labour market is not yet able to absorb the majority of these displaced workers. This is unsurprising in an economy which lacks the necessary infrastructure and legal framework conducive to large scale private sector job creation.

The lack of predictive power in the regression for women can be interpreted as a sign that women experience uniformly bad prospects for continued employment irrespective of the economic environment. Steady state calculations point to an eventual eastern German labour force of similar proportion to those in the West, but with a twice as high unemployment rate of 10%. The composition of employment may also be quite different, with an over-reliance on the service industries as the main recipients of labour as the manufacturing base of the economy contracts.

Finally, our regression results show that a standard model of the determination of labour market flows has substantial predictive power in the case of Eastern Germany. This suggests that standard methodology has a useful role to play in the analysis of labour markets in transition.

Footnotes

* This chapter is based on joint research with Lutz Bellmann, Saul Estrin and Jonathan Wadsworth. The bulk of the research was done by me.

1. Jackman and Scott (1992) argue that the rise in unemployment during the initial phase of transition is consistent with labour-managed firms becoming the dominant agent in the economy. However this is unlikely to hold for Eastern Germany where many existing establishments were taken over by the western-led Treuhand, who then exercised control over employment.

2. We construct this panel from an East German labour force survey commissioned by the Institute for Employment Research in Nuremberg, (IER-Labour Market Monitor).

3. In the official statistics, short-time workers are partitioned into quartiles according to the percentage shortfall of full-time work. For example, workers with between 75% and 100% of 39.5 hours are in the 0-25% category. Taking the midpoint of the proportions in each category and multiplying by the stock gives an estimate of Full-time equivalent unemployment associated with each short-time category. Most short-time workers categorized as working less than 25% are probably not working at all, consequently we somewhat underestimate the level of full-time equivalent of unemployment by the formula used.

4. Table 5.1 defines additional unemployment as the stock of training and job creation schemes together with those on short-time work. Hidden unemployment is often used in the Western literature to describe the above (eg Calmfors and Forslund, 1990). When discussing transition economies, hidden unemployment is better reserved for overmanning at the work place.

5. Early retirement arrangements are effective in rapidly reducing the labour force in a short period of time. Individuals having taken advantage of such arrangements are meant to have permanently exited the labour market and their average probability of re-employment is zero.

6. Figures 5.1 and 5.2 demonstrate that total unemployment has hardly changed at all in the last eight months of the reported period. What has dramatically changed is its composition, with open unemployment and ALMP participants now making up the great bulk of the unemployed. Once the infrastructure enabling the establishment of training and job creation schemes was set in place it was possible to give labour market policies a much larger active component than immediately after monetary and social union.

7. Movements of stock variables can lead to a wrong assessment of the processes taking place in a labour market in transition. For example, according to Table 5.1 in 1991 there was an upward trend for both unemployment and vacancies which could erroneously be interpreted as the emergence of mismatch. Consulting Table 5.2, however, one can see that outflows from unemployment were virtually non-existent in the first months after monetary and social union, but reaching multiple levels of this initial period in 1991. The simultaneous rise in unemployment and vacancies should, therefore, be attributed to a general rise in economic activity. Inflows and outflows of vacancies permit the

in 1991 this interval either fell or never exceeded the level which it had at the beginning of the year; but a falling or constant interval contradicts the emergence of mismatch.

8. The dataset does contain some information on individuals who attrite but return in later waves of the survey. No attempt is made to ascertain the validity of the responses in each wave.

9. Individuals on training measures are combined with the unemployed. Our data set does not allow us to distinguish participants of job creation schemes and regularly employed people.

10. The normalisation constraint in our estimation package, (LIMDEP), sets the coefficients on the default category to zero. The default category is always chosen as the origin state.

11. Coppock commenting on Clark and Summers (1982) shows that in a 3 state world, the discrete probability of transition P_{ij} is given by

$$P_{ij} = r_{ij}/(r_{ij} + r_{ik}) * [1 - \exp(-r_{ij} - r_{ik})]$$

where r_{ij} is the instantaneous probability of movement. Hence, every observed discrete transition is influenced by the effect of the independent variables on <u>both</u> outflow rates.

12. The sample employment inflows (outflows) are 400 and 918 respectively.

13. The corresponding figures for the employed and inactive were (4.4%, 15.1%) and (4.2%, 17.7%) respectively. It is of course conceivable that a fraction of these multiple moves may be due to classification error. Nor can we discount the possibility that the four month interval between interviews disguise multiple transitions, though given the economic circumstances prevailing over the period outlined in section 1, such actions would seem unlikely.

14. In the absence of continuous spell data, these figures are constructed from the four-monthly flows.

15. The proportion of male economically inactive in the East had already overtaken the western equivalent by November 1991.

16. As the sample size underlying the flows in Table 5.3a is different from the sample size underlying the flows in Table 5.5 due to missing values in the industry dummies the ergodic distributions differ slightly.

17. Whilst the implied direction of these flows is undoubtedly plausible, the absolute magnitude of these movements is less precise. For example, the proportion of services in chart 4 of Figure 5.6 may be biased upward as our data set cannot distinguish between flows into 'proper' employment and job creation schemes. As most positions on job creation schemes are in the service sector, the observed flows bias the steady state

proportion of services upward. Conversely, around 30% of establishments under Treuhand administration were not viable and heavily subsidized (Dornbusch and Wolf, 1992). In the medium term these establishments will be liquidated. Hence, the observed flows indirectly bias the steady state proportion of services downward as long as those losing their employment in manufacturing and mining due to liquidation cannot all be re-employed in production, which seems the most likely outcome.

18. The eight-monthly time interval was chosen to allow the incorporation of non-labour income data, available only after the first wave of the survey. The smaller sample size and consequent fall in the absolute number of flows between states necessitates a reduced parameter set. The transition matrices, available from the authors on request, are broadly comparable with those reported.

19. There is little evidence of strong correlation between industries and regions which might have accounted for these differences.

20. The relatively small number of outflows from the state necessitates the pooling of the sample by sex, acceptable according to the likelihood ratio test, and the combination of regional and education variables.

Appendix

Attrition

Only 6,756 individuals out of an initial sample of 10,751 provided valid responses for each wave of the survey. Table 5.A1 outlines the pattern of attrition. It is worth noting that migrants (and deaths) account for only 1.6% of attriters, (0.6% of the sample), the remainder being attributable to non-response. It is therefore unlikely that the estimated flows in Tables 5.4-5.6 are biased by any influence of migration. Whilst no attempt is made to explicitly model the attrition process in the discrete environment (see Hausman and Wise (1979) for a discussion of attrition bias with continuous data), Tables 5.A2-5.A4 indicates the possible biases caused by non-response. Dummy variables for individuals who attrite after March 1991 are included in pooled multinomial logistic regressions of the flows between the initial two waves of the panel. The results suggest that attrition may not bias the estimated flows substantially (cf. Tables 5.A2-5.A5). Only the coefficient on the future attriter dummy for the flow UN is significant, all other future attriter variables having no predictive power. This is corroborated by Chi-squared independence tests from contingency tables on these flows. The estimated marginal effect of attrition on UN suggests that concentration on non-attriters over-estimates the average probability of labour force withdrawal by around 9.5 percentage points.

Data Appendix

Information on individual socio-economic characteristics is taken from a matched sample of participants interviewed at four-monthly intervals between November 1990 and November 1991.

Age	= 1 if age falls in relevant age category, 0 otherwise.
Hochschule	= 1 if individuals highest qualification is university or equivalent, 0 otherwise.
Fachschule	= 1 if highest qualification is technical college level or equivalent, 0 otherwise.
Meister	= 1 if individuals holds skilled manual and supervisory qualification, 0 otherwise.
Lehre	= 1 if holds skilled manual qualification, 0 otherwise
Single	= 1 if single, divorced or separated, 0 otherwise.
Private	= 1 if employee's firm is privately owned, 0 otherwise
West	= 1 if employee's firm is under Western ownership, 0 otherwise.
Short-Time	= 1 if employed on short-time work, 0 otherwise.
Part-Time	= 1 if employee reports engaged on part-time work.
Benefits	= monthly unemployment benefit income divided by 100
Earnings	= monthly income from employment divided by 100.
Other Income	= Other monthly income divided by 100.

Table 5.1

Vacancy and Unemployment Stocks in the East German Labour Market: July 1990 - May 1992

month	u	short	vac	train	jcs	fteusw	adu	totu*
				In Thousands				
7 90	272.0	556.3	27.7	--	--	242.4	242.4	514.4
8 90	361.3	1499.9	20.4	--	--	653.5	653.5	1014.8
9 90	444.9	1728.0	24.3	--	8.4	752.9	761.3	1206.2
10 90	536.8	1703.8	24.7	--	14.5	755.0	769.5	1306.3
11 90	589.2	1709.9	23.8	15.0	20.3	793.0	828.3	1417.4
12 90	642.2	1794.0	22.6	29.1	20.0	866.3	953.4	1595.8
1 91	757.2	1840.6	23.0	67.3	34.4	956.3	1058.0	1815.2
2 91	788.0	1947.1	20.8	112.8	47.0	1061.2	1221.0	2009.0
3 91	808.4	1989.8	20.9	167.8	62.5	1104.6	1334.9	2143.4
4 91	836.9	2018.9	22.9	210.4	84.9	1119.1	1414.4	2251.3
5 91	842.3	1968.5	25.3	239.0	113.6	1102.0	1454.6	2296.9
6 91	842.5	1898.9	31.7	272.4	148.2	1078.1	1498.7	2341.2
7 91	1068.6	1610.8	40.3	313.2	209.9	903.1	1426.2	2494.9
8 91	1063.2	1448.8	43.6	324.1	261.8	818.7	1404.6	2467.8
9 91	1028.8	1332.5	43.0	350.5	313.0	758.6	1422.2	2450.9
10 91	1048.5	1199.5	41.1	375.0	348.4	671.4	1394.8	2443.3
11 91	1030.7	1103.4	35.8	410.4	371.1	627.4	1408.9	2439.6
12 91	1037.7	1034.5	35.4	435.2	389.8	594.2	1419.2	2456.9
1 92	1343.4	519.7	39.7	438.0	394.1	297.9	1130.0	2473.5
2 92	1290.3	518.8	34.2	470.9	399.5	285.1	1155.5	2445.9
3 92	1220.1	493.9	33.3	496.9	401.5	263.2	1161.6	2381.7
4 92	1196.0	466.3	31.3	507.3	404.5	246.6	1158.4	2354.3
5 92	1149.1	436.5	30.2	510.3	404.9	230.5	1145.7	2294.8

* u - open unemployment;
short - short-time workers;
vac - vacancies;
train - training schemes participants;
jcs - job creation schemes participants;
fteusw - full time equivalent of unemployment for short-time working;
adu - additional unemployment = train + jcs + fteusw;
totu - total unemployment = u + adu;
-- - not available.

Source: Bundesanstalt für Arbeit (BA) and own calculations.
Note: Stock figures are end-of-month data.

Table 5.2

Flow Variables in the East German Labour Market: July 1990 - May 1992

month	infl	infl/emp	outfl	invac	outvac	place	train	jcs*
			In Thousands					
7 90	132.0	118.3	2.1	8.8	22.3	--	--	--
8 90	107.0	95.9	17.7	10.4	17.7	--	--	--
9 90	107.1	102.0	23.5	18.6	14.6	--	--	--
10 90	121.9	119.3	30.0	24.2	23.7	--	--	4.8
11 90	94.0	92.1	41.6	23.3	24.3	--	--	6.6
12 90	95.4	93.7	42.4	22.2	23.3	--	--	7.7
1 91	174.3	172.1	59.3	31.5	31.1	25.9	38.2	14.2
2 91	92.8	90.1	63.0	29.6	31.7	26.2	45.5	14.2
3 91	91.2	88.6	69.8	35.6	35.5	29.9	55.0	16.5
4 91	109.4	107.4	80.8	49.4	47.4	42.8	73.0	24.0
5 91	78.7	77.0	73.3	55.3	52.8	47.4	69.5	30.2
6 91	81.8	79.6	81.6	74.1	67.6	61.1	81.3	40.3
7 91	324.9	318.9	98.7	113.1	104.6	95.9	95.6	68.1
8 91	86.8	83.7	92.2	93.1	89.8	82.6	78.1	56.6
9 91	94.5	90.8	129.0	92.6	93.2	86.9	85.7	58.7
10 91	129.4	127.0	109.7	70.6	72.4	66.2	91.9	40.2
11 91	87.8	85.3	105.6	59.4	64.6	58.5	89.6	32.5
12 91	91.1	87.2	84.1	54.0	54.4	48.4	88.7	26.5
1 92	416.7	413.4	110.9	71.1	66.8	60.6	77.2	30.8
2 92	90.1	85.0	143.1	60.6	66.2	57.7	103.1	29.2
3 92	84.0	78.4	154.2	68.2	69.1	63.3	99.4	30.4
4 92	114.8	107.5	139.0	65.0	67.0	60.7	84.2	28.2
5 92	80.4	73.4	127.3	57.2	58.2	52.3	77.2	--

* infl - inflows into open unemployment;
infl/emp - inflows into open unemployment from employment;
outfl - outflows from open unemployment;
invac - inflows of vacancies;
outvac - outflows of vacancies;
place - job placements by employment offices;
train - inflows into training schemes;
jcs - inflows into job creation schemes;
-- - not available.

Source: Bundesanstalt für Arbeit.

Table 5.3a

Labour Market Transition Probabilities by Sex and Age: November 1990 - November 1991

Sex and Age	EE	EU	EN	UE	UU	UN	NE	NU	NN
	Probability of Transition								
1) Total	.836	.093	.071	.350	.373	.277	.160	.041	.799
2) Male	.864	.057	.079	.399	.270	.331	.135	.016	.849
3) Female	.806	.132	.062	.315	.448	.237	.172	.054	.775
Males									
4) 16-24 yrs	.877	.072	.051	.667	.278	.055	.376	.043	.581
5) 25-49 yrs	.924	.065	.011	.591	.348	.061	.261	.043	.696
6) 50-64 yrs	.728	.033	.239	.125	.188	.687	.008	--	.992
Females									
7) 16-24 yrs	.734	.181	.084	.533	.400	.067	.354	.105	.541
8) 25-49 yrs	.843	.134	.023	.405	.535	.060	.493	.147	.360
9) 50-59 yrs	.717	.102	.181	.125	.319	.556	.012	.008	.980

E=Employment, U=Unemployment, N=Not in Labour Force. Origin state
sample sizes: E=2672, U=148, N=385 men, E=2523, U=203, N=821 women.
-- indicates no transition observed.

Table 5.3b

Labour Market Transition Probabilities by Sex and Age: November 1990 - March 1991

Sex and Age	EE	EU	EN	UE	UU	UN	NE	NU	NN
	Probability of Transition								
1) Total	.936	.043	.021	.182	.658	.160	.057	.021	.922
2) Male	.946	.033	.021	.243	.574	.183	.031	.011	.958
3) Female	.927	.053	.021	.138	.719	.143	.069	.026	.905
Males									
4) 16-24 yrs	.953	.043	.004	.389	.611	--	.077	.017	.906
5) 25-49 yrs	.962	.033	.005	.303	.682	.015	.087	.087	.826
6) 50-64 yrs	.907	.029	.064	.141	.453	.406	.004	--	.996
Females									
7) 16-24 yrs	.928	.055	.017	.200	.800	--	.128	.035	.837
8) 25-49 yrs	.944	.051	.005	.172	.819	.009	.200	.087	.713
9) 50-59 yrs	.869	.058	.073	.069	.542	.389	.010	.004	.986

Origin state sample sizes: E=2672, U=148, N=385 men, E=2523, U=203, N=821 women.

March 1991 - July 1991

Sex and Age	EE	EU	EN	UE	UU	UN	NE	NU	NN
	Probability of Transition								
1) Total	.930	.054	.016	.182	.751	.067	.056	.025	.919
2) Male	.943	.040	.017	.281	.657	.062	.044	.024	.932
3) Female	.916	.069	.015	.123	.807	.070	.063	.025	.912
Males									
4) 16-24 yrs	.946	.043	.011	.360	.560	.080	.131	.028	.841
5) 25-49 yrs	.962	.034	.004	.343	.647	.010	.148	.074	.778
6) 50-64 yrs	.899	.052	.049	.118	.725	.157	.006	.019	.975
Females									
7) 16-24 yrs	.910	.069	.021	.129	.839	.032	.135	.034	.831
8) 25-49 yrs	.917	.075	.008	.137	.838	.025	.248	.068	.684
9) 50-59 yrs	.916	.048	.036	.083	.708	.209	.005	.014	.981

Origin state sample sizes: E=2575, U=178, N=452 men, E=2422, U=300, N=825 women.

Table 5.3b (continued)

July 1991 - November 1991

Sex and Age	EE	EU	EN	UE	UU	UN	NE	NU	NN
	Probability of Transition								
1) Total	.917	.044	.038	.222	.657	.121	.079	.015	.906
2) Male	.931	.029	.040	.264	.520	.216	.069	.013	.918
3) Female	.903	.061	.036	.200	.730	.070	.085	.016	.899
Males									
4) 16-24 yrs	.920	.045	.035	.448	.483	.069	.221	.032	.747
5) 25-49 yrs	.958	.033	.009	.325	.634	.041	.286	.036	.679
6) 50-64 yrs	.866	.011	.122	.101	.354	.545	.011	.006	.983
Females									
7) 16-24 yrs	.814	.113	.073	.167	.729	.104	.264	.031	.705
8) 25-49 yrs	.929	.055	.016	.220	.743	.037	.300	.070	.630
9) 50-59 yrs	.859	.054	.087	.146	.683	.171	.009	.003	.988

Origin state sample sizes: E=2499, U=231, N=475 men, E=2307, U=430, N=810 women.

Table 5.3c

Sample and Ergodic Distributions for Population of Working Age

	E	U	N
Men and Women			
Sample			
a. November 1990	.769	.052	.179
b. November 1991	.689	.100	.211
Ergodic			
a. Annual	.555	.105	.340
b. Four-monthly Average	.574	.107	.319
West Germany: 1989*	.669	.049	.282
Men			
Sample			
a. November 1990	.833	.046	.120
b. November 1991	.754	.064	.182
Ergodic			
a. Annual	.548	.052	.400
b. Four-monthly Average	.564	.061	.375
West Germany: 1989	.802	.051	.147
Women			
Sample			
a. November 1990	.711	.057	.231
b. November 1991	.631	.132	.237
Ergodic			
a. Annual	.531	.157	.312
b. Four-monthly Average	.543	.161	.296
West Germany: 1989	.532	.047	.421

*Source for West Germany: Federal Statistical Office (1992).

Table 5.4

Unemployment by Duration: November 1991

Total	
< 4 months	.352
4-8 months	.280
8-12 months	.188
12 months +	.180
Male	
< 4 months	.399
4-8 months	.283
8-12 months	.136
12 months +	.182
Female	
< 4 months	.330
4-8 months	.279
8-12 months	.212
12 months +	.179

Table 5.5
Gross Labour Force Transition Probabilities by Sector: November 90 - November 91

Origin State	agric	mine	metal man.	other man.	const	distr	trans	fina	other serv.	Σ_1	Unemp	Schem	NLF	Σ_2
	Destination State: November 91													
Employment:														
agricult	.545	.002	.040	.023	.042	.047	.021	.007	.047	.229	.084	.026	.117	.227
mining	.007	.653	.056	.003	.035	.042	.007	.007	.059	.216	.031	.031	.069	.131
metal man	.003	.005	.625	.039	.028	.029	.009	.011	.040	.164	.076	.060	.073	.209
other man	.003	.005	.061	.551	.050	.034	.003	.010	.074	.240	.091	.050	.069	.210
construct	.007	--	.042	.026	.751	.012	.005	.002	.040	.134	.044	.012	.061	.117
distribut	.002	.002	.013	.036	.021	.644	.013	.015	.028	.130	.129	.021	.077	.227
transport	.005	--	.014	.016	.008	.019	.789	.005	.051	.118	.022	.011	.060	.093
finance	--	--	--	--	--	.014	--	.795	.096	.110	.027	.041	.027	.095
other ser	.004	.004	.003	.023	.014	.017	.013	.006	.786	.084	.047	.018	.067	.132
Unemployment	.009	.003	.009	.028	.040	.037	.012	.019	.143	.300	.318	.084	.296	.380
Schemes	--	--	.043	--	.043	.087	.043	--	.435	.651	.043	.217	.087	.130
Not in Labour Force	.009	.003	.011	.010	.014	.025	.007	.009	.061	.149	.035	.007	.809	.042
Turnover Rate	-.380	-.278	-.249	-.228	.100	-.052	-.043	.603	.006		.511	7.609	.023	
Sample Distr.	.064	.043	.145	.094	.064	.080	.055	.011	.211		.048	.003	.180	
Ergodic Distr.	.012	.008	.037	.040	.071	.065	.046	.039	.268		.068	.028	.318	

Note: Category 'Schemes' incorporates all participants on government training measures. Σ_1(Σ_2)=sum of transition probabilities into other employment (out of employment). -- indicates no transition observed. Turnover Rate is calculated as the change in the respective stocks divided by the original stock. Sample Size = 6666; sample distribution is given for origin state.

Table 5.6
Gross Labour Force Transition Probabilities by Sector: November 90 - November 91

	Destination State: November 91								
Origin State	agric	prod	trans. &trade	services	Σ_1	Unemp	Schem	NLF	Σ_2
Employment:									
agricult	.545	.107	.068	.054	.229	.084	.026	.117	.227
production	.004	.718	.035	.060	.099	.069	.045	.069	.183
trans.&trade	.003	.058	.719	.049	.110	.085	.017	.069	.171
services	.004	.040	.029	.797	.073	.046	.019	.065	.130
Unemployment	.009	.081	.050	.162	.302	.318	.084	.296	.380
Schemes	--	.087	.130	.435	.652	.043	.218	.087	.130
Not in Labour Force	.009	.038	.032	.070	.149	.035	.007	.809	.042
Turnover Rate	-.380	-.182	-.049	.035		.511	7.609	.023	
Sample Distr.	.064	.347	.135	.222		.048	.003	.180	
Ergodic Distr.	.013	.144	.115	.304		.069	.028	.326	

Note: Category 'Schemes' incorporates all participants on government training measures. Σ_1(Σ_2)=sum of transition probabilities into other employment (out of employment). -- indicates no transition observed. Turnover Rate is calculated as the change in the respective stocks divided by the original stock. Sample Size = 6666; sample distribution is given for origin state.

Table 5.7a
Multinomial Logit Estimates of Employment Transitions: November 1990 - November 1991 (Men)

Independent Variable	Sample Mean	E - U Estimate	E - U dP_u/dx_i	E - N Estimate	E - N dP_n/dx_i
Constant		-2.365** (0.537)		-3.434** (0.594)	
Age < 25	0.103	-0.073 (0.308)	0.009	0.990** (0.426)	0.183
Age >= 50	0.280	-0.533** (0.262)	-0.044	3.077** (0.287)	0.662
Single	0.229	0.604** (0.226)	0.105	0.143 (0.265)	0.001
Children	0.455	-0.147 (0.208)	-0.039	-0.528** (0.265)	-0.055
Education:					
Lehre	0.538	0.184 (0.257)	0.008	-0.522** (0.237)	-0.063
Meister	0.115	0.418 (0.380)	0.059	-0.254 (0.313)	-0.043
Fachschule	0.142	0.585* (0.351)	0.058	-0.799** (0.309)	-0.095
Hochschule	0.146	0.625** (0.299)	0.054	-0.953** (0.338)	-0.106
Region:					
Mecklenburg	0.115	-0.128 (0.344)	-0.006	0.573 (0.397)	0.098
Brandenburg	0.154	-0.300 (0.336)	-0.032	0.482 (0.382)	0.087
Sachsen-Anhalt	0.173	-0.948** (0.360)	-0.109	0.448 (0.376)	0.099
Thueringen	0.173	-0.728** (0.341)	-0.090	0.165 (0.384)	0.043
Sachsen	0.308	-0.687** (0.305)	-0.092	0.122 (0.359)	0.037
Industry:					
Agriculture	0.097	-0.361 (0.400)	-0.047	0.091 (0.321)	0.023
Mining	0.074	-0.605 (0.472)	-0.082	-0.257 (0.382)	-0.019
Metal	0.254	0.196 (0.291)	0.024	-0.177 (0.285)	-0.028
Other Manf.	0.120	-0.102 (0.357)	-0.030	-0.464 (0.341)	-0.051
Construction	0.130	-0.394 (0.373)	-0.064	-0.411 (0.331)	-0.039
Distribution	0.061	0.533 (0.365)	0.062	-0.613 (0.445)	-0.079
Transport	0.091	-0.737 (0.454)	-0.105	-0.646* (0.382)	-0.057
Employment:					
Part-time	0.025	0.562 (0.465)	0.119	0.663 (0.442)	0.081
Short-time	0.212	0.996** (0.199)	0.193	0.483** (0.190)	0.031
Private	0.050	0.932** (0.351)	0.144	-0.562 (0.555)	-0.087
West	0.091	-0.108 (0.306)	-0.029	-0.416 (0.363)	-0.046

Table 5.7a (continued)

Establishment Size (no. of employees)					
200-1000	0.401	-0.052 (0.207)	-0.020	-0.386* (0.202)	-0.044
< 200	0.243	-0.512* (0.280)	-0.078	-0.315 (0.243)	-0.026
Earnings	12.436	-0.025 (0.023)	-0.001	-0.008 (0.022)	0.000

Diagnostics:

Log L		-1064.8
Log 0		-1308.5
Model Chi^2 (54)		490.2**
% correct predictions	Model	86.3
	Zero	86.4
Sample Size		2672

Note: Standard errors in parentheses. ** denotes significance at 5% level, * significant at 10% level. Sample mean transition probabilities EU=.057, EN=.079. Likelihood Ratio test for Male-Female sample split gave a test statistic of 178.4 ($Chi^2(54)_{.05}$=72.2).

Table 5.7b

Multinomial Logit Estimates of Employment Transitions: November 1990 - November 1991 (Women)

Independent Variable	Sample Mean	E - U Estimate	E - U dP_u/dx_i	E - N Estimate	E - N dP_n/dx_i
Constant		-1.821** (0.407)		-2.921** (0.603)	
Age < 25	0.094	0.405* (0.234)	0.109	0.919** (0.345)	0.134
Age >= 50	0.213	-0.146 (0.194)	0.013	2.048** (0.261)	0.452
Single	0.249	-0.056 (0.164)	0.005	0.472** (0.207)	0.077
Children	0.503	0.075 (0.149)	0.007	-0.171 (0.277)	-0.024
Education:					
Lehre	0.491	-0.137 (0.177)	-0.021	0.110 (0.258)	0.021
Meister	0.029	-0.496 (0.389)	-0.074	0.193 (0.516)	0.047
Fachschule	0.279	-0.941** (0.233)	-0.144	0.302 (0.303)	0.083
Hochschule	0.105	-0.900** (0.306)	-0.142	-0.345 (0.492)	-0.018
Region:					
Mecklenburg	0.131	0.232 (0.282)	0.040	-0.089 (0.418)	-0.020
Brandenburg	0.142	-0.309 (0.291)	-0.053	-0.001 (0.399)	0.011
Sachsen-Anhalt	0.172	0.127 (0.271)	0.027	0.079 (0.387)	0.006
Thueringen	0.156	-0.048 (0.276)	0.005	0.114 (0.392)	0.018
Sachsen	0.314	-0.290 (0.258)	-0.055	-0.119 (0.369)	-0.005
Industry:					
Agriculture	0.070	0.426* (0.256)	0.103	0.479 (0.343)	0.051
Mining	0.036	0.137 (0.369)	0.011	-0.318 (0.635)	-0.043
Metal	0.117	0.700** (0.223)	0.111	-0.522 (0.402)	-0.082
Other Manf.	0.122	0.743** (0.212)	0.162	0.195 (0.311)	-0.008
Construction	0.033	0.218 (0.382)	0.030	-0.259 (0.566)	-0.039
Distribution	0.149	0.589** (0.200)	0.138	0.518** (0.259)	0.048
Transport	0.050	-1.270** (0.531)	-0.162	0.097 (0.406)	0.051
Employment:					
Part-time	0.231	0.196 (0.156)	0.035	-0.035 (0.226)	-0.012
Short-time	0.189	0.966** (0.147)	0.208	0.183 (0.250)	-0.020
Private	0.043	0.046 (0.332)	-0.010	-0.405 (0.545)	-0.049
West	0.065	-0.191 (0.274)	-0.036	-0.088 (0.422)	-0.005

Table 5.7b (continued)

Establishment Size (No. of Employees)					
200-1000	0.381	-0.015 (0.166)	-0.003	-0.001 (0.247)	0.000
< 200	0.368	-0.038 (0.181)	-0.012	-0.133 (0.258)	-0.016
Earnings	9.741	-0.022 (0.021)	-0.002	-0.089** (0.032)	-0.005

Diagnostics:

Log L		-1345.9
Log 0		-1546.8
Model Chi^2 (54)		401.7**
% correct predictions	Model	80.6
	Zero	80.6
Sample Size		2523

Note: Standard errors in parentheses. ** denotes significance at 5% level, * significant at 10% level. Sample mean transition probabilities EU=.132, EN=.062.

Table 5.8a

Multinomial Logit Estimates of Unemployment Transitions-
March 1991- November 1991 (Men)

Independent Variable	Sample Mean	U-E Estimate	U-E dP_e/dx_i	U-N Estimate	U-N dP_n/dx_i
Constant		1.302		-4.187**	
		(0.895)		(1.913)	
Age < 25	0.140	0.175	0.028	0.205	0.016
		(0.562)		(1.292)	
Age >= 50	0.287	-0.909**	-0.453	3.828**	0.739
		(0.616)		(1.026)	
Single	0.320	-0.918*	-0.165	-0.848	-0.055
		(0.477)		(0.755)	
Children	0.427	0.279	-0.065	-1.800*	0.244
		(0.451)		(0.923)	
Region:					
Mecklenburg-	0.129	-0.327	-0.284	2.380*	0.512
Vorpommern		(0.755)		(1.431)	
Brandenburg/	0.281	-0.064	-0.200	2.187*	0.391
Sachsen-Anhalt		(0.652)		(0.822)	
Thueringen/	0.489	0.505	-0.017	2.003	0.243
Sachsen		(0.609)		(1.304)	
Education:					
Lehre	0.528	-0.259	-0.068	0.078	0.027
		(0.473)		(0.762)	
Meister/	0.258	-0.719	-0.147	-0.332	-0.002
Fachschule		(0.618)		(0.827)	
Hochschule	0.146	-0.570	-0.085	-0.967	-0.081
		(0.580)		(0.983)	
Income					
Unemployment	4.542	-0.095*	-0.015	-0.101	-0.008
Benefits/100		(0.056)		(0.086)	
Other Income/100	1.327	-0.189**	-0.033	-0.162	-0.010
		(0.073)		(0.108)	

Diagnostics:		
Log L		-144.860
Log 0		-187.267
Model $Chi^2(24)$		84.811**
% Correct		
Predictions	Model	59.0
	Zero	41.5
Sample Size		178

Note: Standard Errors are given in parentheses.
*(**) denotes 10%(5%) Significance Level.
Sample Mean Transition Probabilities UE=0.415, UN=0.197.
Likelihood Ratio test for Male-Female sample split gave a test statistic of 75.4 ($Chi^2(24)_{.05}$=36.4).

Table 5.8b

Multinomial Logit Estimates of Unemployment Transitions- March 1991- November 1991 (Women)

Independent Variable	Sample Mean	U-E Estimate	U-E dP_e/dx_i	U-N Estimate	U-N dP_n/dx_i
Constant		-1.355**		-2.760**	
		(0.680)		(1.055)	
Age < 25	0.103	0.091	0.109	-1.989*	-0.221
		(0.504)		(1.213)	
Age >= 50	0.240	0.215	-0.068	1.334**	0.252
		(0.440)		(0.563)	
Single	0.243	0.276	-0.028	1.043**	0.182
		(0.375)		(0.755)	
Children	0.520	0.047	0.105	-1.340**	-0.241
		(0.352)		(0.681)	
Region:					
Mecklenburg-Vorpommern	0.140	-0.743	-0.122	-0.255	-0.002
		(0.563)		(0.973)	
Brandenburg/ Sachsen-Anhalt	0.230	-0.863	-0.163	-0.053	0.045
		(0.526)		(0.887)	
Thueringen/ Sachsen	0.540	-0.628	-0.139	0.068	0.056
		(0.475)		(0.813)	
Education:					
Lehre	0.593	0.818*	0.160	0.134	-0.032
		(0.446)		(0.564)	
Meister/ Fachschule	0.200	1.077**	0.181	0.740	0.040
		(0.522)		(0.661)	
Hochschule	0.040	1.334*	-0.008	2.356**	0.366
		(0.782)		(1.001)	
Income Unemployment Benefits/100	3.453	0.057	0.009	0.067	0.005
		(0.054)		(0.089)	
Other Income/100	0.843	-0.023	-0.012	0.253	0.027
		(0.081)		(0.103)	

Diagnostics:		
Log L		-237.351
Log 0		-268.657
Model $Chi^2(24)$		62.613**
% Correct Predictions	Model	65.7
	Zero	62.3
Sample Size		300

Note: Standard Errors are given in parentheses.
*(**) denotes 10%(5%) Significance Level.
Sample Mean Transition Probabilities UE=0.260, UN=0.117.

Table 5.9

Multinomial Logit Estimates of NLF transitions March 1991- November 1991 (Men and Women)

Independent Variable	Sample Mean	N-E Estimate	N-E dP_e/dx_i	N-U Estimate	N-U dP_u/dx_i
Constant		-2.147**		-4.146**	
		(0.624)		(0.992)	
Female	0.646	-0.089	-0.012	0.071	0.006
		(0.251)		(0.500)	
Age < 25	0.199	0.622	0.077	0.633	0.039
		(0.381)		(0.541)	
Age >= 50	0.687	-2.743**	-0.447	-0.613	0.006
		(0.530)		(0.710)	
Single	0.337	0.461	0.053	0.550	0.034
		(0.360)		(0.536)	
Children	0.137	1.517**	0.094	3.208**	0.415
		(0.366)		(0.589)	
Education:					
Lehre	0.392	0.535*	0.060	0.727	0.045
		(0.279)		(0.533)	
Meister/Fachschule	0.183	1.041**	0.154	0.360	0.010
		(0.416)		(0.707)	
Hochschule	0.065	0.999**	0.166	-0.178	-0.023
		(0.487)		(0.896)	
Region:					
Mecklenburg	0.111	0.377	0.060	-0.988	-0.050
		(0.507)		(0.875)	
Sachsen-Anhalt/ Brandenburg	0.359	0.151	0.023	-0.417	-0.028
		(0.451)		(0.682)	
Thueringen/ Sachsen	0.462	-0.162	0.025	-0.792	-0.112
		(0.442)		(0.666)	
Income:					
Other Income/100	5.159	-0.124**	-0.010	-0.248**	-0.029
		(0.052)		(0.113)	

Diagnostics:		
Log L		-364.544
Log 0		-595.586
Model $Chi^2(24)$		462.084**
% Correct Predictions	Model	88.95
	Zero	86.36
Sample Size		1276

Note: Standard Errors are given in parentheses.
*(**) denotes 10%(5%) Significance Level.
Sample Mean Transition Probabilities NE=0.109, NU=0.027.
Likelihood Ratio test for Male-Female sample split gave a test statistic of 25.2 ($X^2(22)_{.05}$=33.9).

Table 5.A1

Attrition

	Frequency (%)
Waves 1,2,3,4	62.9
Waves 1,2,3	8.6
Waves 1,2	5.5
Waves 1	10.9
Fragmented Participation	11.5
Migrants	0.6

Sample size:10751

Table 5.A2
Multinomial Logit Estimates of Employment Transitions-Including Future Attriters: November 1990 - March 1991 (Men)

Independent Variable	Sample Mean	E - U Estimate	E - U dP_u/dx_i	E - N Estimate	E - N dP_n/dx_i
Constant		-3.203** (0.601)		-3.974** (0.960)	
Age < 25	0.126	-0.026 (0.317)	-0.018	0.261 (0.669)	0.040
Age >= 50	0.251	0.111 (0.278)	0.041	2.203** (0.400)	0.373
Single	0.258	0.529** (0.242)	0.018	-0.055 (0.408)	0.011
Children	0.465	0.362 (0.234)	0.031	-0.179 (0.394)	-0.009
Education:					
Lehre	0.548	0.288 (0.277)	0.021	0.284 (0.415)	0.018
Meister/ Fachschule	0.247	0.118 (0.349)	-0.013	0.535 (0.451)	0.019
Hochschule	0.132	0.430 (0.338)	-0.019	-0.234 (0.594)	-0.018
Region:					
Mecklenburg	0.114	-0.114 (0.407)	0.022	0.400 (0.617)	0.002
Brandenburg	0.160	-1.004** (0.461)	-0.059	0.095 (0.609)	-0.001
Sachsen-Anhalt	0.176	-0.450 (0.404)	-0.008	0.270 (0.596)	0.027
Thueringen	0.168	0.105 (0.379)	0.081	-0.455 (0.657)	-0.017
Sachsen	0.305	-0.162 (0.365)	0.017	-0.300 (0.596)	-0.031
Industry:					
Agriculture	0.098	0.396 (0.337)	0.099	0.601 (0.473)	0.027
Mining	0.073	-0.788 (0.497)	-0.022	0.057 (0.587)	0.039
Metal	0.248	-1.192** (0.362)	-0.119	0.794 (0.515)	-0.033
Other Manf.	0.123	-0.172 (0.342)	0.061	-0.373 (0.556)	-0.017
Construction	0.135	-0.133 (0.341)	0.023	-0.467 (0.568)	-0.025
Distribution	0.065	0.176 (0.367)	0.075	-0.321 (0.699)	-0.011
Transport	0.095	-1.055** (0.509)	-0.094	-0.124 (0.568)	0.002
Employment:					
Part-time	0.023	0.262 (0.490)	0.014	-0.046 (0.781)	-0.012
Short-time	0.208	0.842** (0.224)	0.166	0.699** (0.287)	0.020
Private	0.053	0.461 (0.358)	0.101	0.107 (0.761)	0.051
West	0.094	0.267 (0.319)	0.043	-0.519 (0.620)	-0.034

Table 5.A2 (continued)

Establishment Size (no. of employees)					
200-1000	0.400	-0.077	0.003	-0.266	0.003
		(0.239)		(0.321)	
< 200	0.243	-0.004	0.015	-0.666	-0.033
		(0.273)		(0.430)	
Earnings	12.323	-0.036	-0.002	-0.085**	-0.002
		(0.024)		(0.039)	
Future Attriters	0.230	0.233	0.031	-0.123	0.016
		(0.212)		(0.352)	

Diagnostics:

Log L		-768.7
Log 0		-866.6
Model Chi^2 (56)		195.7**
% correct predictions	Model	94.5
	Zero	94.4
Sample Size		3471

Note: Standard errors in parentheses. ** denotes significance at 5% level, * significant at 10% level. Sample mean transition probabilities EU=.036, EN=.019.
A Chi^2-Independence test for random variables "attrition" and "end state in March 91" produced a statistic of 4.018 ($Chi^2(2)_{.05}$=5.991).

Table 5.A3
Multinomial Logit Estimates of Employment Transitions-
Including Future Attriters: November 1990 - March 1991 (Women)

Independent Variable	Sample Mean	E - U Estimate	E - U dP_u/dx_i	E - N Estimate	E - N dP_n/dx_i
Constant		-3.615** (0.591)		-4.610** (0.899)	
Age < 25	0.113	0.176 (0.295)	-0.018	0.574 (0.626)	0.040
Age >= 50	0.199	0.179 (0.251)	0.041	2.914** (0.470)	0.373
Single	0.263	-0.149 (0.214)	0.018	0.234 (0.306)	0.011
Children	0.505	0.314 (0.200)	0.031	0.067 (0.486)	-0.009
Education:					
Lehre	0.500	-0.033 (0.231)	0.021	0.339 (0.339)	0.018
Meister/ Fachschule	0.296	-0.475* (0.286)	-0.013	-0.070 (0.429)	0.019
Hochschule	0.097	-1.004** (0.505)	-0.019	-0.012 (0.690)	-0.018
Region:					
Mecklenburg	0.126	0.427 (0.454)	0.022	0.471 (0.593)	0.002
Brandenburg	0.147	-0.004 (0.467)	-0.059	-0.390 (0.576)	-0.001
Sachsen-Anhalt	0.170	0.288 (0.444)	-0.008	0.264 (0.513)	0.027
Thueringen	0.155	0.983** (0.427)	0.081	0.150 (0.528)	-0.017
Sachsen	0.315	0.517 (0.418)	0.017	-0.423 (0.512)	-0.031
Industry:					
Agriculture	0.069	0.573* (0.311)	0.099	0.016 (0.498)	0.027
Mining	0.034	0.405 (0.448)	-0.022	0.424 (0.667)	0.039
Metal	0.119	-1.005** (0.411)	-0.119	-0.454 (0.546)	-0.033
Other Manf.	0.120	0.728** (0.259)	0.061	0.084 (0.433)	-0.017
Construction	0.031	0.574 (0.441)	0.023	0.302 (0.662)	-0.025
Distribution	0.153	0.603** (0.238)	0.075	0.031 (0.392)	-0.011
Transport	0.049	0.826 (0.614)	-0.094	-0.239 (0.649)	0.002
Employment:					
Part-time	0.224	0.021 (0.200)	0.014	-0.206 (0.319)	-0.012
Short-time	0.192	0.975** (0.191)	0.166	0.065 (0.349)	0.020
Private	0.042	0.519 (0.342)	0.101	1.167** (0.529)	0.051
West	0.067	0.402 (0.324)	0.043	-0.334 (0.637)	-0.034

Table 5.A3 (continued)

Establishment Size (no. of employees)					
200-1000	0.380	0.130	0.003	0.393	0.003
		(0.233)		(0.362)	
< 200	0.366	0.378	0.015	-0.006	-0.033
		(0.240)		(0.396)	
Earnings	9.606	-0.048*	-0.002	-0.109**	-0.002
		(0.028)		(0.046)	
Future Attriters	0.203	0.154	0.031	0.472	0.016
		(0.193)		(0.308)	

Diagnostics:

Log L		-870.3
Log 0		-1002.3
Model Chi^2 (56)		264.0**
% correct predictions	Model	92.3
	Zero	92.3
Sample Size		3167

Note: Standard errors in parentheses. ** denotes significance at 5% level, * significant at 10% level. Sample mean transition probabilities EU=.036, EN=.019.
A Chi^2-Independence test for random variables "attrition" and "end state in March 91" produced a statistic of 2.063 ($Chi^2(2)_{.05}$=5.991).

Table 5.A4

Multinomial Logit Estimates of Unemployment Transitions- Including Future Attriters: November 1990 - March 1991 (Men and Women)

Independent Variable	Sample Mean	U-E Estimate	U-E dP_e/dx_i	U-N Estimate	U-N dP_n/dx_i
Constant		-0.955* (0.569)		-4.974** (1.220)	
Female	0.580	-0.941** (0.266)	-0.173	-0.235 (0.347)	0.011
Age < 25	0.121	0.773** (0.386)	0.042	1.550 (1.080)	0.235
Age >= 50	0.337	-0.255 (0.393)	-0.221	3.403** (0.794)	0.618
Single	0.297	-0.205 (0.319)	-0.009	-0.734 (0.488)	-0.089
Children	0.410	0.634* (0.324)	0.200	-1.868 (1.109)	-0.271
Region:					
Mecklenburg-Vorpommern	0.119	-0.608 (0.480)	-0.155	1.213 (0.938)	0.262
Brandenburg/ Sachsen-Anhalt	0.331	-0.327 (0.385)	-0.155	1.911** (0.822)	0.349
Thueringen/ Sachsen	0.434	-0.683* (0.381)	-0.186	1.352* (0.804)	0.239
Education:					
Lehre	0.550	0.196 (0.366)	0.029	0.188 (0.426)	0.018
Meister/ Fachschule	0.239	0.726* (0.413)	0.145	0.094 (0.477)	-0.023
Hochschule	0.062	0.342 (0.508)	0.042	0.474 (0.795)	0.157
Future Attriters	0.301	-0.348 (0.282)	-0.033	-0.824* (0.468)	-0.095

Diagnostics:

Log L		-322.488
Log 0		-411.287
Model $Chi^2(24)$		177.597**
% Correct Predictions	Model	70.9
	Zero	69.7
Sample Size		502

Note: Standard Errors are given in parentheses.
*(**) denotes 10%(5%) Significance Level.
Sample Mean Transition Probabilities UE=0.175, UN=0.127.
A Chi^2-Independence test for random variables "attrition" and "end state in March 91" produced a statistic of 12.292 ($Chi^2(2)_{.05}$=5.991).

Table 5.A5

Multinomial Logit Estimates of NLF transitions-
Including Future Attriters: Nov 90- March 91 (Men and Women)

Independent Variable	Sample Mean	N-E Estimate	N-E dP_e/dx_i	N-U Estimate	N-U dP_u/dx_i
Constant		-2.627**		-3.946**	
		(0.577)		(1.036)	
Female	0.687	0.278	0.031	0.331	0.024
		(0.304)		(0.535)	
Age < 25	0.266	0.121	0.028	-0.867*	-0.066
		(0.292)		(0.505)	
Age >= 50	0.593	-2.564**	-0.330	-2.093**	-0.138
		(0.473)		(0.717)	
Single	0.385	0.079	-0.016	0.371	0.035
		(0.308)		(0.463)	
Children	0.191	0.848**	0.088	1.399**	0.144
		(0.349)		(0.597)	
Education:					
Lehre	0.379	0.635**	0.083	0.266	0.013
		(0.294)		(0.494)	
Meister/Fachschule	0.157	1.138**	0.192	-0.108	-0.029
		(0.380)		(0.668)	
Hochschule	0.056	0.461	0.083	-1.087	-0.069
		(0.490)		(1.098)	
Region:					
Mecklenburg	0.119	-0.581	-0.077	0.864	0.110
		(0.497)		(0.833)	
Sachsen-Anhalt/ Brandenburg	0.337	-0.307	-0.035	-0.282	-0.020
		(0.406)		(0.850)	
Thueringen/ Sachsen	0.474	-0.465	-0.064	0.232	0.027
		(0.393)		(0.782)	
Future Attriters	0.237	0.274	0.041	-0.227	-0.023
		(0.250)		(0.452)	

Diagnostics:		
Log L		-407.659
Log 0		-524.517
Model $Chi^2(24)$		233.717**
% Correct Predictions	Model	91.65
	Zero	91.71
Sample Size		1581

Note: Standard Errors are given in parentheses.
*(**) denotes 10%(5%) Significance Level.
Sample Mean Transition Probabilities NE=0.063, NU=0.020.
A Chi^2-Independence test for random variables "attrition" and "end state in March 91" produced a statistic of 2.566 ($Chi^2(2)_{.05}$=5.991).

Figure 5.1
Unemployment Stocks in Eastern Germany
September 1990 - May 1992

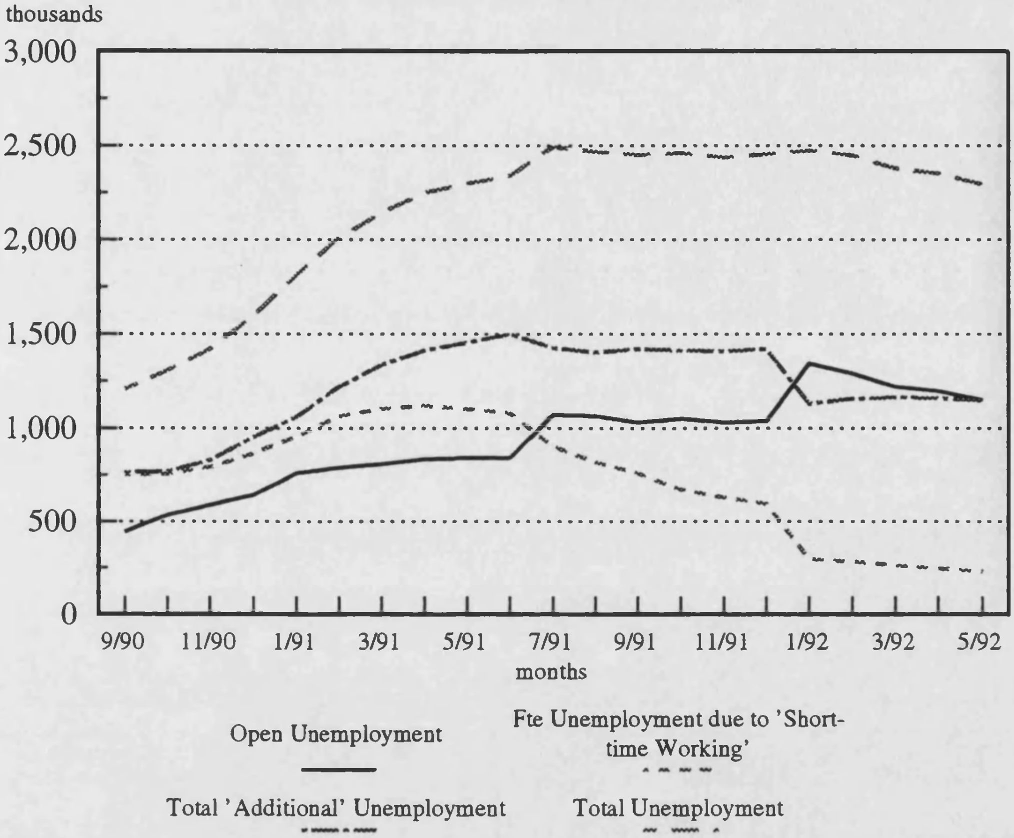
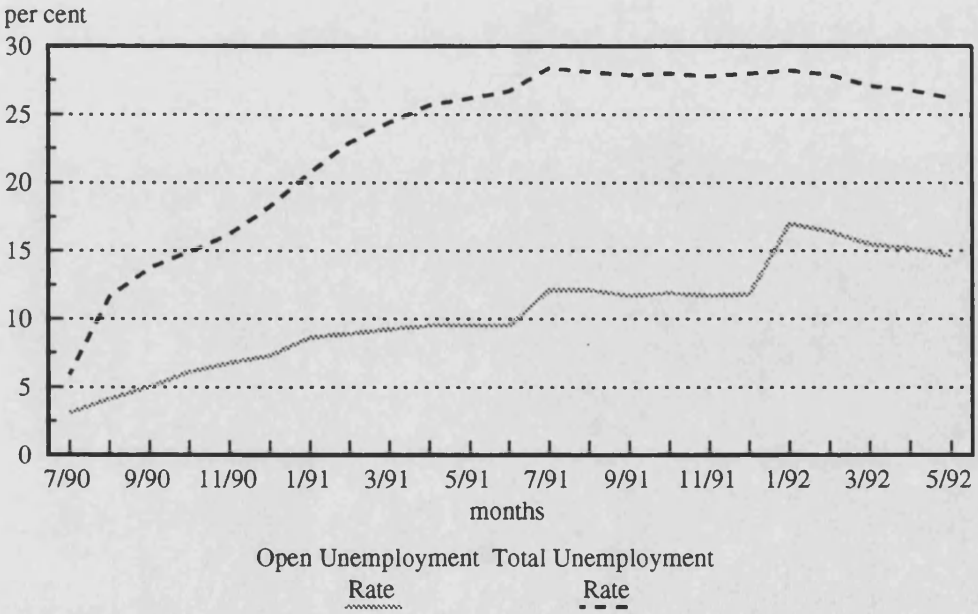


Figure 5.2
Unemployment Rates in Eastern Germany
September 1990 - May 1992



Source: Bundesanstalt fuer Arbeit

Figure 5.3
Gross Flows into and out of Open Unemployment
Eastern Germany: July 1990 - May 1992

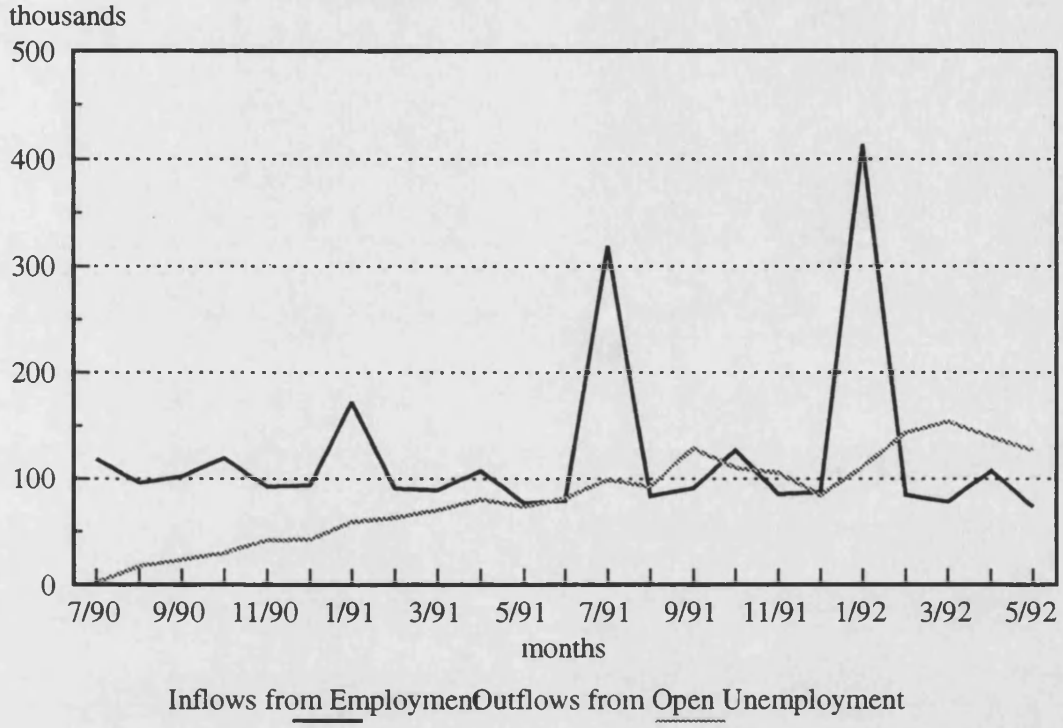
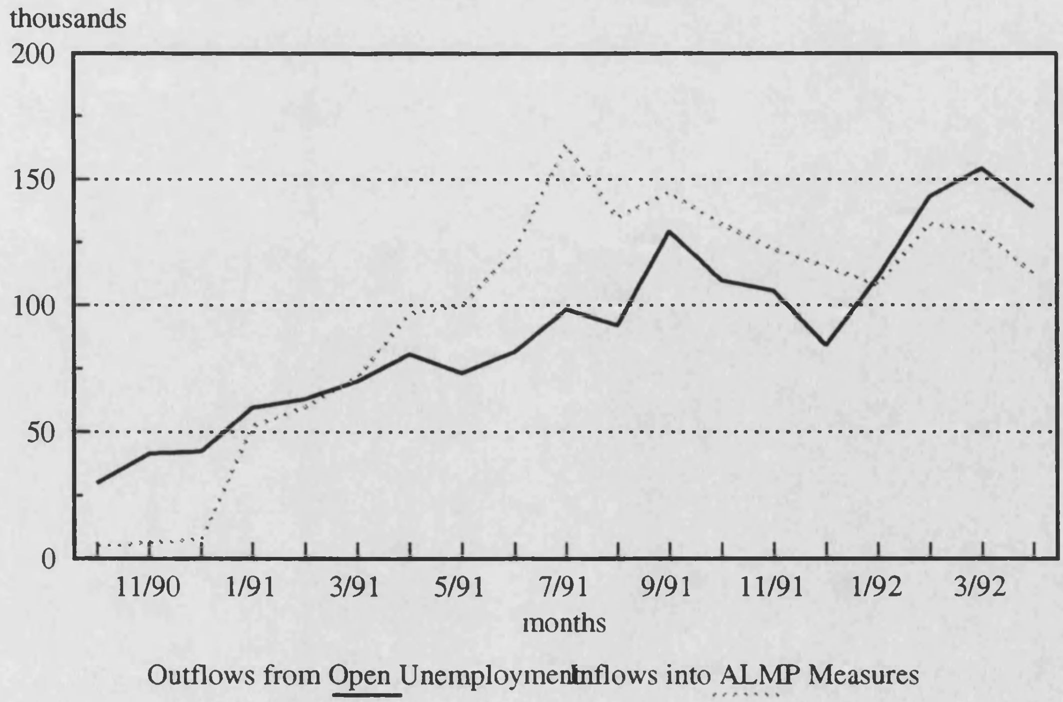


Figure 5.4
Unemployment Outflows and Inflows into ALMP
Measures. Eastern Germany: October 90 - April 92



Source: Bundesanstalt fuer Arbeit

Figure 5.5

Past and Future Distributions of Working Age Population by Sector. Eastern Germany

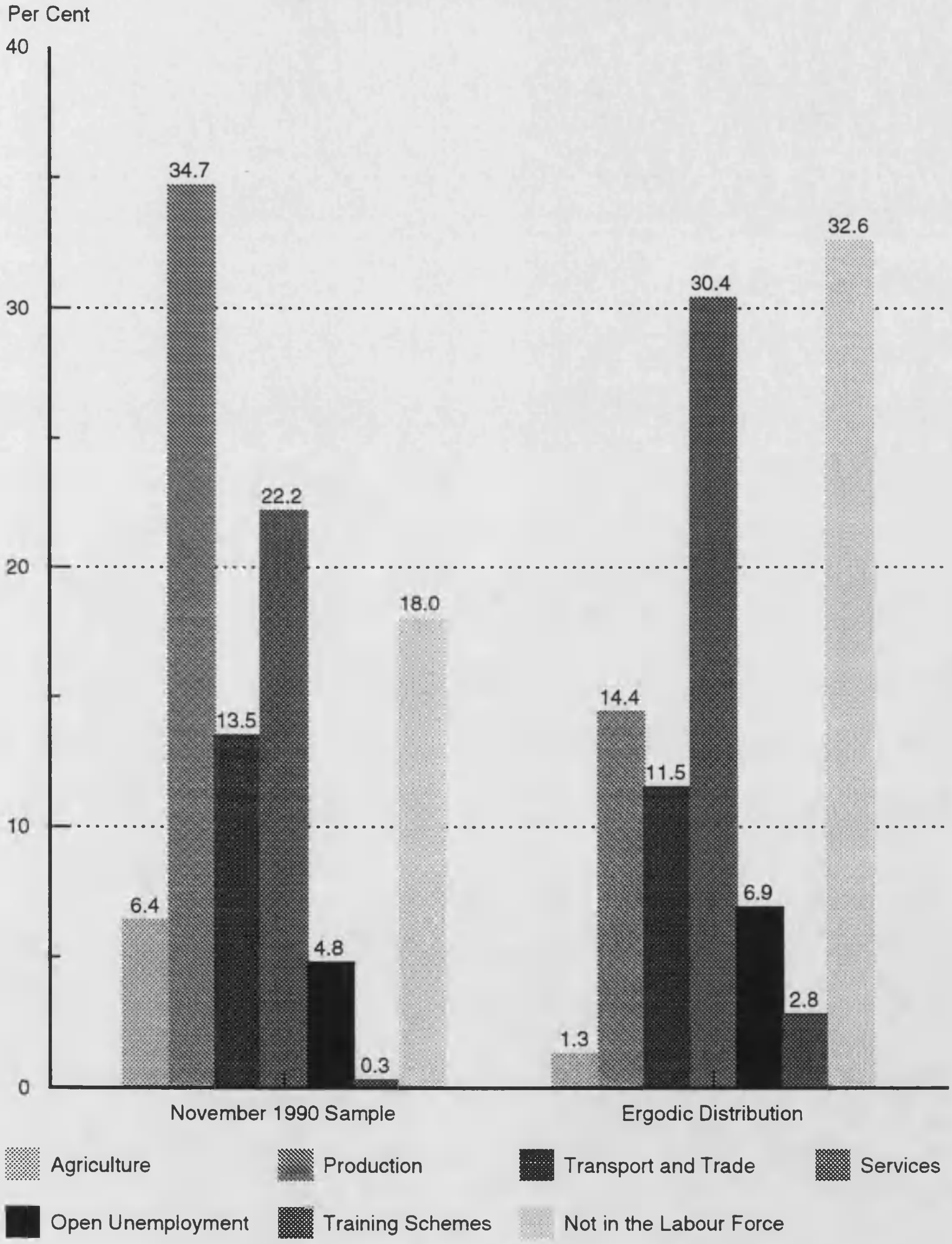
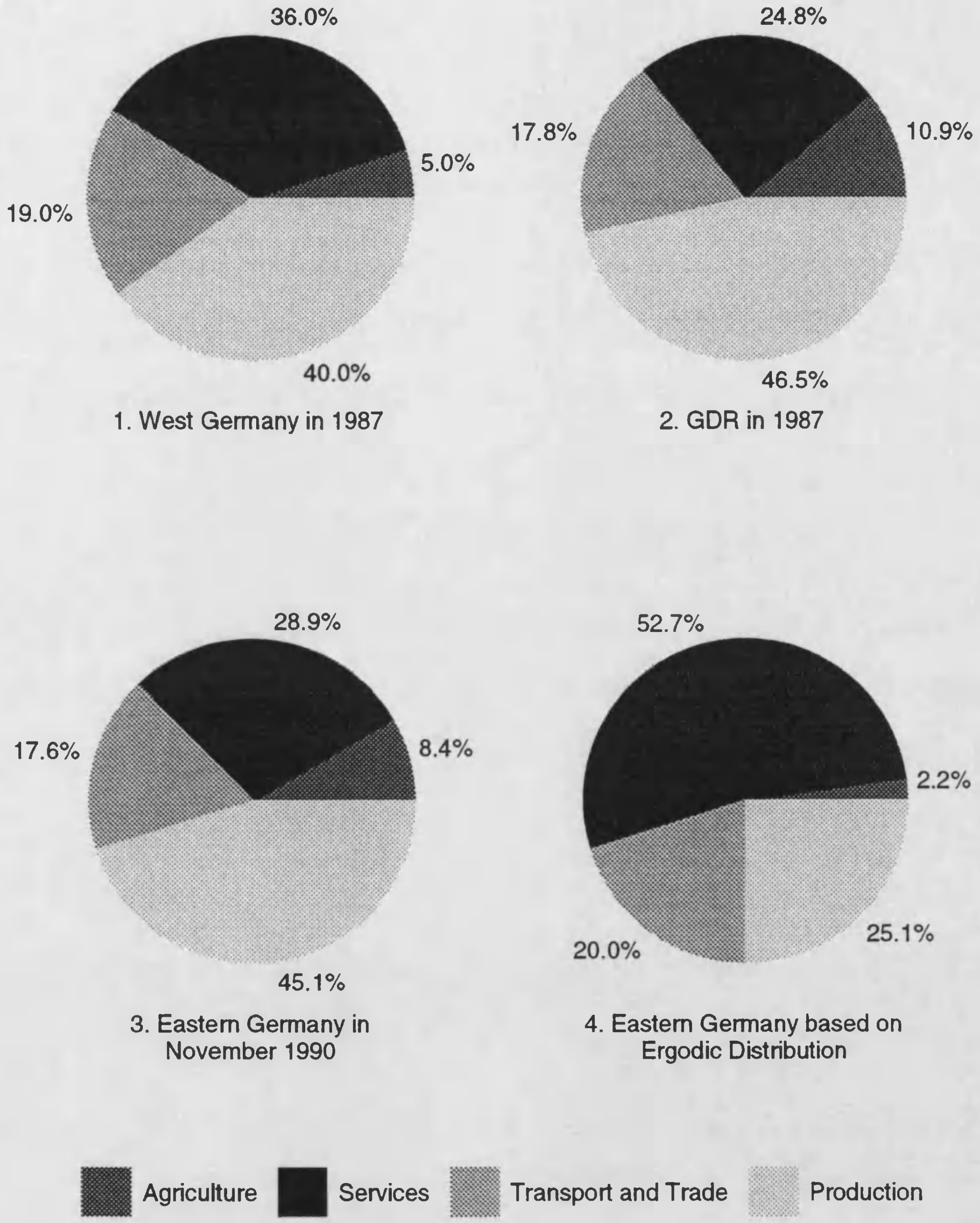


Figure 5.6

Past & Future Employment Distributions by Sector



Source: Charts 1,2 are based on Blaschke et al. (1990); Charts 3,4 on own calculations.

Chapter 6

Labour Market Flows and the Evaluation of Labour Market Policies in Poland

I Introduction

This chapter examines three issues concerning the Polish labour market using aggregate Voivodship-level panel data. First, for the period February 1991 to December 1992, we test for the existence of a well defined matching function in the Polish labour market which brings together unemployed workers and vacant jobs. Secondly, we investigate whether the change in the benefit system at the beginning of 1992 induced stronger search efforts by the unemployed resulting in increased levels of hirings. This change consisted of a regime switch from earnings-related benefits to a flat rate system paying approximately 36% of the average wage to all those unemployed with previous work experience . Again, the data set spanning the months February 1991 to December 1992 is used for this test. Thirdly, for 1992, when stocks of ALMP measures reached statistically significant levels, the impact of these measures on hirings of the unemployed is analyzed. This chapter can also be thought of as an exercise in the exploration of available aggregate Polish labour market data. Not much is known about what these data actually mean and our econometric work might help provide a partial answer to this question.

The analysis of labour market policies undertaken here is narrow in the following sense. Policies which deal with industrial relations, crucial for wage determination and dispersion, are not addressed here. Only labour market policies as defined by the OECD (see Jackman et al.(1990), page 2) are discussed.

The next section will discuss hirings of the unemployed and outflows from unemployment at national level, while section III gives a brief summary of the most pertinent features of Polish passive labour market policies and describes the ALMP measures used most in 1992. In Section IV the three above mentioned topics will be empirically investigated. To facilitate this investigation, the transition methodology employed in chapters 1 and 2 will be adapted to the panel nature of the Polish Voivodship-level data. Section V concludes.

II Monthly Aggregate Flows in 1992 in the Polish Labour Market

Since January 1992, data on new unemployment registrants, i.e. inflows into unemployment has become available. Monthly outflows from unemployment into stable employment, i.e. hirings from the stock of unemployment, have been available since the beginning of 1991. For further analysis it is crucial to understand the Polish measure of hirings. This measure denotes only those flows from unemployment into employment which result in a match between an unemployed person and a "genuine" job, i.e. a job which is posted by a private or socialized firm because it thinks it profitable to do so. Flows from unemployment into employment slots created by the central government or by local authorities do not appear in our measure of hirings. In order to be able to compare overall outflows from unemployment[1] and hirings the analysis is confined to 1992. The basic stock and flow data underlying this analysis are given in Table 6.A1.

Monthly flows in the Polish labour market are presented for males and females jointly and separately in Figures 6.1, 6.2 and 6.3. Total unemployment rose from 2,211,753 at the beginning of the year to 2,509,342 in December 1992. Most of this rise can be explained by much larger inflows than outflows in the summer months, when school leavers entered the labour force. In the rest of the year, inflows were slightly higher than outflows apart from March and October. There was a larger absolute increase in female unemployment (178,057) than in male unemployment (119,532), which is demonstrated by the larger net sum of "plus - areas" (areas where the upper bound is inflows) and "minus - areas" (areas where the upper bound is outflows) in Figure 6.3 compared to the net sum in Figure 6.2.

It is worth noting that hirings are much lower than outflows from unemployment, not only for women but also for men. On average monthly hirings constituted 59% of outflows for men, 51% for women and 56% for both men and women.[2] In the Polish context, outflows from unemployment can have five main destinations: (a) "genuine" employment , (b) employment sponsored by the government, (c) employment in the underground economy, (d) the state of inactivity and (e) emigration. With a large underground economy (cf. Bednarski (1992)) and presumably substantial migratory flows out of the country[3] the large proportion of outflows not explained by hirings, which after all only constitute flows into destination (a), appears less surprising. It is possible that some of the unemployed who flow into "genuine" jobs are not taken account of in our measure of hirings. This measurement error should, however, not be large given that there are four other destinations of outflows from unemployment and that not only flows into (d) but also into (c) and (e) can be assumed to be substantial. While our measure of hirings is a lower bound of flows from unemployment into "genuine" jobs, it is nevertheless the variable which should be chosen as the dependent variable when estimating hiring functions in the Polish labour market. Polish overall outflows from unemployment have a very large component which is orthogonal to flows into "genuine" jobs and should, therefore, not be chosen as the dependent variable in the estimation of such functions.

The relative magnitude of the outflows from unemployment can best be assessed by looking at monthly overall outflow rates from unemployment[4] (Figure 6.4). The yearly averages of monthly outflow rates are 5.2 and 3.5 percentage points for men and women respectively and 4.3 for men and women jointly. Thus, the outflow rate for men is on average 48% higher than that for women. This different experience in the labour market experience is also reflected in the job finding rate of the unemployed[5] when disaggregated by gender (cf. Figure 6.5). The ratio of the average monthly job finding rate for men over the average monthly job finding rate for women is 3% / 1.7% = 1.72.

Compared to most OECD countries, the Polish average monthly outflow rate from unemployment, for men and women combined, is extremely low. For example in 1991 Austria, Norway and the U.K. had average monthly outflow rates of 25.1, 20.6 and 12.3 percent respectively. Only France had in 1991 a similarly low outflow rate as Poland, namely 5.5%. On the other hand, the 1992 Polish average monthly inflow rate into unemployment of 0.72% is lower than in the same four OECD countries with estimated inflow rates for 1991 of 1.38% for both Austria and France, 1.65% for Norway and 1.31% for the U.K.[6]. Further country comparisons will be made in section IV where we look at averages of Voivodship-level data.

Since economic activity picked up in Poland in 1992, we can assume that monthly outflow rates in 1990 and 1991 might have been somewhat lower in these years relative to 1992. Our conjecture in chapter 4 that for most months between January 1990 and June 1991 the steady rise in the stock of unemployment was due to small inflows being slightly larger than very small outflows[7] seems to be borne out by the data of 1992. In general, these data seem to indicate that there were very limited flows between the different states of the labour market during the first three years of the reform period in Poland.

III Changes in the Benefit Structure in the Years 1990 - 1992 and Active Labour Market Policies in 1992

An extended discussion of Polish active and passive labour market policies in 1990 and 1991 can be found in Chilosi (1991, 1993) and Lehmann (1991, 1992), while some general lessons from western experience for Polish labour market policies have been presented in Lehmann and Rutkowski (1991). Here, we focus on changes in employment legislation which might have affected the search behaviour of the unemployed and describe active labour market policies in 1992.

The initial unemployment benefit system introduced at the end of 1989 was open-ended, earnings-related and not contingent on previous work experience. Its details are described in Appendix 1 of chapter 4. Three major changes have occurred since the inception of this system. In July 1990 the 'Employment Act' was amended, restricting benefit eligibility to persons who had worked at least 180 days in the last 12 months. This new provision mainly excluded school leavers, but also spouses of the unemployed. In November 1991 President Wałęsa signed the 'Act on the Change of the Employment Act'. Its main provision ended benefits for those individuals with an uninterrupted spell of unemployment exceeding 12 months. However, at the same time, the Sejm passed a law for all those affected by this provision, extending benefit payments for one more year until December 1992. Only since December 1992 have benefits been removed, in principal, for those with spells longer than 12 months. On the other hand, the Canadian system of flexible benefit payments (cf. Ham and Rea (1987)) continues to be applied selectively in employment office districts where unemployment rates exceed a certain specified threshold. Benefits are then paid for a total of 18 months.

The move to limit benefit payments in principal to 12 months was justified on the grounds that it would increase search efforts, lower reservation wages and consequently drive down the equilibrium unemployment rate. Atkinson and Mickleright (1989) review the theoretical and empirical literature on 'disincentive issues' of unemployment compensation systems. They conclude that the above view, postulating an unequivocal positive incentive effect of the shortening of benefit payments on the unemployment rate, is rather tenuous and depends on restrictive assumptions about movements between labour market states. In recent empirical literature from the United States and Britain, different conclusions are reached about the effect of benefit entitlements on the equilibrium unemployment rate. For the U.S. Meyer (1990) and Katz and Meyer (1990) look at what happens when benefits lapse. They find that hazard rates from unemployment are strongly affected by the remaining duration of benefit entitlement. As the unemployed reach the point of benefit exhaustion their hazard rates show a dramatic upward shift. On the other hand, Wadsworth (1991) investigates the effect of benefit entitlement on search effort. He establishes a significant positive link between being a benefit recipient and search effort, implying more job offers for those entitled to benefits.

The last important change in employment legislation whose effect on hirings is investigated in section IV, is the switch of benefit payment regimes which took place at the beginning of 1992. An earnings-related regime which some economists attacked as too generous[8] was substituted by a flat rate system paying about 36% of the average wage, slightly lower than the minimum wage. Because of a 'fiscal squeeze' which had started at the beginning of 1991 and became more serious throughout the year, the government in its provisional budget for 1992 imposed the flat rate regime. To our knowledge benefits were already being paid at reduced levels in the first quarter of 1992. For the second quarter this regime switch was written into law.

Three ALMP measures which the government mainly employed in 1992 are evaluated: Further Training and Retraining, 'Prace Interwencyjne' ('Intervention Works') and Public Works. Before describing these measures, the pattern of labour market policy expenditures as it evolved in the first three years of reform will be briefly discussed.

The percentage share of expenditures on ALMP from the 'Labour Fund'[9] declined from 32.1% of the total in 1990 to 7% in 1991 and fell further to 4.7% in 1992. The steady rise in the number of unemployment benefit recipients forced the government to allocate an ever greater share of total expenditures for benefit payments. This share rose from 51.1% in 1990 to 82% in 1991 and reached 86.3% in 1992. As far as ALMP expenditures are concerned there has been a dramatic shift in the composition of the measures employed. While in 1990 81% of ALMP expenditures went on loans to set up a business and for firms to hire additional workers[10], the share of these measures fell to 43% and 21% in 1991 and 1992 respectively. The share of Further Training and Retraining measures, on the other hand, grew from 1% in 1990 to 10% in 1991 and reached 17% in 1992. 'Prace Interwencyjne' had a share of 18%, 47% and 45% in the first three years of reform, while Public Works were only introduced in 1992 and made up 17% of all ALMP expenditures in this year. The last three measures whose combined share of total ALMP expenditures rose from 19% in 1990 to 79% in 1992 will now be briefly described:

Public Works

Local authorities employ those with uninterrupted unemployment spells of more than 6 months on public projects. Most projects are intended to expand or maintain the public infrastructure. Some workers find employment on projects of environmental protection or amelioration. The duration of these jobs cannot exceed 6 months and it is the expressed intention of the government to rotate among the long-term unemployed. It is important to note that the nature of Public Works is different from that of pre-World-War-Two Public Works which were organised in a quasi-military fashion. Today's Public Works are strongly decentralized and local authorities are encouraged to suggest worthwhile projects. There are no nation-wide data on average remuneration, but there is some casual evidence from Ministry of Labour officials that people employed on Public Works receive wages that are far above the minimum wage.

Prace Interwencyjne (Intervention Works)

This term is somewhat misleading. Firms (private or state-owned) can approach the local employment council (Polish: Rada Zatrudnienia) and ask for subsidized additional work places. In order to qualify for this scheme the firm has to have more than 10 employees and must not have released workers in the last 12 months. Again, employment is not to exceed 6 months. The state pays a wage subsidy to the firm equal to the level of benefits and often firms or local employment councils pay additional wages to these workers. There is casual evidence that some employees on this scheme earn more than colleagues employed permanently.

Further Training and Retraining

Private and public agencies are paid a fee to train some of the unemployed who in turn are paid an allowance while on the course. As is shown below, many of these courses have a very short duration and casual evidence tells us that the human capital enhancing content of the majority of such courses might be dubious.

Unemployed persons entering any of these schemes leave the register, i.e. flow out of unemployment. However, these outflows and the hiring flows are disjoint sets and these measures can only indirectly influence hirings. The indirect impact of these measures is discussed in section IV.

Given the small percentage share of ALMP expenditures in 1992, one might question the feasibility of statistical impact analysis. However, as Figure 6.6 reveals, the combined inflows of unemployed into Intervention and Public Works schemes were quite substantial and their combined stocks (cf. Figure 6.7) were not negligible relative to hirings in the last four months of 1992. We will try to exploit this sudden rise in the stock data in our evaluation regressions.[11] It should also be noted that the stocks were much larger than the inflows, indicating quite lengthy steady state mean durations of these two measures[12]. Inflows from unemployment into Further Training and Retraining, which also rose sharply in the last 4 months of 1992, were of the same magnitude as the inflows of the other two measures (cf. Figures 6.6 and 6.8). Particularly interesting is the fact that monthly inflows and stocks of Further Training and Retraining participants (Figure 6.9) were of the same magnitude. This suggests very short steady state mean durations for these training measures[13].

IV Estimation of Polish Hiring Functions and the Evaluation of Passive and Active Labour Market Policies

1. The adaptation of Transition Methodology to Polish Panel Data

When using the notion of a matching function (cf. e.g. Pissarides (1990)), where a mapping from the stocks of vacancies and unemployment to the flow of hirings is postulated, we need to modify the approach taken in chapters 1 and 2 if we want to model the determination of the level of hirings in the Polish labour market. These modifications need to be made because of severe data limitations but also because of the panel nature of our data.

Let H_{it} be the number of hirings from the stock of unemployment during a certain time interval t taking place in Voivodship i. Recall that hirings are flows from unemployment into genuine jobs and exclude flows into government sponsored jobs. Let V_{it} and U_{it} be the stock of notified vacancies and of registered unemployed at the beginning of time period t in Voivodship i. Also, let V^{P}_{it} be the stock of vacancies provided through job creation programmes and TM_{it} the stock of training measures slots in Voivodship i, again both measured at the beginning of time interval t. Furthermore, let

$$V^{*}_{it} = V_{it} + \alpha V^{P}_{it} \tag{6.1}$$

V^{*}_{it} consists of notified vacancies and the sum of vacancies provided through job creation schemes. The two job creation schemes prevalent in Poland are 'Prace Interwencyjne'('Intervention Works') and Public Works programmes[14]. V^{P}_{it} is pre-multiplied by the parameter α to indicate that the stocks of notified vacancies and of vacancies provided through job creation schemes might be mapped very differently to the flow of hirings. On a priori grounds it is actually not clear whether the space of admissible values of α should be restricted to its non-negative part. Since the Polish measure of hirings only gives flows from unemployment into genuine and viable jobs many of which might pay wages close to unemployed workers' reservation wages, it is conceivable that an increase in "public" vacancies in Voivodship i will actually increase reservation wages of some unemployed and thus lower hirings. Finally, let

$$c^{*}_{it} = c_{t}(1 + \beta TM_{it}),\ where\ \beta \geq 0\ and\ 0 < c^{*}_{it} \leq 1 \tag{6.2}$$

The average search effectiveness of the stock of unemployment, assumed to be

Voivodship-specific, is expressed as c^*_{it}. Negative values of the parameter β are assumed inadmissible as an increase in training measures cannot result in decreased average search effectiveness of the unemployed[15]. We make the strong assumption that this search effectiveness varies across Voivodships solely because levels of training measures vary across them, while the search effectiveness of the stock of unemployment in the absence of such measures, denoted by c_t, is only time variant. A specification like the one in (6.2) is imposed on us by the fact that we have only one data point from the Live Register on the duration structure of unemployment at the Voivodship level, which would constitute the base for the construction of a search effectiveness index varying across Voivodships. On the other hand, the stocks of training measures varying across observational units and time are available for 1992. The assumed invariance of c_t across Voivodships, is, however, not only dictated by data constraints but can be justified to a degree by the observation that in 1992 the proportions of long-term unemployment, according to the information at our disposal, seem to vary more across time than across Voivodships[16]. The matching function is assumed to have a <u>general</u> Cobb-Douglas specification with arguments V^* and U. The return to scale properties of the matching technology in the Polish labour market after the onset of reforms is an empirical issue which will be investigated in this section. "Total factor productivity" of this function (cf. Burda (1993b)) is denoted by A_t and an unobserved Voivodship-specific fixed effect by F_i.

Hence the hiring function of the Polish unemployed is given by:

$$H_{it} = F_i A_t c^*_{it} e^{\varepsilon_{it}} V_{it}^{*\delta_1} U_{it}^{\delta_2} \tag{6.3}$$

where i=1,..,49 and t is either an element of$\{T_1\}$ or $\{T_2\}$. T_1 is the set of monthly data points from February 91 to December 92, while T_2 spans the period January 1992 to

December 1992. The error term, entering the hiring function multiplicatively, is assumed to be white noise normally distributed . Taking logs and using equations (6.1) and (6.2) we get

$$\begin{aligned} \ln H_{it} &= \ln F_i + \ln A_t + \ln[c_t(1+\beta TM_{it})] \\ &+ \delta_1 \ln[V_{it}(1+\frac{\alpha V_{it}^P}{V_{it}})] + \delta_2 \ln U_{it} + \varepsilon_{it} \end{aligned} \tag{6.4}$$

For small values of βTM_{it} and $\alpha(V_{it}^P/V_{it})$ we get the approximation

$$\begin{aligned} \ln H_{it} &\approx \ln F_i + \ln A_t + \ln c_t + \delta_1 \ln V_{it} \\ &+ \delta_2 \ln U_{it} + \beta TM_{it} + \frac{\delta_1 \alpha V_{it}^P}{V_{it}} + \varepsilon_{it} \\ &= \ln F_i + \ln A_t^* + \delta_1 \ln V_{it} + \delta_2 \ln U_{it} \\ &+ \delta_3 TM_{it} + \delta_4 \frac{V_{it}^P}{V_{it}} + \varepsilon_{it} \end{aligned} \tag{6.5}$$

where $\delta_3=\beta$, $\delta_4=\delta_1\alpha$ and $\ln A_t^* = \ln A_t + \ln c_t$ is the "augmented total factor productivity" of the hiring function. "Total factor productivity" is augmented by the time variant average search effectiveness of the stock of unemployment. To control for strong serial correlation present in the data we add a lagged dependent variable, while maintaining that ε is distributed as $N(0,\sigma^2)$. In order to eliminate the unobservable fixed effect we take first differences and arrive at the specification to be estimated

$$\begin{aligned} \Delta \ln H_{it} &= \Delta \ln A_t^* + \gamma \Delta \ln H_{i,t-1} + \delta_1 \Delta \ln V_{it} + \delta_2 \Delta \ln U_{it} \\ &+ \delta_3 \Delta TM_{it} + \delta_4 \Delta \frac{V_{it}^P}{V_{it}} + \Delta \varepsilon_{it} \end{aligned} \tag{6.6}$$

Since $\ln H_{i,t-1}$ is correlated with $\varepsilon_{i,t-1}$ OLS estimation of (6.6) would give inconsistent estimates, hence the need to instrument $\ln H_{i,t-1}$. The unrestricted version of (6.6) will be estimated for the short sample from January to December 1992 and we will employ a General-Methods-of-Moments (GMM) estimator which, under the assumption of no autocorrelation in levels, is most efficient in dynamic panel estimation (Arellano and Bond (1991)). For the longer sample from February 1991 to December 1992, δ_3 is set equal to 0 as stock data on training measures are not available for 1991[17]. For the latter sample, GMM estimation does not produce two-step estimates as the number of instruments is larger than the number of observational units. We use, therefore, the consistent, but less efficient Anderson-Hsiao (AH) estimator, i.e. we use as instruments $\ln H_{i,t-2}$ and $\Delta \ln H_{i,t-2}$ (cf. Anderson and Hsiao (1982)).

The computer programme used in our estimations is DPD developed by Arellano and Bond (1988). One of its attractive features is easy interpretation of the coefficients of included time dummies in a <u>differenced equation when the dependent variable is in logs</u>. In equation (6.6) the inclusion of time dummies allows us to control for and estimate month-to-month growth rates of "augmented factor productivity" of the hiring function.

2. <u>Voivodship-level Data</u>

Summary statistics are given for males and females jointly in Table 6.2. The administrative unit used is the Voivodship rather than the employment office district as the data from the latter unit are presumed to be less reliable[18]. Since data on inflows into unemployment are only available from January 1992[19], data exclusively for 1992 are presented. It should be noted that the averages are taken across all i and t.

The mean U/V ratio implied by the figures equals 75.7, with a rough estimate the monthly mean overall outflow rate from unemployment is 4.3%. Burda (1993b) has presented similar summary statistics for West Germany and the Czech Republic. From his figures we can calculate roughly comparable mean U/V ratios and estimates of mean overall monthly outflow rates for these labour markets. The mean U/V ratios are 5.5 and 2.9 for West Germany and the Czech Republic respectively, while the mean monthly outflow rate estimates are 17.6% and 19.8%.

The experience in West Germany, taken as representative for a labour market in a modern economy, is, according to these statistics, clearly distinct from the experience of the Polish labour market even if one accounts for the fact that the figures for West Germany are averages taken over a boom period. The Czech mean U/V ratio is an average taken over the entire reform period (starting with a value of zero) while the Polish mean U/V ratio is an average of the third year into the reform when Voivodship-specific U/V ratios were high throughout. Nevertheless, it is hard to believe that the vast discrepancy between the Polish and Czech mean U/V ratios is entirely attributable to period-specific variation and not also a sign of a much more severe excess supply regime in the Polish labour market. The fact that the estimate of the mean monthly outflow rate from unemployment is much lower in Poland than in the Czech Republic can certainly be taken as evidence that the experience in the two countries is distinct. Outflow rates from unemployment tend to be low at the beginning of the reform period (cf. chapter 5), hence, ceteris paribus, the Czech estimate could have a downward bias relative to the Polish estimate. The upshot of these inter-country comparisons is that the Polish labour market in 1992 is, on average, characterized by extremely low vacancy rates relative to unemployment rates and relatively low outflow rates from unemployment. Both these facts can be taken as an expression of a much weaker demand for labour in the Polish labour market relative to the labour markets of e.g. West Germany and the Czech Republic.

Two more points need to be made about Table 6.2. First, as was the case with nation-wide data, a large part of the outflows from unemployment (appr. 46%) is not explained by hirings. Secondly, the total mean stock of ALMP measures is very small relative to the mean stock of registered unemployment, but roughly 65% larger than the mean stock of registered vacancies. One interpretation of the latter would be that much of the outflow from unemployment into employment can be attributed to government sponsored schemes and that in this sense, at least in the last months of 1992, ALMP have not been negligible in Poland.

In Tables 6.3 and 6.4 some summary statistics are given by gender. The data show a clear difference in the labour market experience for men and women. The mean stock of unemployment is higher for women and, given lower participation rates, the mean unemployment rate much higher for women than men. Also, the dispersion of unemployment stocks is much greater for women. Apart from unemployment and training, the averages of all other variables are substantially smaller for women than men. Thus, the estimation of disaggregated (by gender) hiring functions seems to be warranted.

3. Issues related to specification and small sample bias

Before presenting our results, some econometric issues related to specification and small sample bias in instrumental variables panel estimation need to be discussed.

When the number of observational units (N) is small, as is the case here where N=49, the standard errors of two-step estimates of coefficients and time dummies might have a small sample downward bias, thus generating spurious increased efficiency of the two-step estimator. A comparison of robust (to heteroscedasticity) one-step and two-step estimates in all estimations for both sample sizes pointed to the existence of such a downward bias. The presented results always show the robust one-step estimates of coefficients as the estimates of their standard errors have no small sample bias. On the other hand, the statistics testing for first and second order serial correlation are unbiased and most efficient with two-step estimation, while the Sargan test, establishing the validity of instruments used, is not available with one-step estimation (cf. Arellano and Bond (1991)). Hence the two-step estimates of the diagnostics statistics are always shown.

The diagnostic statistics in Tables 6.5 to 6.7 and Tables 6.9 to 6.11 allow us to conclude that (6.6) is an acceptable specification of the hiring function no matter which sample we use. For both the longer and shorter sample (T_1 and T_2), whether we look at the aggregated hirings or the (by gender) disaggregated hirings, the test statistic of first order serial correlation which is distributed as asymptotically standard normal is negative and highly significant, while the test statistic for second order serial correlation, also distributed as asymptotically standard normal, is always insignificant at conventional levels. The results with respect to first order serial correlation can be taken as strong evidence that in the levels equation the error term is not generated by a random walk process[20]. If, furthermore, the error term were generated by an AR(1) process in the levels equation, the second order test statitistics for the differenced equation would be significant. The evidence makes it difficult to reject the hypothesis that in the levels equation (6.5) ε_{it} is a white noise variable. On the other hand, neither a random walk process nor an autoregressive process generating the error term seem likely.

Given that white noise ε_{it} is an appropriate assumption for the levels equation, the existence of Voivodship-specific fixed effects and time variant determinants of the levels of hirings common to all Voivodships can now be easily discussed. We estimated equation (6.5) for male, female and total hirings imposing the restriction $\ln F_i=0$ for all i. The results which are not shown here[21] show highly significant first and second order serial correlation test statistics, strongly rejecting the imposed restriction. Therefore, the hirings equation (6.5) needs to be differenced in order to eliminate the unobservable Voivodship-specific effects which give biased coefficient estimates in the levels equation. Finally, in the differenced equation the hypothesis was tested that $\Delta \ln A_t^*=0$ for all t by estimating the equation without time dummies but with a trend variable. The inadmissibility of such restrictions was shown[22] by significant second order serial correlation and by Sargan test statistics rejecting the validity of the set of instruments which did not include time dummies. Thus, a set of time dummies tracking developments common to all Voivodships (what we call "augmented total factor productivity") and Voivodship-specific fixed effects seem to be important determinants of hirings in the Polish labour market and equation (6.6) strikes us as an appropriate specification of (6.3).

4. Results

For the period February 1991 - December 1992[23] we estimated equation (6.6) for females and males jointly and for males and females seperately, imposing the restriction $\delta_3=0$ for the reasons given above. In all these regressions, the estimate of δ_4 was very insignificant, so that we re-estimated (6.6) for the three sets imposing the further restriction $\delta_4=0$. As far as the longer sample is concerned we are not able to detect a statistically significant effect of active labour market policies on the level of hirings.

The results of the estimation of the restricted equation (6.6), presented in Tables 6.5 - 6.7, do not seem to point to the existence of a well behaved matching function in the Polish labour market. In all three regressions, the coefficient on vacancies is completely insignificant and in two out of three cases it has the wrong sign. In the regressions for males and females jointly and for males only the coefficient on unemployment is significant at the 10% or 5% level respectively[24], while the level of female hirings seems to be solely determined by the lagged level of hirings itself. This is further evidence that the experience for unemployed men and women is different in the Polish labour market.

In those regressions where unemployment has some predictive power, the hiring functions seem to exhibit increasing returns to scale in the steady state. The hiring function for males has a steady state coefficient of 2.29 on the log of unemployment, while this coefficient takes the value 1.75 in the hiring function for males and females combined[25]. Below, the null hypothesis that this latter function exhibits CRS will be formally tested.

The main result of these regressions is, however, that, at least for males, the stock of registered unemployment is an important predictor of the level of hirings while the stock of notified vacancies plays no role whatsoever. The interpretation of this result is not necessarily straightforward. One way to approach this result is to take account of the vast discrepancy between the total number of registered unemployed and the total number of notified vacancies at a given point in time and to perform two different transformations of a variant of equation (6.3). Without loss of generality we can substitute V_{it} for V_{it}^* and A_t^* for $A_t c_{it}^*$. Imposing CRS on equation (6.3), the hiring rate, H/V, and the job finding rate, H/U, can then be easily derived:

$$\frac{H_{it}}{V_{it}} = F_i A_t^* e^{\varepsilon_{it}} [\frac{U_{it}}{V_{it}}]^{\delta_2} \tag{6.3'}$$

$$\frac{H_{it}}{U_{it}} = F_i A_t^* e^{\varepsilon_{it}} [\frac{V_{it}}{U_{it}}]^{\delta_1} \tag{6.3''}$$

If γ is the coefficient on the lagged dependent variable, the condition of CRS in a dynamic specification becomes $\delta_1+\delta_2 = 1-\gamma$, and estimable transformed versions of equation (6.6) are

$$\begin{aligned}\Delta(\ln H_{it} - \ln V_{it}) &= \Delta\ln A_t^* + \gamma\Delta(\ln H_{i,t-1} - \ln V_{it}) \\ &+ \delta_2 \Delta(\ln U_{it} - \ln V_{it}) + \Delta \varepsilon_{it}\end{aligned} \tag{6.6'}$$

$$\begin{aligned}\Delta(\ln H_{it} - \ln U_{it}) &= \Delta\ln A_t^* + \gamma\Delta(\ln H_{i,t-1} - \ln U_{it}) \\ &+ \delta_1 \Delta(\ln V_{it} - \ln U_{it}) + \Delta \varepsilon_{it}\end{aligned} \tag{6.6''}$$

Table 6.8 shows the estimates of these two equations. While all the diagnostic statistics are satisfactory, the null hypothesis of CRS is clearly rejected by the F-test. The results are thus discussed for heuristic purposes only.

Assuming for the moment the validity of CRS in the hiring function, the asymmetric situation in the Polish labour market is well demonstrated by the two regressions in Table 6.8. The U/V ratio is a highly significant positive predictor of the hiring rate (H/V), which, in our context, one can think of as an index of the ease with which a firm is able to fill a vacancy from the pool of the unemployed[26]. On the other hand, the V/U ratio is not correlated in a statistically significant way with the job finding rate (H/U), which one can think of as an unemployed worker's average probability of becoming employed. The first relationship implies that for the given number of vacancies (which is very small relative to the number of unemployed) an increase in the number of unemployed makes it easier for a firm to fill one vacancy from the pool of the unemployed. The second relationship says that for the given large number of unemployed an increase in the number of vacancies does not in any significant way increase an unemployed worker's chance of finding employment. This asymmetric experience of firms and unemployed workers is not very surprising if we look at the mean hiring and job finding rates implied by Table 6.2. Assuming that the mean levels of hirings and unemployment are accurately given and that the true mean level of vacancies registered with employment offices is reflected in the official figures, the estimated mean hiring rate is 1.767 and the estimated mean job finding rate is 0.023[27]. The extreme asymmetry in these numbers makes it, in our opinion, inappropriate to call the underlying process a matching process. As far as unemployed workers are concerned they have no bargaining power, hence the term hiring process seems more to the point.[28]

If we are to believe our estimates, different scenarios of this hiring process can be played out which might explain the predictive power of unemployment and the statistical insignificance of vacancies. One scenario could be skill mismatch. The stock of notified vacancies consists of job slots which are hard to fill from the existing pool of the unemployed and only an increase in the stock of the unemployed makes it possible to fill some of these slots. However, two things run against this scenario. First, in the unrestricted estimates of the hiring function for males and females and males jointly, the hiring process exhibits increasing returns to scale. Secondly, the vast majority of notified vacancies are in Polish statistical terminology "blue collar vacancies"[29] making it rather unlikely that we are considering vacancies firms cannot fill because of skill mismatch. Another scenario is that firms offer a small number of low productivity job slots to the unemployed at wages below or around the unemployed workers' reservation wages. At already very high levels of unemployment, further increases in unemployment can have a sobering effect on some of the unemployed, who might harbour misperceptions about their future job prospects, triggering a substantial enough fall in reservation wages to generate increasing returns in the hiring technology. The evidence which is available on the kind of vacancies registered with employment offices[30] could support this scenario.

Of course, the results we get when estimating (6.6) could also be driven by the fact that many of the vacancies for which unemployed persons are considered are not registered with employment offices. While the data on hiring and the registered unemployed might be relatively reliable, the data on notified vacancies might not reflect the true number of vacancies which Polish firms might like to fill from the pool of unemployed. So, there might exist a well functioning matching technology in the Polish labour market and the data at our disposal are just not able to pick up this stable relationship between the stocks of unemployment and vacancies and the flow of hirings.[31]

At any rate, the data analysis undertaken does produce <u>well specified</u> hiring functions which will be used to explore empirically the other two topics of interest mentioned at the beginning of this section.

Tables 6.5 to 6.7 are now revisited to examine whether the introduction of a new regime of benefit payments at the beginning of 1992 had an impact on the level of hirings which showed consecutive increases, at least for men, in February, March and April of 1992, a growth pattern which we do not observe in the same months of the previous year (cf. Table 6.A1). Because of a "fiscal squeeze" the government abolished the existing earnings-related benefit system (cf. appendix 1, ch.4) and introduced a uniform flat rate approximately equal to the minimum wage. This resulted in a sharp fall in the average replacement ratio (cf. OECD (1993), chapter 2) which might have caused a lowering of the reservation wage of some workers thus possibly enabling more hirings.

An ideal way to investigate whether this regime switch had an impact on hirings would consist of the inclusion of a benefit dummy (with values of 0 for 1991 and of 1 for 1992) into the set of regressors also containing time dummies. In this way the effect of the benefit regime switch could be netted out of the change in "augmented total factor productivity" of the hiring function. Since both benefit dummy and time dummies model aggregate determinants of the hiring function, the former is perfectly collinear with the latter and the matrix **z'x** is singular. Alternative specifications of the matrix of regressors which included a time trend or the aggregate U/V ratio and the benefit dummy but excluded time dummies produced, as seen, unsatisfactory diagnostic statistics. Thus the empirical implementation of the evaluation of the benefit regime switch must include time dummies and exclude the benefit dummy.

In Tables 6.5 - 6.7 the constant term gives the growth rate of "augmented total factor productivity" in the base month, May 1991, while the coefficients on the time dummies give the deviations from this base month growth rate. By adding the constant term to each time dummy coefficient we get an estimate of the absolute growth rate of "augmented total factor productivity" for each month of interest. The pattern of these growth rates over time is taken as evidence of the impact of the benefit regime switch on the level of hirings. In Figures 6.10 - 6.12 the estimated absolute monthly growth rates of "augmented total factor productivity" are plotted for the period May 1991 to December 1992. These data show a clear seasonal pattern.[32] However, for the first four months in 1992 the pattern is somewhat different. Especially in Figure 6.11 which gives the estimates for males, the period January 1992 - April 1992 displays four <u>consecutive</u> positive absolute growth rates (17.1%, 8.2%, 2.7% and 25.9%). Inspection of Table 6.6

shows that all these growth rates are highly significant. For women separately (Figure 6.12) and for men and women combined (Figure 6.10) this deviation in the pattern is not that strong, again pointing to different experiences for men and women in the Polish labour market.

In Poland the first four months of 1992 cannot be characterized as a time when economic activity picked up dramatically compared with the preceding months. Seasonally unadjusted aggregate data on e.g. industrial production, investment outlays and average employment in the six sectors of the national economy do not produce any sign of a substantive economic upturn in this period[33]. There are no data available on the duration structure of unemployment in 1991 and in the first half of 1992. Given the low monthly outflow rates from unemployment throughout 1992 (cf. Figure 6.4) it is highly unlikely that the duration structure of unemployment could in this period have changed drammatically towards a distribution with more mass in shorter duration categories, thus boosting the average search effectiveness of the unemployed. The only experience common to all voivodships at the beginning of 1992 which could have a positive impact on the level of hirings is the regime switch in benefit payments. Let us assume that the jobs offered to the unemployed are low productivity jobs which pay wages around their reservation wages. Then the regime switch which took place in Poland at the beginning of 1992 could have lowered the reservation wage of many unemployed and the four consecutive positive absolute growth rates of "augmented total factor productivity" could be taken as indirect evidence that introducing a flat rate of benefit payments had, at least for men, a significant positive impact on the level of hirings.[34]

The final issue to be tackled in this section is the evaluation of active labour market policies in 1992. As Figures 6.7 and 6.9 show the stocks of Community and

Public Works vacancies and the stocks of Retraining and Further Training participants increased drammatically in the last four months of 1992. We are interested in whether these changes had an impact on the level of hirings. As was previously discussed, training schemes have only an indirect impact on our measure of hirings via increased average search effectiveness of the stock of unemployed. This indirect impact can in our specific case only be picked up by the data if many of the Polish training measures are short-term, which we define as lasting up to one month. The available flow data on training measures allow us to estimate steady state mean durations of a training measure. For the last four months of 1992 the estimated mean duration was between 1 and 2 months for males and females alike[35]. Thus many training measures must be of a very short-term nature and evaluation of such measures within the present framework seems appropriate.

Tables 6.9 - 6.11 present estimates of equation (6.6) for the shorter sample T_2. Comparison of these results with the estimates of Tables 6.5 - 6.7 shows that the various hiring functions are "structurally stable" over the period 1991-1992. In all regressions with sample T_2 the coefficient on vacancies is close to 0 and insignificant, while in those regressions where the unemployment variable has predictive power the steady state values of its coefficient are very similar to those of the regressions with sample T_1. This can be taken as informal evidence of structural stability of the hiring functions[36].

The effect of ALMP on the level of hirings should be discussed seperately for men and women as even a superficial analysis of Tables 6.10 and 6.11 makes clear. In the regression for males with both ALMP measures included, the coefficient on the stock of training participants is positive and significant at the 5% level while the ratio V^{p}_{m}/V_{t} has no predictive power. When the latter measure is excluded the coefficient on the training measure rises by 13.5 per cent. The steady state value of the coefficient on the stock of male training participants (appr. 0.089) implies that, ceteris paribus, an increase of this stock by 100 will raise the level of hirings by about 9 per cent. In the regression for women with all regressors included the coefficient on V^p_f / V_t is negative and significant at the 10% level. There is some (negative) correlation between this ratio and vacancies and the stock of training participants. However, the regression with only training as an ALMP measure included, though raising the estimate of the coefficient on training, did not produce significance at conventional levels. On the other hand, excluding the stock of female training participants from the regression resulted in a very well defined negative coefficient on V^p_f / V_t. The steady state value of this coefficient (-0.076) implies that, ceteris paribus, an increase in the ratio of "public vacancies" for women relative to the total of notified vacancies by one will lower the level of female hirings into genuine jobs by about 7.3 per cent.

The magnitudes of these results are not too striking if we consider the sharp increase in the number of training participants and in the V^p_t/V_t ratio in the last four months of 1992. What is very interesting is the fact that, although unemployed women have higher participation rates in training measures, this higher participation does not have an effect on hirings while training measures for men seem to boost hirings. The ineffectiveness of female training measures and the fact that, ceteris paribus, an increase in "public vacancies" lowers female hirings can be considered reasonable results if the most jobs on offer for unemployed women pay extremely low wages. So, as "public vacancies" are increased in a Voivodship, many unemployed women might revise their reservation wages upward and female hirings are decreased. Alternatively, some of the unemployed women whose probability of finding a genuine job <u>at any wage rate</u> is very low[37] might wait for a slot on the 'Intervention Works' or Public Works scheme. This can be a rational decision given that the probability of being taken on a scheme is only slightly lower than that of finding a genuine job[38] and given that remuneration on a scheme can be substantially higher than that in a genuine job. The same reasoning could apply to men whose average monthly job finding rate and whose monthly probability of being employed on a scheme are similar (3% and 2.36%, cf. Table 6.4). The fact that "public vacancies" do not impact negatively on male hirings might then have two alternative explanations. Either there is more social pressure on men to take up permanent jobs even at very low wage rates, or there exist some job offers for men at employment offices which pay a wage rate far above the minimum wage[39].

Training measures boost male hirings but have no effect on female hirings. One explanation of this result could be that training courses for men have a human capital enhancing element, increasing the average search effectiveness of male unemployment, which is lacking in the training courses for women. However, there is no evidence for this assertion. A better explanation could be that even if the average search effectiveness of unemployed women is raised by these training measures, virtually all jobs on offer for them are low productivity, minimum wage jobs unacceptable to most of them[40].

V Conclusions

The descriptive analysis of the available flow data shows that in 1992 Polish flows between the different states of the labour market were small compared to most OECD countries. It also indicates that the labour market experience was different for men and women, as shown by lower female outflow rates and job finding rates.

The econometric results do not establish a well behaved matching function, as vacancies have no predictive power in any of the regressions. This is explained by the asymmetry in the Polish labour market of very high levels of unemployment and negligible levels of vacancies. However, well specified hiring functions can be estimated. The results of these estimations confirm that men and women have different experiences in the labour market. The hirings of women seem be determined, apart from lagged hirings, by unobservable Voivodship-specific fixed effects and aggregate variables common to all Voivodships. The level of male hirings, on the other hand, is not only determined by these variables but also by the stock of male unemployment. The estimates of the coefficient on the unemployment variable indicate an increasing returns to scale hiring technology for men. At very high levels of unemployment, increasing returns to scale might imply that, as unemployment rises even further, many male unemployed revise their reservation wages downward, thus boosting hirings. There is also some evidence that the benefit regime switch at the beginning of 1992 and the introduction of training measures in the latter part of 1992 have raised male hirings. The only statistically significant impact on female hirings comes from the introduction of "public vacancies" and is negative. Some women revise their reservation wages upward, others wait to be taken on a government sponsored scheme which normally pays a higher wage than the genuine jobs on offer for unemployed women.

The different experience for men and women, as seen in the raw data and the estimation results, is driven by two things. There are a lot more jobs on offer for unemployed men than unemployed women, but also the distribution of reservation wages and wages for jobs on offer for unemployed men overlap considerably while for women these distributions hardly overlap at all.

Footnotes

1. We compute these overall outflows using the same stock-flow identity as in chapters 1, 2 and 4:

$$A_t \equiv I_t - \Delta U_{t+1} .$$

2. Hirings as a percentage fraction of outflows from unemployment in 1992 were as follows:

Month	Total	Female	Male
Jan	55	56	55
Feb	69	61	77
Mar	40	34	44
Apr	60	58	61
May	59	51	65
Jun	51	42	58
Jul	57	54	60
Aug	64	59	68
Sep	60	60	60
Oct	54	48	58
Nov	53	49	56
Dec	44	40	47

3. There is no hard evidence on the magnitude of these flows, but casual evidence suggests that these flows are not negligible.

4. If we denote outflows from unemployment during month t as A_t and the stock of unemployment at the beginning of month t as U_t, then the overall outflow rate is defined as

$$\frac{A_t}{U_t} .$$

5. If hirings during month t are denoted as H_t and the stock at the beginning of month t as U_t, then we define the job finding rate of the unemployed as

$$\frac{H_t}{U_t} .$$

6. These outflow and inflow rates can be found in OECD (1993), chapter2.

7. Only in the summer months (June, July and August) did we assume relative large inflows of school leavers into the pool of the unemployed. Furthermore, in November 1990 when many registered unemployed without prior work experience lost their benefit eligibility there might have been larger outflows than usual.

8. For a description of this system see Appendix 1 in chapter 4. Layard (1990a) believes that the replacement ratio was very high in Poland in 1990. However, at least during this year, for many workers non-wage income was still a substantial part of their income. Thus unemployment benefits of say 70% meant less than 70% of an employed worker's income in 1990.

9. A fund set up by the Mazowiecki government in 1989 to finance expenditures of passive and active labour market policies. A mandatory contribution from employers (until the end of 1992 2% of the wage bill, from the beginning of 1993 3% of the wage bill) and transfers from the central budget make up the bulk of the income of the Labour Fund. Transfers from the central budget were 70.2% of total income in 1990, 57.2% in 1991 and 68.2% in 1992. Employers' contributions amounted to 23.7% in 1990, 31.6% in 1991 and 26% in 1992. The given figures and the figures which follow are taken from Ministry of Labour and Social Policy (April 1991 and April 1993).

10. The first type of loan is comparable to the British Enterprise Allowance Scheme (cf. chapter 1) while the second type is a subsidy for additional workers. Most loans in 1990 (but also in 1991 and 1992) went to individuals to set up their own business and only very few additional work places were generated by these loans to firms. In Lehmann (1991) both types of loans are critically discussed, no serious evaluation of both measures has been, however, undertaken thus far.

11. It is important to note that there is no endogeneity problem with the ALMP measures. The government did not react to low hiring flows (they were low throughout 1991 and 1992) by boosting these measures. The Ministry of Finance finally released funds in August 1992, earmarked much earlier for ALMP.

12. For September to December 1992 we have the following estimates of steady state mean durations of Intervention and Public Works:

	Duration in months		
month	total	female	male
Sep	3.57	3.87	3.43
Oct	2.64	3.07	2.49
Nov	3.75	3.41	3.95
Dec	5.79	5.05	6.32

13. For September to December 1992 we have the following estimates of steady state mean durations of training measures:

	Duration in months		
month	total	female	male

Sep	1.07	1.08	1.06
Oct	1.34	1.32	1.36
Nov	2.21	2.12	2.35
Dec	1.97	1.83	2.22

14. For a description of these programmes, see the previous section.

15. Of course, we could get $\beta < 0$ if we had the very unlikely scenario that such measures trained people systematically and predominantly in skills not required by firms.

16. In Table 6.1 the duration structure of unemployment is given for May and December 1992, while Table 6.A2 shows this structure at the end of December 1992 for males and females at the Voivodship level. The unbiased estimate of the variance is given by

$$S^2 = \frac{\sum_k (x_k - \bar{x})^2}{k-1} \text{ ,} where\ k=t\ or\ k=i$$

and t= {May 92, Dec 92} and i=1,...,49. S^2 estimated across time ,i.e. S^2 of 24.5 and 45.2 (the two percentage proportions of long-term unemployment for males and females in May and December 1992) equals 214.245, while S^2 of those proportions estimated across Voivodships in December 1992 is only 67.742. One may note that even if we use $S^{2*}=S^2(k-1)/k$ as our measure of variation, S^{2*} estimated across time equals 107.125, but 66.359 when estimated across Voivodships.

17. One should note that in 1991 and for most of 1992 expenditures on training measures too minuscule to be evaluated with this methodology. When estimating a hiring function for the longer sample we, therefore, do not have the problem of an omitted variable which would bias the coefficients of some of the regressors.

18. According to officials in the Central Statistical Office (GUS) who deal with labour market data on a daily basis.

19. Outflows for the i-th Voivodship are calculated using the stock-flow identity

$$A_{i,t} \equiv I_{i,t} - \Delta U_{i,t+1} \ .$$

20. If ε_{it} was generated by a random walk, the test statistics for first and second order serial correlation would be both insignificant.

21. They are available from the author upon request.

22. Again, these results are not shown here but are available upon request.

23. DPD sets the first three observations aside as instruments, so that the shown period is May 91 - December 1992.

24. As hirings seem to depend on unemployment the lagged difference and the lagged level of unemployment were included in the set of instruments, thus generating a more efficient AH estimator.

25. Burda (1993b) who regresses the stocks of unemployment and vacancies on gross outflows from unemployment stresses that the coefficient on unemployment has an upward bias in a differenced equation. This upward bias exists in his differenced regression because there is positive correlation between ΔU_{it} and $\Delta\varepsilon_{it}$ since (in our notation) $U_{it}=U_{i,t-1}+I_{i,t-1}-A_{i,t-1}$ and $A_{i,t-1}$ contains $\varepsilon_{i,t-1}$. In our regressions, however, this bias is not present as our dependent variable is not derived via the stock-flow identity but given exogenously. It is also worth mentioning that this bias in differenced gross outflow regressions can easily be eliminated by instrumenting ΔU_{it} using a GMM or an AH estimator.

26. On should not speak of a probability as estimates of H/V can exceed 1.

27. These numbers imply that in the steady state the average duration of a notified vacancy is 0.56 months and the average duration of an unemployment spell ending in "genuine" employment is 43.47 months (!).

28. Burda (1993a) finds a well behaved matching function for the Czech Republic (but also for Czechoslovakia). Given the very different data underlying the experience in the Czech labour market cited above, our different findings for the Polish labour market are not that surprising.

29. In Polish "Oferty Pracy Robotnicze". On average in 1992 "blue collar vacancies" constituted 84% of all notified vacancies.

30. There is no good evidence on notified vacancies nationwide. We inquired, however, about vacancies with the employment office in Warsaw, where we would expect more and better paid job offers than in most districts in the country. In April 1993, the vast majority of offered jobs (around 80%) were paying the minimum wage and apart from two outliers all other jobs on offer paid below the average wage.

31. It is also possible that in future when using aggregate time series a well behaved matching function can be found in the Polish labour market and that when using regional panel data such a function cannot be established even with correctly measured data. Such a possibility is e.g. discussed by Börsch-Supan (1991) who demonstrates that a stable German Beveridge curve, well established with aggregate time series data, cannot be found with regional panel data.

32. One should note, however, that time dummies in DPD do not control for seasonality.

33. We need to look at seasonally unadjusted aggregates as the time dummies track, but do not control for seasonal variation. Seasonally unadjusted industrial production was in the first four months of 1992 on average 84.4% of average industrial production in 1990, while in the last four months of 1991 industrial production averaged 83.3% of the 1990 number (GUS (December, 1992), page 20). Average employment in the six sectors of the economy declined in the first 4 months of 1992 over the last 4 months of 1991 from 86.3% to 83.7% of the monthly mean value of 1990 (Ibidem, page 14). Investment outlays increased by only 4.7% in real terms in the period January - June 1992 over the same period in 1991 (Ibidem, Tables 29 (page 88) and 22 (page 80).

34. This evidence is somewhat weak since we cannot compare the pattern of January - April 1992 to the pattern of the same time interval for another year. Once the data become available for the first 4 months in 1993, the growth rate pattern of these latter months can be inspected. If it is substantially different from that of January - April 1992, then we would have stronger evidence for our assertion.

35. See footnote 13.

36. A formal test was also performed with the longer sample by augmenting the regressor matrix with 2 columns where we put zeroes for 1991 and the values of the vacancy and unemployment variables for the subsample 1992. The Wald statistic testing for the joint significance of these 2 columns turned out to be insignificant.

37. According to Table 6.3 an estimate of the average monthly job finding rate for women is 1.74%.

38. An estimate of the former probability is 1.22% (cf. Table 6.3).

39. Even though vacancies are no longer given by gender, casual evidence from the Warsaw employment office tells us that job offers exist explicitly for women (e.g. in retail) most of which have a wage rate close to the minimum wage. On the other hand there are some job offers for men with better remuneration. Clearly, data need to be collected on the distribution of notified vacancies (by job content, skill, payment level etc.) before one can go beyond conjecture.

40. While there is no representative information on the payment structure of vacancies, firm evidence on the structure of reservation wages exists. The following table, based on the November 1992 Polish Labour Force Survey, demonstrates that most women have reservation wages above the minimum wage.

Distribution of Reservation Wages in Per Cent
November 1992

Reservation Wage Band (in million of Złoty)	Men	Women
< 1.0	0.8	1.3
1.0 - 1.5	28.1	45.1
1.5 - 2.0	37.2	39.3
2.0 - 2.5	15.3	8.1
2.5 - 3.0	12.9	4.4
> 3.0	5.7	1.8

Minimum Wage in November 1992: appr. 1,150,000 Złoty.
Source: GUS (February 1993)

Data Appendix

Data Sources:

For 1991, all Voivodship-level data used in the regressions were taken from the data base of the Polish labour market developed by Jan Rutkowski and Hartmut Lehmann at the Centre for Economic Performance, London School of Economics.

For 1992, the following unpublished tables provided by GUS were exploited:

Table 6: Stocks of unemployment*, inflows into unemployment and hirings from unemployment at Voivodship level;

Table 12: Stocks of vacancies at Voivodship level;

Table 15: Further Training and Retraining participants at Voivodship level;

Table 17: Intervention Works and Public Works participants at Voivodship level;

Table 33: Registered Unemployment according to duration at Voivodship level**.

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* All stocks are end-of-month data.

** Table 33 is for the reported period of 1992 only available in December, while all other mentioned tables are given monthly.

Table 6.1
The distribution (in per cent) of incomplete unemployment spells (s) in Poland

May 1992:*

Total stock	duration in months				
	$0<s\leq1$	$1<s\leq3$	$3<s\leq6$	$6<s\leq12$	$s>12$
Male & Female 2228000	7.5	12.6	19.5	35.9	24.5
Male 1112000	8.8	12.7	20.1	33.9	24.5
Female 1116000	6.3	12.4	18.9	37.9	24.5

* Estimates from Polish LFS.
Source: GUS (October 1992).

December 1992:*

Total stock	duration in months					
	$0<s\leq1$	$1<s\leq3$	$3<s\leq6$	$6<s\leq9$	$9<s\leq12$	$s>12$
Male & Female 2509342	4.7	12.5	15.7	11.9	10	45.2
Male 1170533	6	14.4	15.9	12.4	10.6	40.6
Female 1338809	3.6	10.8	15.4	11.5	9.5	49.2

* Actual numbers from Polish Live Register.
Source: Unpublished register data provided by GUS.

Table 6.2
Monthly Summary Statistics on Voivodship Level
Males and Females - January-December 1992

Variable	Mean	Std Dev	Minimum	Maximum
Hirings	1114.7	650.0	167	3954
Outflows*	2079.8	1803.6	162	15557
Unemployment	47746.5	21716.5	11556	150641
Vacancies	630.6	1001.5	4	6615
Training	185.1	385.1	0	4351
Interv. Works	685.6	523.1	16	2985
Pub.Works	170.5	294.6	0	1953

* 5 negative values were deleted out of 588 observations.

Table 6.3
Monthly Summary Statistics on Voivodship Level
Females - January-December 1992

Variable	Mean	Std Dev	Minimum	Maximum
Hirings	441.5	307.1	55	2037
Outflows*	919.2	887.0	6	6829
Unemployment	25356.9	13349.7	6669	102134
Training	105.9	236.4	0	2396
Interv. Works	299.2	242.3	10	1462
Pub.Works	9.6	24.6	0	411

* 12 negative values were deleted out of 588 observations.

Table 6.4
Monthly Summary Statistics on Voivodship Level
Males - January-December 1992

Variable	Mean	Std Dev	Minimum	Maximum
Hirings	673.2	370.7	85	1976
Outflows*	1175.6	968.0	109	8728
Unemployment	22389.6	9141.9	4828	55676
Training	79.2	160.3	0	2039
Interv. Works	386.5	305.5	1	1648
Pub.Works	160.9	278.5	0	1854

* 5 negative values were deleted out of 588 observations.

Table 6.5 Panel data estimate of hiring function Poland 1991 - 1992 (males and females)

FIRST DIFFERENCES IV

Number of Voivodships: 49 Sample period:May 91 - Dec 92
Observations: 980 Degrees of freedom: 957

Dependent variable is:ln H_t

Instruments used are (Anderson-Hsiao Estimator):
CONST dht(-2) ht(-2) dut dut(-1) ut(-1) dvt
time dummies

ONE-STEP ESTIMATES WITH ROBUST TEST STATISTICS

Wald test of joint significance:	66.077358	df =	3
Wald test - jt sig of time dums:	713.099253	df =	20

VARIABLES	COEFFICIENTS	Std. Error	T-Stat	P-Value
constant	-0.149619	0.046323	-3.229925	0.001238
ln H_t(-1)	0.569237	0.075933	7.496540	0.000000
ln U_t	0.769462	0.425260	1.809390	0.070390
ln V_t	-0.007247	0.037186	-0.194874	0.845491
TIME DUMMIES				
6/91	0.151028	0.068688	2.198763	0.027895
7/91	-0.014268	0.053256	-0.267921	0.788760
8/91	0.152486	0.063125	2.415631	0.015708
9/91	0.474111	0.059778	7.931209	0.000000
10/91	-0.023969	0.054892	-0.436666	0.662353
11/91	-0.179665	0.065555	-2.740675	0.006131
12/91	0.030279	0.056028	0.540429	0.588901
1/92	0.347023	0.104813	3.310887	0.000930
2/92	0.200652	0.064075	3.131516	0.001739
3/15	0.147504	0.068432	2.155491	0.031123
4/92	0.358860	0.056287	6.375570	0.000000
5/92	-0.029028	0.064907	-0.447221	0.654715
6/92	0.112280	0.063955	1.755600	0.079157
7/92	0.015826	0.057485	0.275309	0.783079
8/92	0.146178	0.050508	2.894148	0.003802
9/92	0.547231	0.054442	10.051694	0.000000
10/92	0.178833	0.054428	3.285667	0.001017
11/92	-0.236585	0.046379	-5.101146	0.000000
12/92	-0.083621	0.072166	-1.158730	0.246566

TWO-STEP ESTIMATES

Wald test of joint significance:	80.624662	df =	3
Wald test - jt sig of time dums:	777.989056	df =	20
Sargan test:	3.010905 (probvalue=0.390)	df =	3

Robust test for first-order serial correlation: -4.499
Robust test for second-order serial correlation: 0.210

Table 6.6 Panel data estimate of hiring function
Poland 1991 - 1992 (males)

FIRST DIFFERENCES IV

Number of Voivodships: 49 Sample period: May 91 - Dec 92
Observations: 980 Degrees of freedom: 955

Dependent variable is: ln H_m

Instruments used are (Anderson-Hsiao Estimator):
CONST dhm(-2) hm(-2) dum dum(-1) um(-1) dvt
time dummies

ONE-STEP ESTIMATES WITH ROBUST TEST STATISTICS

VARIABLES	COEFFCIENTS	Std. Error	T-Stat	P-Value
constant	-0.175519	0.048871	-3.591437	0.000329
ln H_m(-1)	0.539130	0.060547	8.904345	0.000000
ln U_m	1.076382	0.369801	2.910707	0.003606
ln V_t	-0.005816	0.036004	-0.161535	0.871672
TIME DUMMIES				
6/91	0.155045	0.076501	2.026696	0.042694
7/91	-0.020344	0.059791	-0.340249	0.733669
8/91	0.159702	0.067865	2.353217	0.018612
9/91	0.394038	0.064347	6.123661	0.000000
10/91	0.128520	0.052242	2.460090	0.013890
11/91	-0.226723	0.078728	-2.879842	0.003979
12/91	0.032760	0.060290	0.543373	0.586873
1/92	0.346754	0.105364	3.291016	0.000998
2/92	0.257197	0.068067	3.778603	0.000158
3/92	0.202642	0.077801	2.604612	0.009198
4/92	0.434381	0.057765	7.519749	0.000000
5/92	-0.020670	0.069995	-0.295304	0.767762
6/92	0.095979	0.064657	1.484423	0.137697
7/92	0.059105	0.058579	1.008986	0.312981
8/92	0.144076	0.052828	2.727287	0.006386
9/92	0.460071	0.062070	7.412159	0.000000
10/92	0.427348	0.062270	6.862785	0.000000
11/92	-0.376085	0.055252	-6.806696	0.000000
12/92	-0.076145	0.072023	-1.057228	0.290408

TWO-STEP ESTIMATES

Wald test of joint significance:	98.287281	df =	3
Wald test - jt sig of time dums:	740.592940	df =	20
Sargan test:	1.833730	df =	3
	(probvalue=0.607)		

Robust test for first-order serial correlation: -4.694
Robust test for second-order serial correlation: -0.308

Table 6.7 Panel data estimate of hiring function Poland 1991 -1992 (females)

FIRST DIFFERENCES IV

Number of Voivodships: 49 Sample period: May 91 - Dec 92
Observations: 980 Degrees of freedom: 957

Dependent variable is: ln H_f

Instruments used are (Anderson-Hsiao estimator):
CONST dhf(-2) hf(-2) duf duf(-1) uf(-1) dvt
time dummies

ONE-STEP ESTIMATES WITH ROBUST TEST STATISTICS

VARIABLES	COEFFICIENTS	Std. Error	T-Stat	P-Value
constant	-0.099562	0.051525	-1.932311	0.053321
ln $H_f(-1)$	0.472272	0.084648	5.579213	0.000000
ln U_f	0.375574	0.538152	0.697895	0.485243
ln V_t	0.013032	0.043103	0.302335	0.762397
TIME DUMMIES				
6/91	0.135663	0.079642	1.703415	0.088490
7/91	-0.008252	0.057871	-0.142593	0.886612
8/91	0.100116	0.071313	1.403882	0.160354
9/91	0.591140	0.068696	8.605140	0.000000
10/91	-0.200054	0.072996	-2.740622	0.006132
11/91	-0.105534	0.060785	-1.736190	0.082530
12/91	-0.020646	0.060915	-0.338938	0.734657
1/92	0.302885	0.105097	2.881952	0.003952
2/92	0.115192	0.073986	1.556948	0.119483
3/92	0.059051	0.062307	0.947747	0.343258
4/92	0.219663	0.080677	2.722737	0.006474
5/92	-0.016985	0.066600	-0.255028	0.798702
6/92	0.131462	0.071067	1.849816	0.064340
7/92	-0.049823	0.069388	-0.718029	0.472739
8/92	0.112100	0.056408	1.987294	0.046890
9/92	0.661221	0.073232	9.029136	0.000000
10/92	-0.150783	0.067360	-2.238478	0.025190
11/92	0.034262	0.065645	0.521930	0.601719
12/92	-0.161289	0.077978	-2.068403	0.038602

TWO STEP ESTIMATES
Sargan test: 5.174002 df = 3
(probvalue=0.159)

Robust test for first-order serial correlation: -4.916
Robust test for second-order serial correlation: 1.634

Table 6.8 Panel data estimates of hiring and job finding rate: CRS imposed on hiring function Poland 1991-1992 (males and females)

Number of Voivodships: 49 Sample period: May 91 - December 92
Observations: 980 Degrees of freedom: 958

1. Dependent variable is: ln $(H/V)_t$; First differences and IV

Instruments used are:
CONST dhvt(-2) hvt(-2) duvt dut(-1) ut(-1) time dummies

Restricted RSS = 102.061 Unrestricted RSS = 99.409
F-Test: H_0: $\delta_1 + \delta_2 = 1 - \gamma$; F(1,955) = 25.5 .

ONE-STEP ESTIMATES WITH ROBUST TEST STATISTICS

VARIABLES	COEFFICIENTS	Std. Error	T-Stat	P-Value
constant	-0.136956	0.038395	-3.567044	0.000361
ln $(H/V)_{t,-1}$	0.561577	0.072616	7.733571	0.000000
ln $(U/V)_t$	0.449607	0.066367	6.774541	0.000000

TWO-STEP ESTIMATES

Sargan test: 3.033711 df = 3
Robust test for first-order serial correlation: -4.633
Robust test for second-order serial correlation: 0.130

2. Dependent variable is: ln $(H/U)_t$; First differences and IV

Instruments used are:
CONST dhut(-2) hut(-2) dvut dut(-1) ut(-1) time dummies

ONE-STEP ESTIMATES WITH ROBUST TEST STATISTICS

VARIABLES	COEFFICIENTS	Std. Error	T-Stat	P-Value
constant	-0.136956	0.038395	-3.567044	0.000361
ln $(H/U)_{t,-1}$	0.561577	0.072616	7.733571	0.000000
ln $(V/U)_t$	-0.011184	0.039219	-0.285166	0.775517

TWO-STEP ESTIMATES

Sargan test: 3.033711 df = 3
Robust test for first-order serial correlation: -4.633
Robust test for second-order serial correlation: 0.130

Time dummies were included into the regressions.

Table 6.9 - Panel estimates of hiring functions
Poland: April - December 1992 (females and males)
-Estimation in first differences and IV-

Dependent Variable: ln H_t
Observational units: 49 Voivodships; Observations: 441

ESTIMATES[+]

Regressors	Coefficients			
const	0.225**	0.225**	0.222**	0.222**
	(0.046)	(0.047)	(0.046)	(0.046)
ln $H_t(-1)$	0.590**	0.588**	0.556**	0.540**
	(0.076)	(0.079)	(0.071)	(0.085)
ln U_t	0.795**	0.883**	0.839**	0.967**
	(0.397)	(0.398)	(0.413)	(0.418)
ln V_t	-0.040	-0.039	0.001	0.016
	(0.055)	(0.055)	(0.041)	(0.039)
$(V^P)_t/V_t$	-0.009	-0.011*	--	--
	(0.006)	(0.006)		
$TM_t/100$	0.010	--	0.013*	--
	(0.007)		(0.007)	
DIAGNOSTICS[++]				
Sargan Test	$Chi^2(27)$=22.09 (probval=0.733)	$Chi^2(27)$=23.52 (probval=0.657)	$Chi^2(27)$=24.04 (probval=0.628)	$Chi^2(27)$=23.02 (probval=0.578)
1st order ser. corr.	AN_1 = -4.764	AN_1 = -5.001	AN_1 = -4.867	AN_1 = -4.875
2nd order ser. corr.	AN_2 = -0.946	AN_2 = -0.919	AN_2 = -1.004	AN_2 = -1.166

Standard Errors in brackets. AN=Asymptotically Normal. ** (*) = significant at 5% (10%) significance level. [+]Estimates are robust to heteroscedasticity. [++]Diagnostic statistics are two-step estimates.
Instruments used are ln $H_t(-2)$, ln $H_t(-3)$, ln $H_t(-4)$, ln $U_t(-1)$, Δln $U_t(-1)$. Time dummies included in the regression.

Table 6.10 - Panel estimates of hiring functions
Poland: April - December 1992 (males)
-Estimation in first differences and IV-

Dependent Variable: $\ln H_m$
Observational units: 49 Voivodships; Observations: 441

ESTIMATES[+]

Regressors	Coefficients		
const	0.277**	0.276**	0.276**
	(0.049)	(0.049)	(0.049)
$\ln H_m(-1)$	0.555**	0.533**	0.516**
	(0.069)	(0.069)	(0.071)
$\ln U_m$	1.067**	1.091**	1.195**
	(0.339)	(0.345)	(0.353)
$\ln V_t$	-0.042	-0.014	0.001
	(0.053)	(0.042)	(0.040)
$(V^P)_m/V_t$	-0.010	--	--
	(0.007)		
$TM_m/100$	0.037**	0.042**	--
	(0.017)	(0.017)	
DIAGNOSTICS[++]			
Sargan Test	$Chi^2(27)=26.50$ (probval=0.491)	$Chi^2(27)=27.25$ (probval=0.450)	$Chi^2(27)=27.97$ (probval=0.413)
1st order ser. corr.	$AN_1 = -5.388$	$AN_1 = -5.299$	$AN_1 = -5.306$
2nd order ser. corr.	$AN_2 = -0.689$	$AN_2 = -0.913$	$AN_2 = -1.013$

Standard Errors in brackets. AN=Asymptotically Normal. ** (*) = significant at 5% (10%) significance level. [+]Estimates are robust to heteroscedasticity. [++]Diagnostic statistics are two-step estimates.
Instruments used are $\ln H_m(-2)$, $\ln H_m(-3)$, $\ln H_m(-4)$, $\ln U_m(-1)$ and $\Delta \ln U_m(-1)$. Time dummies included in the regression.

Table 6.11 - Panel estimates of hiring functions
Poland: April - December 1992 (females)
-Estimation in first differences and IV-

Dependent Variable: ln H_f
Observational units: 49 Voivodships; Observations: 441

ESTIMATES[+]

Regressors	Coefficients			
const	0.127**	0.129**	0.122**	0.122**
	(0.055)	(0.055)	(0.053)	(0.053)
ln $H_f(-1)$	0.448**	0.460**	0.420**	0.416**
	(0.079)	(0.080)	(0.071)	(0.085)
ln U_f	0.457	0.543	0.591	0.718
	(0.602)	(0.599)	(0.625)	(0.623)
ln V_t	-0.004	-0.008	0.052	0.060
	(0.070)	(0.071)	(0.056)	(0.053)
$(V^P)_f/V_t$	-0.037*	-0.041**	--	--
	(0.020)	(0.019)		
$TM_f/100$	0.003	--	0.012	--
	(0.011)		(0.011)	
DIAGNOSTICS[++]				
Sargan Test	$Chi^2(27)$=26.04 (probval=0.516)	$Chi^2(27)$=24.63 (probval=0.595)	$Chi^2(27)$=26.03 (probval=0.517)	$Chi^2(27)$=24.94 (probval=0.578)
1st order ser. correlation	AN_1 = -4.280	AN_1 = -4.467	AN_1 = -4.224	AN_1 = -4.505
2nd order ser. correlation	AN_2 = 0.211	AN_2 = 0.332	AN_2 = 0.288	AN_2 = 0.408

Standard Errors in brackets. AN=Asymptotically Normal. ** (*) = significant at 5% (10%) significance level. [+]Estimates are robust to heteroscedasticity. [++]Diagnostic statistics are two-step estimates.
Instruments used are ln $H_f(-2)$, ln $H_f(-3)$, ln $H_f(-4)$, ln $U_f(-1)$ and Δln $U_f(-1)$. Time dummies included in the regression.

Table 6.A1 Basic stock and flow data of the Polish Labour Market
January 1991 - December 1992

Month	Unemployment stocks			vacancies	Inflows			Hirings		
	total	female	male		total	female	male	total	female	male
Jan 91	1195656	611337	584319	45349				35101	15292	19809
Feb 91	1258928	644508	614412	42222				32511	14942	17569
Mar 91	1322105	679025	643080	45794				35383	15778	19605
Apr 91	1370128	707869	662251	49917				39175	15777	23398
May 91	1434508	742902	691606	47031				38236	15499	22737
Jun 91	1574099	819722	754377	47367				38465	15477	22988
Jul 91	1749867	911995	837872	48900				37636	15329	22307
Aug 91	1853959	972243	881716	51371				37667	15280	22387
Sep 91	1970854	1033698	937156	48037				53607	24095	29512
Oct 91	2040427	1077542	962885	40206				61007	25217	35790
Nov 91	2108294	1113568	994726	35349				49864	21180	28684
Dec 91	2155573	1134124	1021449	29101				42259	18746	23513
Jan 92	2211753	1160752	1051001	29869	132281	59986	72295	41883	18561	23322
Feb 92	2245643	1174244	1071399	24892	102016	46624	55392	47202	20196	27006
Mar 92	2216370	1161521	1054849	26831	96394	45645	50749	49975	20059	29916
Apr 92	2218422	1165906	1052516	27651	101884	41112	60772	59763	21142	38621
May 92	2228632	1171566	1057066	31517	106565	45008	61557	57323	20065	37258
Jun 92	2296733	1220424	1076309	31690	171260	94514	76746	52497	19088	33409
Jul 92	2409109	1286251	1122858	36164	192363	97527	94836	45928	17181	28747
Aug 92	2457052	1314301	1142751	36981	117116	56700	60416	44362	16913	27449
Sep 92	2498481	1341919	1156562	40475	147363	75416	71947	63428	28514	34914
Oct 92	2477326	1341195	1136131	34202	128639	59336	69303	80553	28728	51825
Nov 92	2490067	1341312	1148755	29367	136061	56640	79421	65332	27802	37530
Dec 92	2509342	1338809	1170533	22926	127708	50562	77146	47198	21326	25872

Source: Unpublished data provided by GUS.
Note: Stocks are measured at the end of given month.

Table 6.A2 Registered unemployed according to length of continuous unemployment spell by voivodship in per cent for december 1992: Males and Females

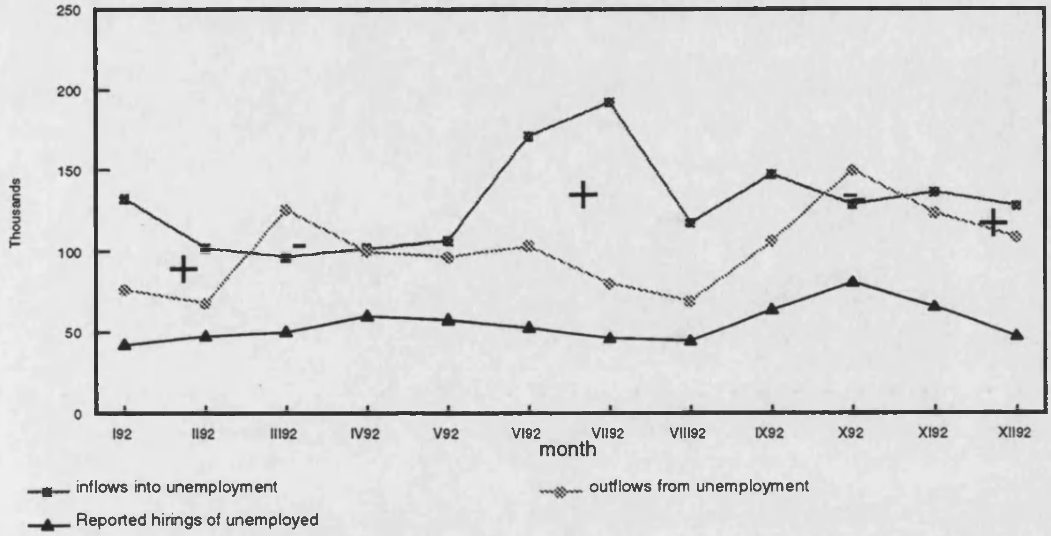
	continuous unemployment spell (s) in months					
	0 < s <=1	1 < s <=3	3 < s <=6	6 < s <=9	9 <s<=12	s > 12
Whole Country	4.7	12.5	15.7	11.9	10.0	45.2
Warszawa	6.5	15.3	19.6	12.9	12.2	33.5
Biała Podlaska	5.2	15.5	18.4	8.5	6.4	46.0
Białystock	4.4	11.9	16.8	13.8	7.3	45.8
Bielsko-Biała	6.1	21.8	21.5	14.7	11.1	24.9
Bydgość	4.3	11.4	15.9	13.6	13.3	41.5
Chełm	7.7	16.2	18.4	15.6	9.6	32.6
Ciechanów	3.4	6.6	10.8	11.7	6.5	60.9
Częstochowa	4.8	10.5	12.0	8.4	9.9	54.5
Elbląg	3.6	8.7	14.1	13.8	9.9	49.9
Gdańsk	6.3	12.5	18.9	13.0	11.2	38.1
Gorzów	4.6	15.2	16.3	11.2	9.6	43.0
Jeleniogóra	4.9	12.1	16.8	12.1	10.5	43.6
Kalisz	4.2	9.5	13.5	11.9	7.9	53.1
Katowice	4.5	17.8	17.9	9.3	8.4	42.1
Kielce	4.2	14.5	16.8	8.8	8.8	46.8
Koniń	2.9	15.7	15.9	11.4	9.8	44.3
Koszalin	4.1	14.4	13.4	8.2	5.5	54.3
Kraków	5.9	17.2	16.7	10.7	11.2	38.3
Krośno	5.2	8.4	14.3	11.3	6.8	54.0
Legnica	4.8	10.0	15.3	13.1	10.1	46.6
Leszno	6.9	13.1	16.1	11.6	7.7	44.7
Lublin	4.1	15.5	19.0	11.8	9.5	40.1
Łomża	3.2	9.8	14.0	10.0	9.3	53.6
Łódź	5.3	13.7	16.8	18.0	19.1	27.1
Nowy Sącz	3.8	9.4	13.2	13.7	7.2	52.6
Olsztyń	2.9	13.5	14.2	9.9	9.3	50.3
Opole	6.1	11.7	16.2	16.4	13.9	35.6
Ostrołęka	5.7	9.2	14.4	11.8	7.8	51.2
Piła	4.2	10.3	15.1	10.7	7.7	52.0

Table 6.A2 (cont.) Registered unemployed according to length of continuous unemployment spell by voivodship in per cent for december 1992: Males and Females

	continuous unemployment spell (s) in months					
	0 < s <=1	1 < s <=3	3 < s <=6	6 < s <=9	9 <s<=12	s > 12
Piotrków	2.9	8.3	12.5	10.6	8.6	57.0
Płock	3.9	12.6	14.6	13.6	11.7	43.7
Poznań	7.5	20.4	18.9	11.1	10.7	31.3
Przemyśl	3.6	8.7	13.1	14.0	9.9	50.7
Radom	4.0	14.4	20.0	11.7	9.2	40.7
Rzeszów	5.5	9.9	13.3	8.0	6.4	56.9
Siedlce	4.0	8.0	11.6	10.1	7.5	58.8
Sieradz	4.3	9.4	13.9	13.8	8.9	49.7
Skierniewice	5.0	10.3	17.0	14.4	13.0	40.4
Słupsk	4.6	11.4	14.8	11.7	10.5	47.1
Suwałki	4.4	9.6	12.4	11.2	10.0	52.4
Szczecin	5.4	12.4	17.8	12.3	9.8	42.3
Tarnobrzeg	3.1	7.9	12.3	11.6	7.2	57.9
Tarnów	4.5	13.5	18.4	7.5	5.2	50.8
Toruń	5.7	12.1	14.0	12.0	10.7	45.5
Wałbrzych	4.0	10.7	13.2	16.1	17.8	38.1
Włocławek	5.9	12.1	16.1	10.9	12.1	42.9
Wrocław	6.4	14.2	16.8	12.2	9.7	40.8
Zamość	3.3	7.2	13.0	13.7	8.3	54.5
Zielona Góra	5.7	11.7	16.4	13.0	9.8	43.5

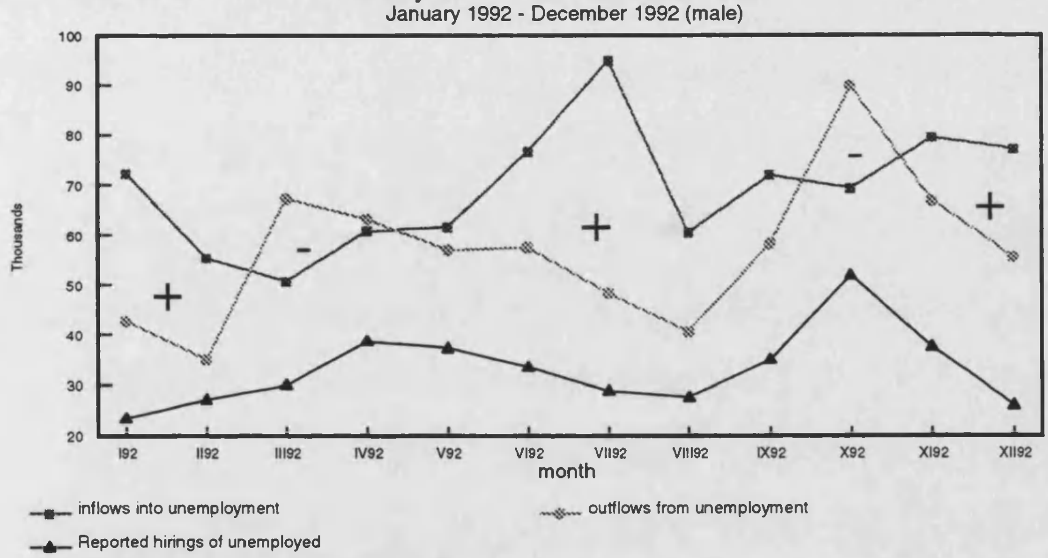
Source: Unpublished data provided by GUS.

Figure 6.1 Monthly flows in the Polish labour market
January 1992 - December 1992 (male and female)



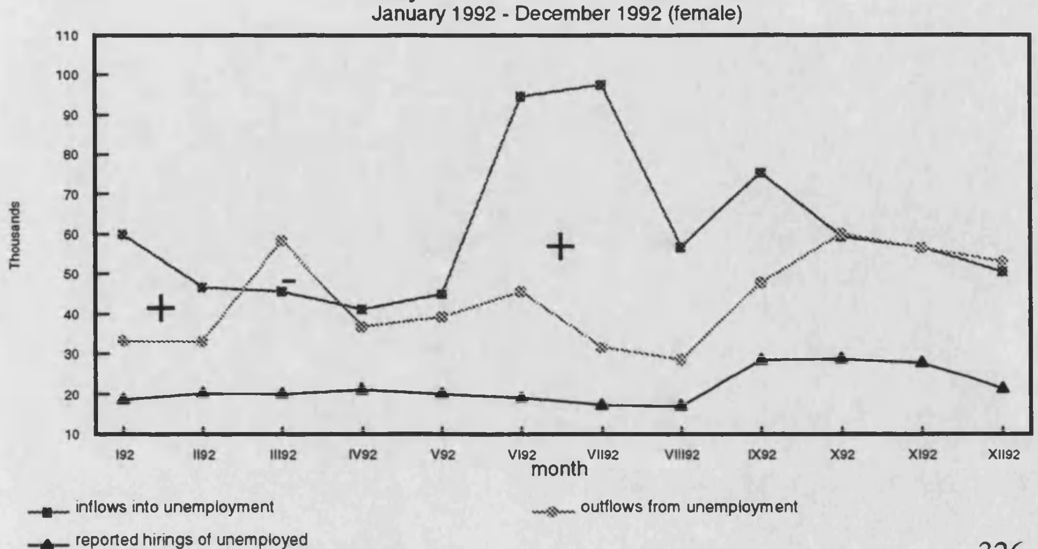
Source: own calculations based on unpublished data provided by GUS.

Figure 6.2 Monthly flows in the Polish labour market
January 1992 - December 1992 (male)



Source: own calculations based on unpublished data provided by GUS.

Figure 6.3 Monthly flows in the Polish labour market
January 1992 - December 1992 (female)

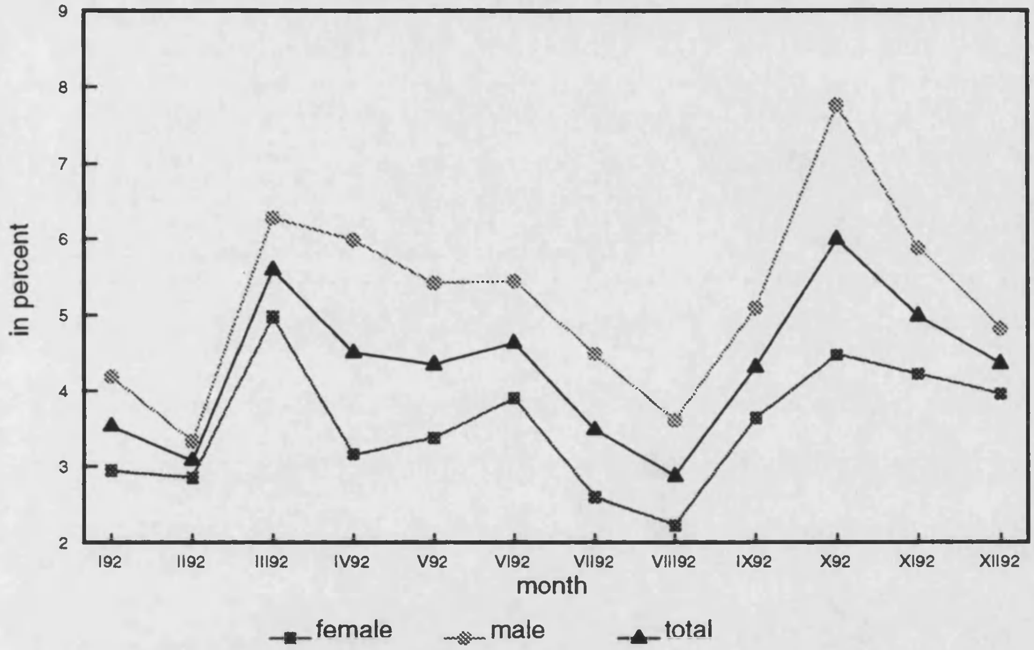


Source: own calculations based on unpublished data provided by GUS.

Figure 6.4

Monthly Outflow Rates from Unemployment - A/U

The Polish labour market: January 1992 - December 1992

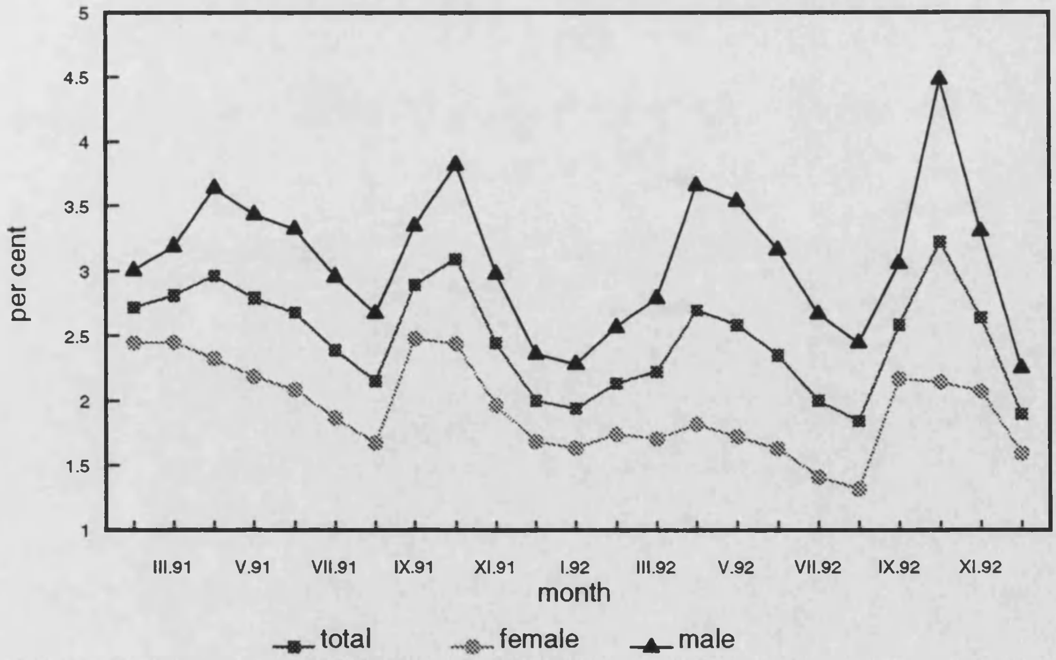


Source: own calculations based on unpublished data provided by GUS.

Figure 6.5

Job finding rates of the unemployed - H/U

The Polish labour market: February 1991 - December 1992

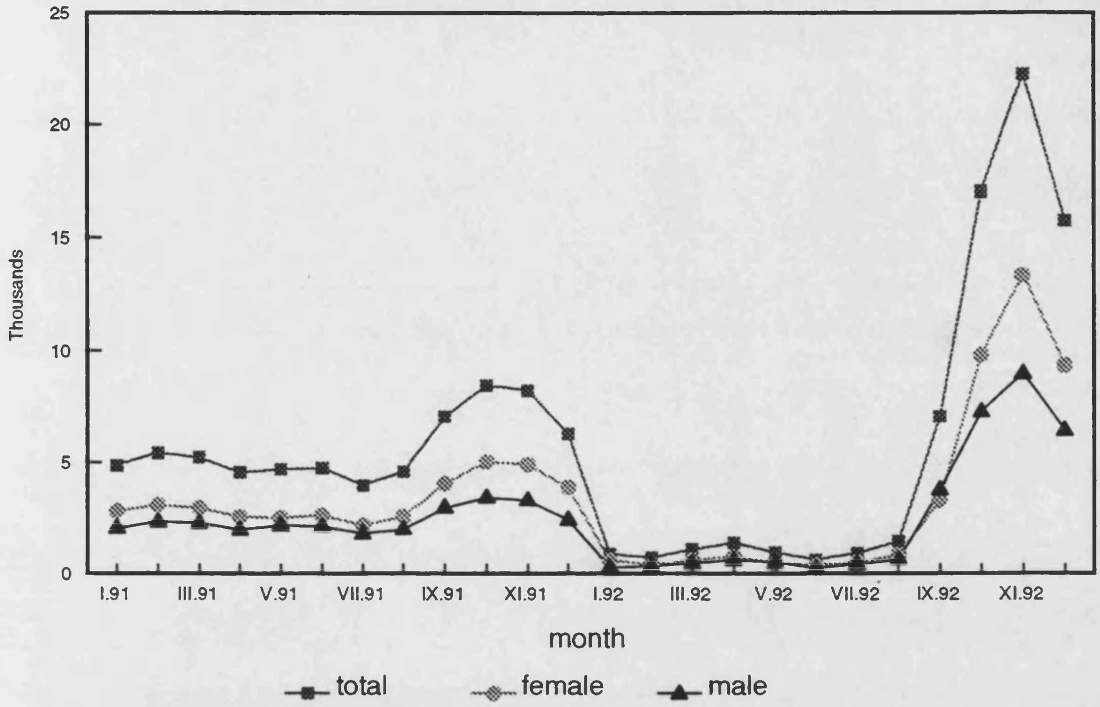


Source: own calculations based on unpublished data provided by GUS.

Figure 6.6

Inflows from unemployment into Intervention and Public Works

The Polish labour market: January 1991 - December 1992

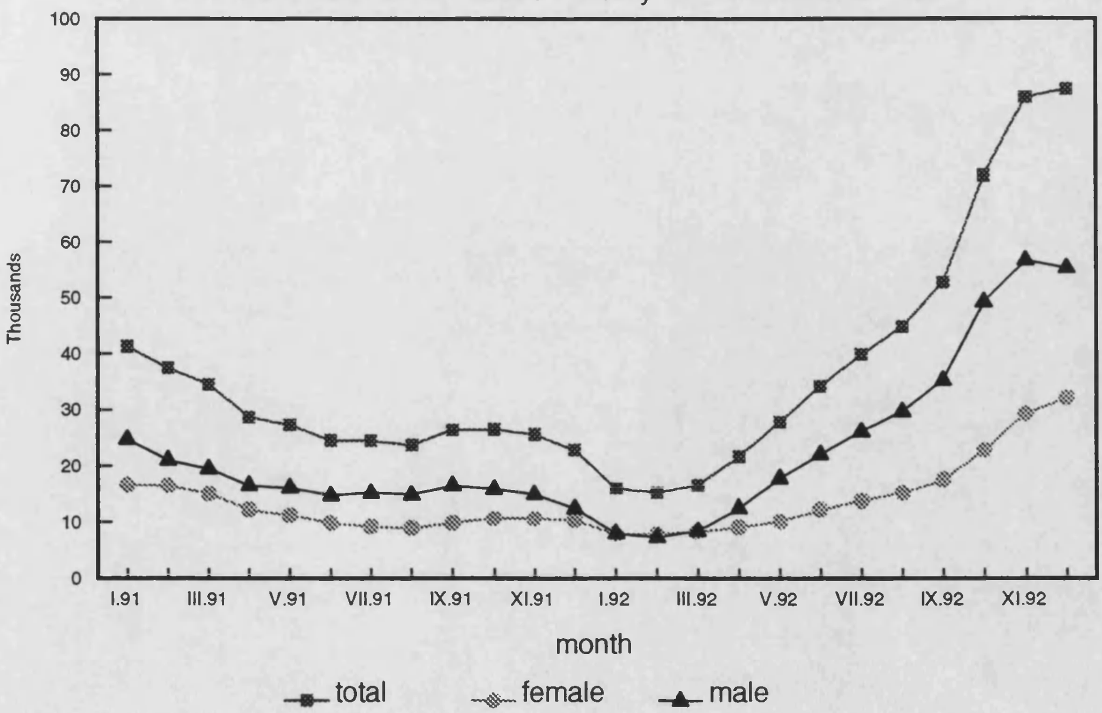


Source: own calculations based on unpublished data provided by GUS.

Figure 6.7

Stocks of Intervention and Public Works participants

The Polish labour market: January 1991 - December 1992



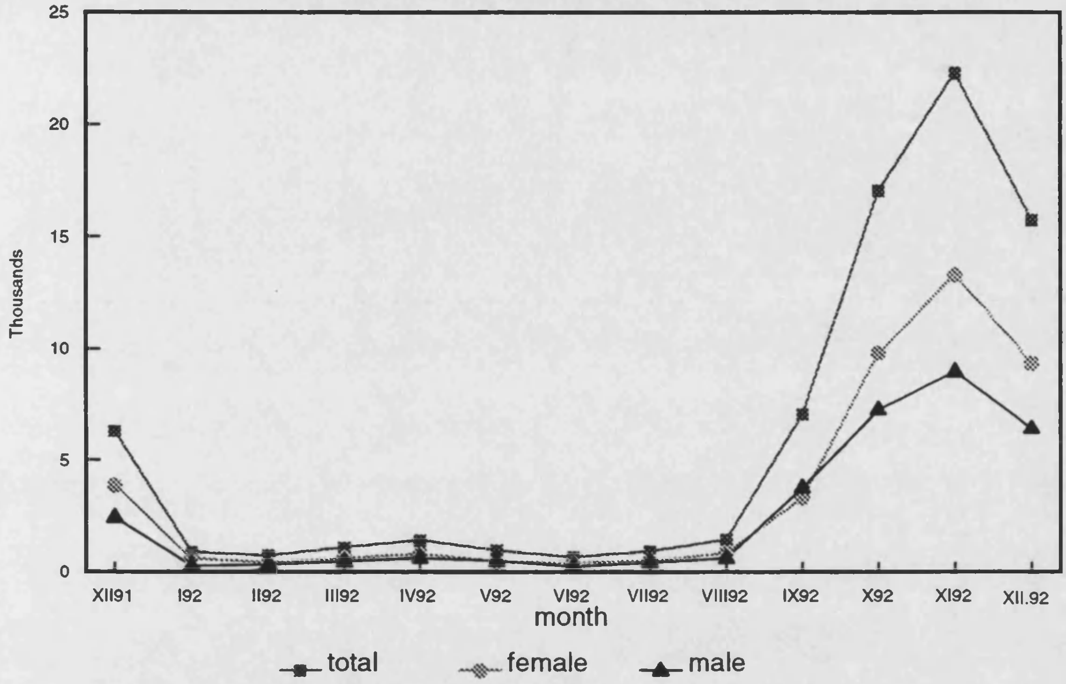
Source: own calculations based on unpublished data provided by GUS.

Note: the term Intervention Works is explained in the text.

Figure 6.8

Inflows from unemployment into Further Training and Retraining

The Polish labour market: December 1991 - December 1992

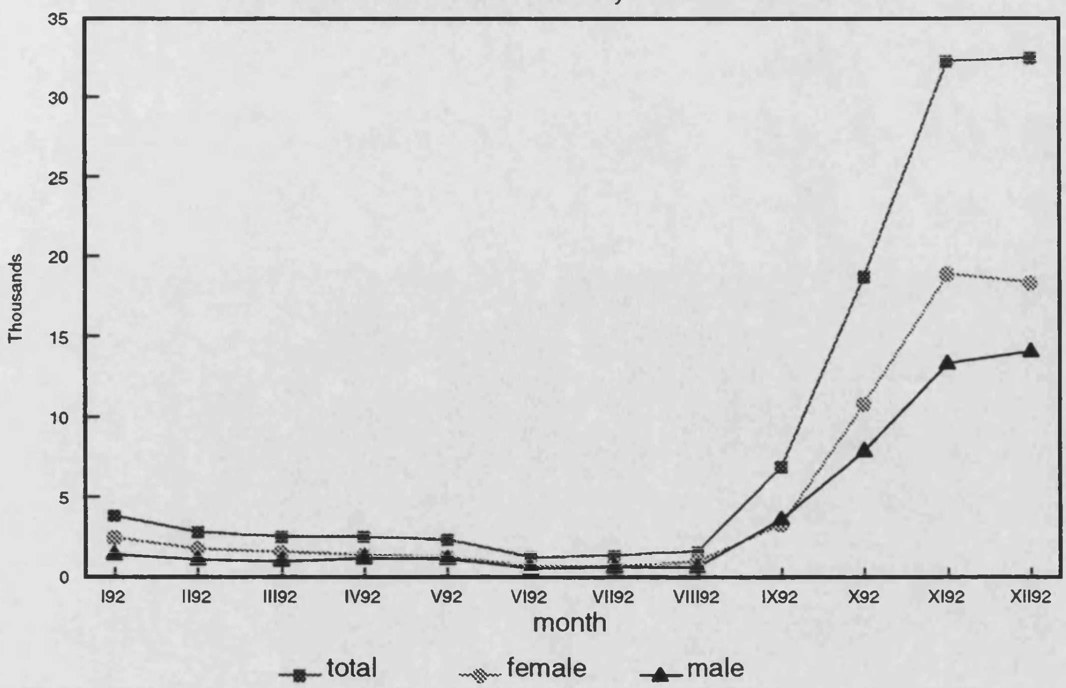


Source: own calculations based on unpublished data provided by GUS.

Figure 6.9

Stocks of Retraining and Further Training participants

The Polish labour market: January 1992 - December 1992



Source: own calculations based on unpublished data provided by GUS.

Figure 6.10 "Augmented total factor productivity" of Polish hiring function
Absolute monthly growth rates (males and females)

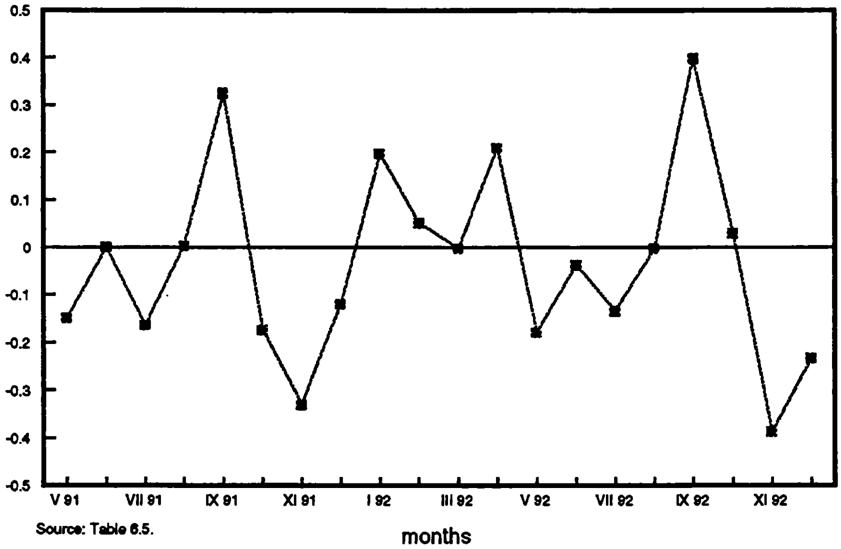


Figure 6.11 "Augmented total factor productivity" of Polish hiring function
Absolute monthly growth rates (males)

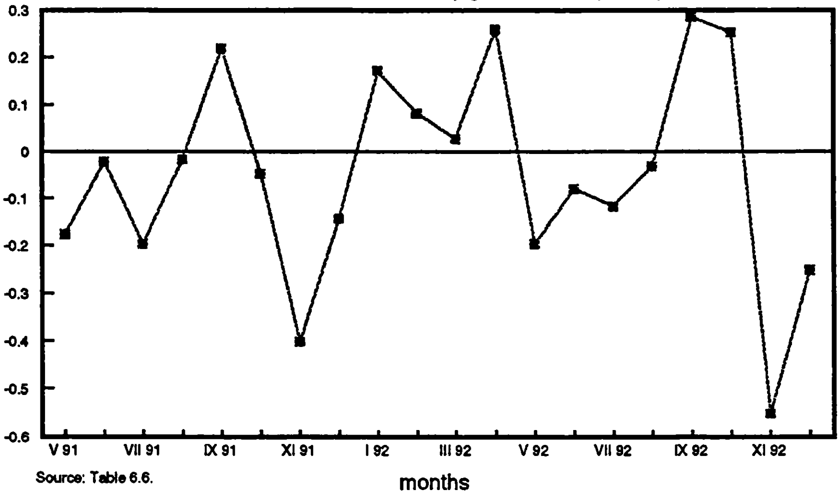
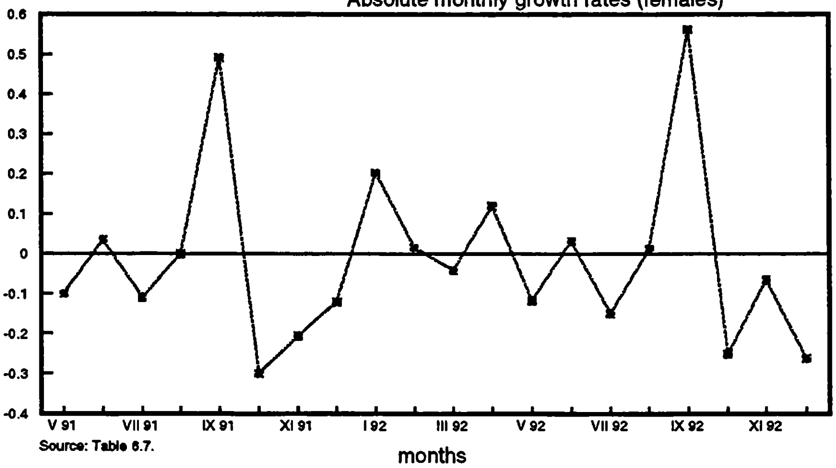


Figure 6.12 "Augmented total factor productivity" of Polish hiring function
Absolute monthly growth rates (females)



Conclusions

This study has utilized transition methodology to assess the effectiveness of labour market policies in Britain, Ireland and Poland. In the British case our regression results showed that Restart was an important determinant of the overall outflow rate from male unemployment. This can be taken as evidence that the Restart programme played an important role in the cure of the partial hysteresis of unemployment. Steady state simulations, based on SUR estimates of duration-specific outflow rates, showed that approximately 35% of the fall in long-term unemployment between 1985 and 1990 can be attributed to the introduction of Restart. A strong substitution effect acting on the very short-term unemployed dampened this result. The Enterprise Allowance Scheme, while having no predictive power in the estimation of the overall outflow rate, seemed a well defined determinant of the outflow rates for unemployed with continuous spells of between two and three and more than four quarters. However, earlier evidence in the literature of some deadweight loss caused by EAS seems to be confirmed by our impact regression of EAS on duration-specific outflow rates.

Even though Ireland spends a larger fraction of GDP on active labour market policies than most OECD countries, the results in chapter 2 showed that the sum of the five employment schemes analyzed actually had a negative impact on the overall outflow rate from unemployment arising from the many distortive effects on the age-by-duration outflow rates. In an economy which has been depressed for long periods, choosing all the long-term unemployed as the disadvantaged group to be reintegrated into the effective labour supply might lead to "creaming off" effects leaving the "worst" in each targeted group behind. Very refined selection criteria need to be developed in an economy like Ireland's to ensure that the truly disadvantaged group is targeted.

Transition methodology was modified in chapter 6 to estimate hiring functions using regional panel data. The estimates suggested two stylized facts about the Polish labour market in the years 1991 and 1992. First, the labour market experience was different for men and women. Secondly, a well behaved matching technology could not be found. For women neither the stock of registered unemployment nor the stock of notified vacancies was a statistically significant determinant of the level of hirings, while for men hirings exhibited increasing returns to scale in unemployment, with vacancies having no predictive power. At the very high levels of unemployment, which the Polish labour market experienced in 1991 and 1992, increasing returns to scale might imply that, as unemployment rises even further, many male unemployed revise their reservation wages downward, thus boosting hirings.

The evaluation of passive and active labour market policies also showed different outcomes for men and women. Four consecutive positive absolute growth rates of "augmented total factor productivity" of male hirings in the first 4 months of 1992 was taken as evidence that the switch from an earnings-related to a flat rate benefit system increased search efforts by men. The pattern of the corresponding female growth rates of "augmented total factor productivity" lead us to conclude that search efforts of women were not influenced by the regime switch. Finally, the measures for training and public and 'intervention' works schemes impacted differently on male and female hirings. Training seemed to increase male hirings and had no effect on female hirings. The measure of public and 'intervention' works had no predictive power for male hirings, but was a statistically significant, negative determinant of female hirings. As many of the slots on public and 'intervention' works are known to have a much higher remuneration than the genuine jobs on offer to unemployed women, one explanation of this result could be that in those regions where the stock of "public" vacancies is high, women wait to be taken on a scheme and are not interested in taking up "private" jobs.

The different experience for men and women in the Polish labour market, which comes through in all regression results, seems to be driven by two things. Most job offers for the unemployed are "men's jobs", but also the distribution of reservation wages and wages for jobs on offer for unemployed men overlap considerably, while for women these distributions hardly overlap at all.

In chapter 3 we investigated annual net labour flows using a panel of Polish industrial firms over the period 1984-1988. A production function was estimated and the dynamics of labour adjustment examined. Using a simple neoclassical model of labour demand our major finding goes against the hypothesis that after the decentralizing reforms of the early eighties Polish state owned enterprises behaved like profit-maximizers. Firms whose wages exceed their marginal products of labour do not adjust their employment as predicted by this simple model. Additionally, the marginal products of materials of most firms were less than one, pointing to the inefficient use of inputs so common in firms in centrally planned economies and not consistent with profit-maximization.

Gross flows in two labour markets in transition were discussed in chapters 4 and 5. Chapter 4 described in detail the institutional environment which affected labour market transitions during the initial phase of the transformation of the Polish economy. The main findings were that in the period discussed demand and supply shocks, experienced across the socialized sector, were mainly responsible for the rapid rise in unemployment, while restructuring was not an important source of unemployment.

The introduction of Social and Monetary Union between the Federal Republic of

Germany and the GDR in July 1990 caused a contraction of employment in the Eastern German labour market unprecedented in German history. Chapter 5 documents the transitions between labour market states and between sectors within employment. Based on the estimated transition probabilities, steady state calculations point to an eventual Eastern German labour force of similar proportion of those in the West, but with a twice as high unemployment rate of 10%. The predicted composition of employment is also quite different, with an over-reliance on the service industries. Both the estimated transition probabilities and the logistic regression which are undertaken show, like in the Polish labour market, that the experiences for men and women were different in this initial phase of the transformation. This difference manifested itself especially in lower female flows from unemployment into employment. A further finding from the logistic regressions is that demographic characteristics are the most powerful predictors of transition probabilities, while the economic variables are for the most part insignificant in the determination of these probabilities.

Both transition methodology and Markovian flow analysis are tools which can be applied to labour markets in transition. The results from chapters 5 and 6 indicate that standard Western models of labour market transitions and hiring processes are at least a good starting point for the analysis of labour markets in transforming economies.
To the extent that the effectiveness of the sort of labour market policies examined in chapters 1 and 2 can be readily evaluated using flow analysis, then the prospect seems good for using similar techniques to examine and evaluate Active Labour Market Policies in the emerging market economies of Eastern Europe.

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