Labour Mobility in Britain: Evidence from the Labour Force Survey

Jonathan Wadsworth

Thesis submitted for the degree of Ph.D.

London School of Economics

March 1990

UMI Number: U615759

UMI

Dissertation Publishing

ProQuest

Abstract

Labour mobility is a means by which to allocate human resources efficiently. The movement of labour into areas or states where it can increase individual worth, benefits the aggregate economy. This thesis is an empirical investigation of five aspects of labour mobility in Britain. A recurring theme of this study is the interaction between unemployment and mobility. We utilise information from the British Labour Force Surveys as the basis for our study. Specifically we examine:

1) The impact of unemployment on the inter-regional mobility of labour. We find that unemployment experience, and not regional differentials, increase the likelihood of migration. Further the regional allocation process functions less effectively at higher levels of aggregate unemployment.

2) The job search behaviour of employed workers. We show how worker satisfaction, as principally captured by length of job tenure, plays the largest role in the decision to seek work. The type of search strategy undertaken is partly dependent on the level of local labour demand.

3) The influence of unemployment benefit on job search effort. We demonstrate how benefit recipients search more extensively than others. Benefit claimants have a higher probability of locating a job offer.

4) Labour market transitions. Utilising a specially constructed dataset, we estimate annual probabilities of movement between employment, unemployment and inactivity. Worker heterogeneity is shown to explain the majority of these transitions.

5) Inter-firm mobility. Job-shopping by workers is an essential pre-requisite for eventual long-term, productive job matches. High levels of unemployment are shown to impede the job-shopping process.

For my Mother and Father

Chapters 2 and 3 of this thesis are revised versions of articles co-written with my supervisor, Chris Pissarides. Chapter 2 is based upon 'Unemployment and the Inter-regional Mobility of Labour' published in *The Economic Journal*, September 1989. Chapter 3 appeared as 'On-the-Job Search: Some Empirical Evidence', Centre for Labour Economics Discussion Paper no. 317. In addition an earlier version of chapter 4 was published as 'Unemployment Benefits and Search Effort in the U.K. Labour Market', Centre for Labour Economics Discussion Paper no. 333.

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Chapter 1: Introduction

1.1 Overview

Labour mobility promotes the efficient allocation of human resources. If labour is able to increase its personal worth and productivity by a change of circumstance, then this will also enhance and facilitate growth in the aggregate economy. Mobility is undertaken as the result of individual optimising investment decisions. Over time, individuals continuously receive, update and process information which determines the relative costs and returns to movement. The aim of this thesis is two-fold. Firstly, we seek to investigate empirically aspects of labour mobility in Britain. Secondly, we seek to assess how differential levels of unemployment might affect observed mobility behaviour. We address this possible interaction against the background of the rise in aggregate unemployment that occured during the early eighties.

Throughout this study we shall be concerned with three possible channels by which unemployment could effect individual expected returns and subsequent mobility behaviour. Firstly, an individual's experience of the unemployed state may be sufficient to engender a divergence in the costs and returns to movement when compared with other groups. Differential access to informational outlets and flows could directly influence the probability of change. Secondly, regional unemployment differentials, which widened during the early eighties in Britain, may produce relative differences in opportunity across the country and so influence individual behaviour directly. Thirdly, the rise in aggregate unemployment could itself exert independent pressure on movement.

Workers may act differently during periods of low and high unemployment.

We proceed with our analysis within this general framework. Specifically we investigate: a) the extent of inter-regional mobility in Britain and the likely effects of unemployment thereon, b) the job search activities and strategies of employed workers and their dependence on local economic conditions, c) a comparison of the job search efforts of unemployed benefit receipients and non-receipients in an attempt to determine which group search more extensively, d) labour market transitions over the period 1983-84 and e) inter-firm mobility and the potential for unemployment influences. We discuss these issues more fully in section 1.3.

1.2 Data sources

We are primarily concerned with an analysis of individual mobility behaviour. We therefore utilise the largest and most comprehensive micro-data source available in Britain, namely the Labour Force Survey (LFS). The LFS is a random sample of around 0.5 per cent of private U.K. households. Begun as part of a European Community requirement in 1973, the LFS contains detailed labour market information on approximately 60,000 households. To a certain extent the hypotheses addressed in the following chapters are determined by the extent of information contained in the LFS. Though conducted bi-annually until 1983 and annually thereafter, this study draws principally on the 1977, 1983 and 1984 surveys, largely because these were readily available when this investigation began. A comparison between the former and latter two surveys does however serve as a contrast of labour market behaviour in periods of low and high unemployment respectively.

The LFS suffers from a degree of definitional inconsistency across

the years. Owing to the experimental nature of the survey during the seventies and early eighties, both content and definitions tend to vary somewhat. For example, the LFS classification of unemployment changed in every year until 1984. We have endeavoured to compensate for these inconsistencies wherever possible and have indicated in the text where survey differences may have influenced the outcome.

One major flaw in the LFS is the omission of any information concerning personal earnings or wealth. The designers of the LFS believe that the inclusion of questions seeking to ascertain earnings would be to the detriment of the other detailed labour market information. Yet since much of our foregoing analysis on mobility is often dependent on a monetary evaluation of the returns from particular labour market states, we have deemed it necessary to proxy earnings, or earnings potential, as best as possible. We therefore use regional, occupational and industrial LFS information to match individuals with wage data published in the annual U.K. New Earnings Survey. A similar technique is applied to match in additional external data which reflect economic conditions in the individual's local labour market. We obtain the relevant regional unemployment variable in this manner.

Finally, chapters 5 and 6 of this study utilise information from a longitudinal dataset specially constructed from the 1983 and 1984 LFS. Labour mobility is above all a dynamic phenomenon. Individuals react to changing circumstances over time. The standard LFS contains *some* dynamic information. Every year individuals are questioned as to the duration of their current state spell. In addition, a series of retrospective questions are proffered seeking to ascertain the respondents circumstances one year earlier. This information is sufficient for our purposes in chapters 2, 3 and 4. The retrospective data forms the

dependent variable in the regressions of chapter 2 and information on current state spell duration enters the vector of explanatory variables in chapters 2, 3 and 4.

Chapters 5 and 6 however are concerned with the effect of past actions in determining current status and mobility behaviour. The extent of retrospective LFS data is too limited to analyse these issues effectively. We have therefore found it necessary to construct a two period longitudinal dataset from the 1983 and 1984 surveys. By exploiting the 30 per cent sample overlap between successive surveys, as required under European Community directives, it has been possible to match the personal characteristics of over 7,000 individuals interviewed in both years. This has produced a dataset rich in detailed labour market information. We proceed to analyse how an individual's situation as observed in 1983 will influence the labour market status observed in 1984. Chapter 5 provides details of the construction of the dataset.

1.3 Unemployment and Mobility

Our adopted approach throughout much of this thesis utilises supply-side economic concepts. This stems from the nature of the LFS which concentrates exclusively upon the labour market activities of individuals. Consequently we have adopted economic theories which are primarily concerned with worker behaviour and movement, rather than the actions of firms. Search theoretic considerations therefore feature strongly in this study which owe much to the seminal works of Stigler (1962) and Sjaastad (1962). Individuals therefore undertake mobility decisions in an uncertain environment, on the basis of an evaluation of the expected returns from their actions.

1.3.1 Inter-regional Migration

In chapter 2 we attempt to assess the relation between unemployment and the inter-regional movement of labour. We therefore examine the ability of migration to act as an equilibriating force in Britain in response to unemployment differentials. We suggest three potential levels at which unemployment may influence mobility. Firstly, the unemployed are more likely to move than the employed. The cost of the former's mobility is lower and the potential rewards greater. Secondly, regional unemployment differentials may encourage mobility. Regions with above average unemployment offer below average probabilities of job placement and this can deter in-migration. Thirdly, at higher aggregate unemployment rates, the likelihood of migration should be lower. High levels of unemployment reduce the potential for gain everywhere.

We compare estimated migration probabilities using LFS data from two periods of differential aggregate levels of unemployment, 1976-77 and 1983-84. On the basis of our results we conclude that:

a) Unemployment experience does increase the likelihood of migration.

b) There is only a weak relationship between mobility and regional unemployment differentials, once we control for the propensity to experience the unemployed state.

c) High aggregate unemployment discourages mobility. Estimated migration probabilities are shown to decline during periods of rising unemployment.

These results indicate that the regional allocation process functions less effectively during periods of depressed demand.

1.3.2 On-the-Job Search

In order to undertake movement, workers must have previously engaged

in some form of job search. Chapter 3 examines the search activities of those workers who choose to search whilst employed. On-the-job search is an important area to study, since empirical evidence suggests that around half of all vacancies are filled from the stock of employed workers. Job to job changes account for around two thirds of all voluntary employment separations. We seek to identify the type of worker most likely to search on the job rather than not search or quit into search unemployment. We then analyse the methods of job search used by that subset of workers who choose on-the-job search.

Economic theory indicates that the first question, the likelihood of on-the-job search, is the product of the probabilities of undertaking search and the decision not to quit given search takes place. This introduces a degree of ambiguity into the theoretical analysis, since there are often competing influences on the explanatory variables from the underlying probability structure. Job search should be dependent on worker satisfaction and the potential gains from investing in search. We capture the former in a vector of individual and firm-specific characteristics and the latter in a vector of variables representing local economic conditions.

Having taken a decision to search, the worker then chooses the appropriate search stategy. This should maximise the probability of receiving an acceptable wage offer and is dependent on personal characteristics and the prevailing economic climate. We identify three main strategies. Random search involves direct approaches to potential employers. Indirect search invokes the use of employment agencies as intermediaries in the search for jobs. Self directed search locates job offers through the media or with the help of personal contacts.

Using 1984 LFS data we find that local economic conditions and

inter-industry wage differentials are positively correlated with on-the-job search. The strongest influence is however worker satisfaction and alternative worth as captured by job tenure. The aquisition of firm-specific capital reduces the gain to search. Job search strategies are shown to be dependent on search duration and economic activity. The most commonly adopted approach whilst employed, is self-directed search. Employed job seekers concentrate search efforts in their attempt to locate acceptable job offers.

1.3.3 Unemployment Benefits and Job Search

Chapter 4 examines the role of unemployment benefits in facilitating mobility. Benefits should raise the efficiency of the labour market if recipients use the additional income to finance job search activities rather than leisure. The probability of gaining employment is the product of the likelihood of receiving an offer and the probability that it is acceptable. Empirical work of the effect of benefits on unemployment outflow has concentrated upon the potential for these transfer payments to increase worker choosiness. Little attention has been devoted to the possible causality between benefits and job search effort. If the receipt of unemployment benefit induces workers to search harder, then this could nullify any reservation wage effect of benefits on unemployment duration. Chapter 4 attempts to address this problem.

Using 1984 LFS data we compare the search efforts of claimant and non-claimant as measured by the number of search methods used by unemployed workers to locate employment. Having first dealt with a potential selectivity problem regarding differential labour market attachment of the two goups, we find that benefit receipients search more extensively than non-receipients. We conclude that studies of

unemployment duration should incorporate an explicit allowance of this effect when seeking to establish a link between benefit provision and unemployment outflows.

1.3.4 Labour Market Transitions

Dynamic worker behaviour determines the stocks of unemployed, employed and the inactive. Current job search decisions affect future mobility. Chapter 5 examines this decision process by following the movement of workers across labour force states. This is achieved by construction of a dataset which matches individuals observed in two consecutive years of the LFS. This enables us to adopt a Markovian framework with which to analyse labour market transitions. We model the probability that an individual is observed in either employment, unemployment or inactivity in 1984, as a function of the state occupied in 1983. We estimate both gross and individual flows. The individual flows are based upon a reduced form approach that allows us to proxy the origin state by a vector of individual and state-specific characteristics.

The gross flow data contrasts the labour market experiences of prime age males with the rest of the population. We show that unemployment amongst prime age men is caused principally by employment separations and problems regaining work once lost. Teenage and much female unemployment is caused by an inability to find work on labour force entry. Whilst our results are subject to several caveats, notably a potential selectivity problem and identification difficulties that arise when estimating annual rather than instantaneous transitions, we find that heterogeneity dominates the individual transition estimates.

Differences in personal characteristics and environment explain the majority of unemployment and participatory flows. We find no strong evidence of any duration effects. In contrast, employment outflows are strongly dependent on the length of state spell. This is shown to be consistent with job-matching and firm-specific theories of turnover.

1.3.5 Inter-firm Mobility

Our final investigation concentrates on the movement of workers across firms. Over the course of a year, job-to-job movements comprise the majority of employment separations. We view these changes as an endeavour by workers (and firms) to move into long-term productive job matches. The longer a continuous spell of employment, the more valuable that match becomes and the less attractive alternative offers. Only by engaging in job shopping, can workers identify and move into "good jobs". Chapter 6 utilises LFS data to assess the extent of inter-firm mobility in Britain.

We present an outline of employee turnover over time, by industry and by occupation. The existence of long-term employment in Britain is calculated from 1983 data by calculating a series of eventual tenures. We estimate predicted tenure by extrapolating information on current incomplete employment durations. We estimate the likelihood of inter-firm mobility using the matched LFS dataset. This enables us to model a 1984 employment separation as a function of the firm-specific and environmental characteristics of the origin workplace.

We proceed to demonstrate the existence of a strong negative relationship between mobility and job tenure. This we argue is indicative of the strength of firm-specific capital cosiderations in

determining mobility. Long term employment relationships are shown to be a common feature of the British labour market. This stability is however only achieved by extensive job shopping early in a worker's career. This allocation process is adversely affected by high levels of unemployment. The mobility of workers living in high unemployment districts is reduced at all tenure levels.

Chapter 6 ends with an observation that runs throughout this thesis. We are therefore led to conclude in chapter 7 that the potential for labour mobility to act as an efficiency enhancing mechanism is reduced at high levels of unemployment.

Chapter 2: Unemployment and the Inter-Regional Mobility of Labour

2.1 Introduction

This chapter examines the relation between unemployment and the inter-regional mobilty of labour in Great Britain. In doing so we seek to assess the ability of migration to act as an equilibriating force in a dynamic economy, as envisaged nearly thirty years ago by Sjaastad (1962). We argue that unemployment might affect mobility at three levels. First, the status of a worker affects mobility: an unemployed worker is more likely to move than an employed one. Second, regional unemployment differentials encourage mobility: the probability that a given worker migrates is higher if the worker lives in a high unemployment region, and the larger the region's unemployment differential the higher the migration probability. Third, at higher overall unemployment rates the probability of migration is less.

The recognition of a link between unemployment and the inter-regional movement of labour is not new. Over one hundred years ago, Ravenstein (1885) documented the movement of individuals from the countryside into the major towns of Britain, which were said to offer more widespread opportunities for employment. Hicks (1932) commented that the main causes of migration were net economic disadvantages. Indeed any analysis of net inter-regional migration in Britain will reveal a tendancy for labour to move away from areas of high unemployment (see Armstrong and Taylor (1985) for example). Yet empirical verification of this process remains scarce. In his review article, Greenwood (1975) was moved to commment that one of the most

perplexing problems still confronting migration scholars was the lack of local unemployment rates in explaining migration.

One possible explanation is that previous applied work had relied upon highly aggregative data. This was often for want of an alternative. Hart (1970) using UK data, provides an early example of this type of approach and inconclusive outcome. Examination of net migration data obscures the observation that large numbers of workers simultaneously migrate to areas of depressed demand. For example, in the period 1983-84, 48,000 individuals left the Northern region of England, a traditional area of high unemployment. Yet there was a contemporaneous inflow into the region of 41,000. It is therefore conceivable that these contrasting movements of labour could render regional unemployment rates insignificant in any regression of net migration. A further explanation is given by Creedy (1974), who advances the idea of a differential response to local economic conditions by the employed and unemployed. He argues that the employed are more interested in regional income disparities, whilst the unemployed concentrate upon the relative chances of finding a job. Given that the former are in the majority this could be sufficient to return an insignificant unemployment coefficient in any net migration regression. This argument applies equally to studies of gross migration.

The advent of large, household survey datasets enabled empirical verification of these hypotheses to be undertaken. The first such examination was carried out by DaVanzo (1978) for the US, using cross-sectional evidence of gross migration behaviour from the Panel Survey of Income Dynamics. This study also gave the first empirical support to the additional idea that experience of the state of unemployment is a prime motivating force in the decision to migrate,

irrespective of the origin unemployment rate — something that would be impossible to ascertain using aggregate data. Schlottmann and Herzog (1981) pursued a similar applied approach in showing that controlling for labour force status affected the estimated coeffficients of other migratory determinants, particularly age and education which proxy the stock of human capital and are therefore highly correlated with the likelihood of being unemployed.

The most relevant UK empirical studies which utilise gross data are the series of papers by Hughes and McCormick (1981,1985a,1987). Whilst primarily concerned with the housing market and migration and with recourse to a dataset that records only migration intentions, the authors present results which suggest that the unemployed are more likely to consider migration. The notable finding of these studies — that council tenants are less likely to migrate — also has direct implications for any analysis of the unemployment–migration relationship, because of the proven positive correlation between local authority housing and unemployment (see Nickell (1980) for example).

Interestingly Hughes and McCormick (1981) contained a migration equation with a negative coefficient for the origin unemployment rate. This, together with two contemporaneous UK time series studies, suggests a third potential channel by which unemployment could influence migration — at the aggregate level. Articles by Pissarides and McMaster (1984) and Gordon (1985a) advanced the notion of a pro–cyclical response of mobility to economic conditions. The former show that migration responds positively to relative rather than absoulte regional unemployment differentials. Gordon (1985b) has shown that when aggregate unemployment rises, so relative unemployment in low (high) unemployment regions rises (falls)[1]. The implications for Pissarides and McMaster's

findings are that net in-migration to low unemployment regions will fall in bad times. Likewise net out-migration from high unemployment regions. Gordon (1985a) recognised that the level of economic activity would influence the probability of receiving and accepting job offers in different regions which in turn determine the migration probability. Evidence of a negative coefficient on the national unemployment rate is produced, which supports the idea that the ability of migration to act as an equilibriating mechanism is limited during a recession.

Thus in order to effectively assess the impact of unemployment, this chapter endeavours to draw together the disparate strands of the migration literature in order to produce a comprehensive empirical evaluation of the effect of unemployment on the inter-regional mobility of labour in Britain. We utilise gross migration data taken from the United Kingdom Labour Force Survey (LFS) in attempting to assess the impact of a) unemployment experience, b) regional differentials and c) aggregate unemployment. The first and second effects are derived from individual logistic regression probabilities estimated using data from a single LFS. We do this with reference to the 1984 survey. The third effect, however, cannot be estimated by using data from a single year, so we estimate the same regression for a second year with different aggregate unemployment, 1977, and compare the results.

In the next section we explain the role of unemployment in the context of a simple human capital model of mobility. Section 2.3 describes the data used for our study. Sections 2.4 and 2.5 report the results of estimating migration probabilities in 1983-84 and 1976-77, including the effects of personal characteristics and other economic variables. In section 2.6 we use the estimates to calculate predicted migration probabilities for various household types. These

probabilities, which give the best numerical summary of our results, are reported in Table 2.7. Our conclusions regarding the three effects of unemployment on mobility are summarised in section 2.7.

2.2 Theoretical Framework

In order to assess the response of migration to unemployment, we draw on aspects of human capital and expected income models of mobility embedded respectively in the works of Sjaastad (1962) and Harris and Todaro (1969). We model the probability of individual migration as a function of personal characteristics and market variables. Personal characteristics influence the migration decision mainly through the subjective cost of movement and the influence of market variables determines the net return to migration. However, because our data sources do not contain information on individual (or household) earnings, personal characteristics may also influence the migration decision through their effect on potential earnings. We have no means of distinguishing between the two effects in our regressions.

According to the human capital framework, labour will move if the net returns from so doing exceed the subjective cost of movement. The cost of movement depends on a number of observable characteristics (family circumstances, labour market status, etc) and on some unobservable ones. By assuming that the unobservable characteristics are randomly Weibull distributed across the population we can write the probability of migration as a logistic function of a vector of observed personal characteristics and market variables. We do not develop the model in detail, because it is familiar from several similar studies, notably Hughes and McCormick (1981,1985a) for Britain and DaVanzo (1978)

for the US. We list briefly instead the main arguments for the three effects of unemployment that we focus on. As far as we know, none of the earlier studies has explored the three effects together by making use of a micro data source.

Firstly, unemployed workers are more likely to move than employed workers because the cost of movement for them is less. Unemployed workers give up unemployment-related benefits in the region of residence. Most of these can be claimed in the region of destination, if the migrant is still unemployed. Employed migrants must be compensated for a job that they give up in the region of origin, which is necessarily more valuable than any unemployment-related benefits given up by unemployed migrants. The opportunity costs of unemployed migration are correspondingly lower.

Against this, we note two other effects pertaining to unemployment status that could work in the opposite direction. The first is that unemployed workers may have less access to the capital market than employed workers do and this may impede movement. If workers do not hold much liquid wealth other than their income, the marginal cost of moving is higher for the unemployed than for the employed. The interaction between the housing market and access to the capital market could also play a decisive role in the migration decision. The second effect is that employed workers may have better access to job information networks in other regions, especially if their own firm has establishments in several locations. Thus, within-firm mobility may offset to some extent the stronger relative effect of unemployment status on mobility.

Which effect dominates in practice is an empirical question. Our working hypothesis is that unemployment will increase the likelihood of

migration when we control for other personal characteristics.

The second effect of unemployment on migration operates through regional unemployment differentials. Regions with above-average unemployment should be losing population to other regions, even after we control for the effect of unemployment on those who suffer it. This effect, which may admittedly be weak having controlled for the effect of unemployment status, operates mainly through the probability of finding a job. Regions with above-average unemployment generally have below-average probabilities of job placement. Other things equal, this makes the high unemployment region less attractive than otherwise similar regions, especially for the unemployed. Regional unemployment differentials could potentially offset any inducement to migration offered by regional wage relativities, or indeed the reverse may be true [2]. The employed, however, may perceive a sufficiently high re-employment probability in the event of any future job loss, which could limit the effect of the regional unemployment differential on their migration decision. LFS evidence suggests that between 45 and 75 per cent of employees in our sample remain with their original firms after migration [3]. We explicitly test for a differential response to local economic indicators in section 2.5.

In our regressions we endeavour to capture the effect of differential job finding probabilities with three variables. These are the difference between the unemployment rates in the region of origin and the nation as a whole, the region's relative vacancy rate and a variable that measures the cost of the higher unemployment in the region of origin. The last variable is the product of the region's unemployment differential and the difference between the relative occupational wage of the individual and the replacement ratio. Thus, if

an occupation's wage is only slightly above the level of unemployment benefit, the cost of higher unemployment to the worker is less than if the wage were a good deal above the benefit level. The effect of unemployment differentials on migration should depend, in general, on the cost of unemployment to the worker.

Finally, we argue that at higher aggregate levels of unemployment migration propensities are reduced. This should be especially true for unemployed migrants, though it is also likely to be true for employed migrants.

At times of high unemployment, jobs are more valuable to those who have them. New jobs are more scarce and the job security associated with them is not in general as good as the job security afforded by existing jobs. Employed workers have more to lose if they give up an established post at times of high unemployment than at times of low unemployment, when their market power is higher. The more risk averse the individual, the stronger the effect. It is known that job quitting is much less at times of high unemployment (see Nickell (1982)) and migration by the employed is also likely to be lower.

Unemployed workers are also less likely to move at times of high unemployment, for several reasons. When unemployment is high, the unemployed expect to spend a longer time in unemployment, wherever they are. Thus, any gain in expected income, anticipated after a move, is partially mitigated, as expected employment probabilities fall.[17]

The capital market constraints facing the unemployed are likely to be more severe at times of high unemployment. This is again related to the fact that re-employment probabilities are lower when overall unemployment is higher, so the unemployed workers' earning potential suffers. As expected re-employment is pushed further into the future,

the unemployed expect to run down more assets and re-enter a job with less overall wealth. As a result, they are likely to become more thrifty during unemployment. One obvious economy is staying put in their place of residence, avoiding the necessary relocation expenses of a move. Any existing benefits, like subsidised housing, could become more valuable at the margin under these conditions, and those of the unemployed who enjoy them may be less keen to risk losing them by moving region.

The first two effects of unemployment on mobility, through own status and regional differentials, can be estimated from a single data source. But because aggregate unemployment (and the replacement ratio) are the same for each region, we cannot estimate their effects from a single source. Ideally we require a panel but as we do not have one, we follow the next-best procedure [4]. We estimate the same regression for the probability of moving in two years of different aggregate unemployment rates, 1976 and 1983, and compare the results. The average replacement ratio in 1976 was 41 per cent and in 1983 it was 42 per cent, so it would not be reasonable to attribute any of the observed changes in migration behaviour to it.

In addition to unemployment and vacancies, we use one other regional economic variable in our regressions, the relative wage in the region of origin. Workers living in regions with high relative wages in their occupation are more likely to remain, even if unemployed, so out-migration from the region is likely to be less. We also experimented with the relative wage of each region with respect to London and the South East, because of the dominant role of this region in the economic life of the country, but the results were not sufficiently different to warrant separate reporting.

2.3 Data and Estimation

Most of the data used in our study come from the United Kingdom Labour Force Surveys (LFS) and relate to migration in the periods 1976-77 and 1983-84. The LFS is a random sample of approximately 0.5 per cent of all residential households. Detailed information is available on an individual's regional and socio-economic circumstances both current and one year prior to sampling. Estimation is by logistic regression. Hence the individual annual probability of migration from region k is given by

$$Pik = \frac{1}{1 + \exp[-(\beta Xik + \gamma Zk)]}$$

where Xi is a vector of personal characteristics and Zk is a vector of regional specific variables. We restrict our sample to household heads. Mincer (1978) argues that the decision to migrate is based on a consideration of a variety of household attributes, for example wifes' labour force status, or presence of dependent children. Yet the prime motivator in any decision to move remains the household head for whom any relationship between unemployment and subsequent mobility is likely to be the more direct [5]. Similarly, in order to concentrate upon economically motivated mobility, our sample contains only those workers who were observed in the labour force in both reference years of the respective surveys and who belonged to the population of working age.

The data governs our definition of mobility, where now an individual is deemed to have migrated, if his region of residence (one of the 10

standard regions in Great Britain) differs from that of one year ago. The dependent variable takes the value one if migration occurs and zero otherwise. We ignore the region of destination, so implicitly we are treating the rest of Great Britain as the single destination of all migrants from a given region. Migration to and from Northern Ireland and abroad is also ignored. It may be argued that migration is a two-step process, incorporating both an initial decision as to whether to migrate or not and a subsequent choice as to the region of destination. Molho (1987) provides an interesting attempt to model the second stage of the process using discriminant analysis. Here we concentrate on the initial migration decision which readily lends itself to the binary framework imposed by logistic regression.

The economic variables used in our study, reflecting a region's economic well-being, come from different sources. Since we cannot disaggregate below the ten standard regions the economic variables are not entirely perfect measures of local labour demand, which is perhaps best defined within the travel to work area [6]. Following Hughes and McCormick (1985a), who highlighted the distinction between blue and white collar workers which characterises British mobility, we disaggregate the economic variables as far as possible by occupational status. This is to take account of the fact that the labour market conditions facing manual and non-manual workers are different and that unemployment for manual workers deteriorated by much more between 1976 and 1983 than unemployment for non-manual workers. Our estimates indicate that the male unemployment rate rose from 8.4 per cent in 1976 to 18.2 per cent in 1983. This compares with a corresponding increase from 3.0 to 7.0 per cent for non-manual males. The unemployment rate used to calculate differentials is the one based on registrations, as

the rate based on the LFS definition is not widely reported and generally not known to potential migrants. The definitions and sources of all data are given in the Appendix.

Table 2.1 reports summary migration data from the LFS and the mean values of the economic variables used in our regressions in each of the two survey years. A very small percentage of households migrate in each year, just over 1 per cent, with more unemployed households migrating than employed relative to their number in the population as a whole. The percentage of employed households migrating has not changed much between the 1977 and 1984 surveys but the percentage of unemployed households migrating fell dramatically, from an average of 2.74 per cent of all the unemployed in 1977 to 1.77 per cent in 1984. Despite this, the overall average (absolute) net migration rate fell only slightly from 0.316 per cent in 1977 to 0.307 per cent in 1984. The pattern of net migration flows in column 3 shows that whereas in 1977 there was no clear discernible trend, by 1984 almost all the net flow was absorbed by three regions, East Anglia, the South West and Wales.

Column 4 shows the employment status of the migrant. In the period 1976-77 the proprotion of the migrant stock who were unemployed exceeded the unemployment rate, given in column 5, in every region. This situation no longer held in 1983-84 and the ratio of columns 4 to 5 declined over the period, confirming the fall in unemployed migrants. Column 6 gives the regional vacancy rate (uncorrected for partial notification and taken as a percentage of the labour force of each region). The vacancy rate is used as another complementary proxy of demand conditions in each region.

Column 7 gives the last of the economic variables used in our

regressions, relative wages. The variation in relative wages across regions is much less than the variation in unemployment or vacancy rates. The main feature of relative wages is the difference between the South East and the rest of the country, where wages appear to be largely uniform. The high wage in Scotland is probably due to North Sea oil operations whereas the high wage in the North in 1977 appears to be an aberation. The earnings disparity between the South-East and the rest of the country rose by some two percentage points over the period.

The personal characteristics used in our regressions refer to the head of household[7] and are largely the same variables used in earlier studies. These are age, educational qualifications, marital status, sex, and the presence of a working wife or dependent children. We also use a dummy variable for manual workers to determine whether they are less likely to move when we control for other characteristics, together with various industry dummies, as some industries may be more location-specific than others.

An important variable in our regressions is housing tenure, shown previously by Hughes and McCormick (1981) to affect mobility. For 1977 we do not, unfortunately, have data on housing tenure. Because of the importance of this variable in the migration regressions, rather than omit it we develop a prediction equation for tenure from the 1984 data. By multiplying the estimated coefficients with the equivalent variables in the 1977 LFS we calculate the probability that a household in 1977 belongs to one of three tenure categories, council housing, private rental and owner occupation. A similar instrumentation approach was adopted by Mohlo (1987).

We estimate regressions for employed and unemployed workers jointly with and without interaction effects. The reason for the interaction

effects is that employed workers may respond differently to the economic incentives than unemployed workers do. We have already argued that unemployed workers may be more responsive to unemployment differentials. Also, employed workers may be more responsive to relative wages than unemployed workers, for whom finding a job is likely to be more important than a small change in the earnings differentials of those already in work.

2.4 Migration Results for 1983-84

Table 2.2 reports the estimated equation for 1984, i.e. for households who migrated between 1983 and 1984. The effects of the household's socio-economic characteristics conform to prior expectations and we mention their main features briefly.

The likelihood of migration declines with age. The expected returns from migration will be lower the older the individual and the expected costs larger (particularly the psychic costs of moving). Location and family ties impose a greater barrier to mobilty for older households. Increased educational qualifications are associated with higher income profiles and more varied career structures. The labour market for graduates is often national rather regional. Hence workers with no formal qualifications face the greater difficulty in moving. All these effects are strongly significant and monotonic. Single household heads have fewer locational ties and a lower opportunity cost of moving. Hence their higher propensity to migrate. Female household heads, who are necessarily single, are less likely to migrate than married or single men. This is perhaps surprising , since single women will generally be primary workers and might be expected to behave in the same manner as

married men. It may be that the obesrved constraint on mobility imposed by the presence of dependent children operates more strongly in households headed by women. The results on variables representing family circumstances suggest that the most likely migrant is a young married couple with non-working wife and no children.

The manual status dummy has no additional explanatory effect on migration when we disaggregate our economic variables according to occupation. Working in manufacturing, energy or construction has negative effects on migration, when compared with working in services, agriculture, forestry and fishing.

Living in council accommodation has a strong negative effect on migration, confirming the results of Hughes and McCormick (1981, 1985) who used what we believe is an inferior data base, the General Household Survey[8]. Hughes and McCormick and others have written extensively how the policy of local authorities towards council tenancy may give rise to this effect. The nature of the housing system is such that when council house tenants migrate they lose their right to immediate occupation of another council property. Perhaps surprisingly, living in privately-rented accommodation also reduces the probability of migration, making owners-occupiers the most mobile group. However, the number of people in privately-rented accommodation is small and many of them are in controlled tenancies, making them similar to council tenants. Our estimate, which is the only significant one that does not conform to expectation, is almost certainly due to the behaviour of a very small number of households and as we shall see later it is not robust.

The estimated economic incentives to migration are shown at the bottom of the table. Households with unemployed heads are more likely

to move than households with employed heads. Thus, our first effect of unemployment on mobility, through own status, is strong and significant. Our second effect, however, operating through unemployment differentials, is weaker and not always of the right sign. When we enter the regional unemployment differential interactively with the net gain from employment (relative occupational wage minus replacement ratio) we obtain a negative coefficient, contrary to expectation. The estimated direct effect of the unemployment differential is correctly signed but significant only at the 90 per cent confidence level. Taken together the two effects are jointly significant (Likelihood Ratio test =15.31 ~X^2(2)). The net effect of the two variables is to reduce the mean probability of migration by 0.3 percentage points[9], so there is no evidence of a strong link between regional unemployment differentials and migration. Note that in Table 2.3, Model III produces a significant negative coeficient on the unemployment differential when entered alone without the interaction term.

Hughes and McCormick (1981) estimated a negative effect of regional unemployment differentials on migration, contrary to the theory, and early US studies failed to find a significant unemployment effect (see Greenwood, 1975). The estimated wrong sign cannot be attributed to regional fixed effects because if we introduce as many regional dummies as there are regional degrees of freedom (5 in Model II of Table 2.3) we obtain insignificant estimates for the regional parameters, with no important change in the unemployment coefficients. (The Likelihood Ratio test for the joint significance of the regional dummies =3.30 ~X^2(5), which is rejected at the 95 per cent level). Goss and Schoening (1984) suggest that the lack of significance of regional unemployment differentials in the US is due to a concentration of long-term

unemployment, with a subsequent decline in search effort, in high unemployment regions. Although we cannot replicate their results due to data limitations, (the LFS does not contain any retrospective information regarding the unemployment durations of those unemployed one year prior to sampling), it is certainly true that high aggregate unemployment in the UK is associated with the growth of long-term unemployment and a reduction in job search activity. See Chapter 3 for some empirical evidence regarding the latter.

Of course, even a significant and wrongly-signed regional unemployment effect does not imply that regions with higher unemployment will be experiencing below-average outflow of migrants. Unemployment, as we saw, has a strong positive effect on those experiencing it. The overall effect of unemployment is the sum of the two effects and since the coefficient on the unemployment dummy is much higher than the total coefficient on the differential (i.e. the sum of the two estimated coefficients, with the one on the interactive term weighted by the income gain from employment), the overall effect of unemployment on migration is positive.[10] This is also confirmed by those time series studies, which find a positive relation between the regional unemployment differential and net migration from the region (Pissarides and McMaster (1984), for example). Our estimates in this paper imply that the reason for the effect is not a response to the unemployment differential itself but the fact that the unemployed are more likely to move than the employed.

The inclusion of the region's relative vacancy rate as another proxy for the relative chances of finding a job in a region, produces an incorrectly signed but unstable coefficient.[11] It is therefore unclear as to the type of signals that vacancies offered the potential migrant

in the period 1983-84.

Model I of Table 2.3 gives the results of alternative specifications of the probability of migration. As an additional variable measuring the effect of housing costs on migration we tried relative house prices for each region. We included this variable on its own and interacted with the owner-occupier dummy. In a throwback to the old " gravity " models of migration, we also experimented with a distance variable, measuring distance as a population-weighted average of the mileage between the largest city in the region and the largest cities in all other regions as a means of defining the relative economic opportunities between areas. In each case the estimates were always insignificant, and our inferences regarding the other estimated coefficients did not change substantially.

Thus, to conclude our discussion of the effects of unemployment on mobility in 1983-84, we find that unemployment has a strong effect on the likelihood that those who experience it will migrate but that regional differentials in unemployment and vacancies do not appear to exert an independent influence on migration.

In contrast, regional wage differentials have the strong incentive effect on migration familiar from other studies. Households living in regions where their relative occupational earnings are low are more likely to move than similar households living in other regions. Combined with the effect of unemployment, what we therefore find is that regions with high unemployment and low relative earnings are likely to have higher out-migration than other regions.

2.5 The Effect of Aggregate Unemployment

The effect of aggregate unemployment on migration decisions cannot be ascertained from data for a single year, so the regressions we have estimated so far are not helpful in this respect. As there is no panel in Britain where households are followed during a time of changing aggregate conditions,[12] we compare identical regressions estimated with data from two surveys taken at times of different unemployment. The years we chose (1976-77 and 1983-84) are such that unemployment was stable and low in the former, 3.2 per cent on the LFS definition in 1976, and stable and high in the latter, 8.6 per cent. No other aggregate variable of potential significance changed much between the two years. Nevertheless, the caveat should be borne in mind that our conclusions about the effects of aggregate unemployment depend on the comparison of two different samples taken at two different times and there may be other hidden factors that changed between the two years and which we have not been able to identify. Also, although our overall sample is large in each survey year, the number of migrants is small and so comparisons may be subject to small-sample bias.

Before estimating the migration regression for 1976-77 we have to deal with a potentially serious problem in the 1977 survey, the absence of data for housing tenure. We saw that living in council accommodation discourages mobility. Since council accommodation is likely to be highly correlated with unemployed head of household, if we omit housing tenure from the regressions we are likely to under-estimate the effect of unemployment on mobility. For this reason, we first develop a prediction equation for housing tenure utilising 1984 data and use this to estimate the probability that a household sampled in 1977 is in one

of our three tenure categories.[13]   To identify correctly the housing

tenure and migration probabilities we need one or more variables that

influence the tenure probability in the region of origin but not the

migration probability. For this we include the proportion of households

in different tenures in each region, which should influence the tenure

probability of randomly-sampled households but not the migration

decision of any particular household.   The tenure regressions also

contain the same personal characteristics of the household as in the

migration regressions. The results are given in Table 2.4.   The

identifying variable is highly significant in each regression with the

expected sign, and the predictive power of the regressions is high.

An important finding of the tenure regressions is that unemployed

households are much more likely to be council tenants than employed

households.   Since in the migration regressions we found that council

tenancy is a deterent to mobility whereas unemployment is an inducement,

the positive association between council tenure and unemployment

confirms that if we omitted council tenancy from the 1977 regression we

would be under-estimating the effect of unemployment on mobility. In

contrast, the prediction equation for private rentals shows that

unemployed workers are less likely to be in privately-rented

accommodation than employed workers.

The effect of the socio-economic variables conforms with our

expectations of how housing tenure is determined. Council tenants are

more likely to be outside the prime age group, to have left school

without many formal qualifications and to be manual workers. Single

households, particularly those headed by women, are also more likely to

be in local authority accommodation. This probability is further

enhanced if the occupant is a single parent. The private rental housing

market is also dominated by young, single people.

We use the predicted tenure probabilities as independent variables in the migration regressions, all of which are numbers between 0 and 1. We avoided the alternative of constructing a 0-1 dummy based on an arbitrary cut-off. For this reason, the coefficient estimated for tenure with the predicted probabilities is not directly comparable with the one estimated with the 0-1 dummy in the regression of Table 2.2. For direct comparability with the 1976-77 migration regression, we re-estimate the 1983-84 migration regression by substituting the 1983 predicted probabilities of tenure for actual tenure. The results are presented in Table 2.5.

A comparison of the coefficients estimated with the 1984 data in the equations reported in Tables 2.2 and 2.5 shows that the estimates for unemployment, vacancies and relative wages are very similar across the two regressions. The coefficients on the personal and socio-economic characteristics are also similar to before. The effect of council tenure is less strong now, and the standard error of the estimate has increased, so we lost some precision. This change is to be expected when a variable is instrumented. The negative effect of private rental has collapsed and it now has a sizeable but insignificant positive effect. The change in this variable may be due to small numbers but if anything the estimate with the predicted values makes more sense than the one with the 0-1 dummy. As with 1983-84, private rental in 1976-77 has a positive influence on migration, and council accommodation has a strong negative influence.

The important thing for our purposes is that the economic variables with predicted tenures in 1983-84 perform as before and that the new regression is directly comparable with the one estimated with the 1977

data set. Comparing now the two regressions in Table 2.5 we find that the effects of the socio-economic variables in the two years are very similar, except for the effect of education and industry. Education, however, is not measured precisely in the 1977 survey[14] and these differences may be due to the different measure of education in the earlier year. Nevertheless, the same monotonic increase in mobilty with educational attainment is observed across both years. The significance of the manual status dummy in 1976-77 may also reflect partly the imprecise measurement of education, as manual workers are likely to be concentrated in the low-education groups.

Notable differences between the 1977 and 1984 results exist in the effect of the economic variables. The effect of unemployment on the households experiencing it is twice as large and better determined in 1976-77. This conforms with our priors: unemployed households are still more likely to move than employed households when overall unemployment is higher, but the incentive is reduced. The unemployment differential has a positive effect in 1976-77 , as in 1983-84, and relative vacancies are now significant and correctly-signed. But once again the unemployment differential interacted with net gain from employment has an additional negative effect. The two effects of the unemployment differential combined imply that unemployment differentials have no independent role to play in migration decisions. In this respect, the 1976-77 results are similar to the 1983-84 ones. But relative vacancies lose their significance in 1983-84 and their sign is reversed. Thus, if the differences between the 1976-77 and the 1983-84 results are due to the higher unemployment in 1983-84, we can conclude that higher overall unemployment reduces both the likelihood that unemployed workers will migrate and the effectiveness of the incentives to migrate provided by

vacancy differentials. Unemployment differentials are ineffective in both cases.

In contrast, relative wages are correctly-signed and strongly significant in both years. The coefficient estimated in 1983-84 is higher than the one estimated in 1976-77 so, if anything, the incentives provided by relative wages are stronger in the high-unemployment year. However, as these are logit coefficients, direct comparisons between them can be made only if the baseline probability of migration is the same in the two years, (see footnote 9). This is certainly not true for the unemployed.

Utilising American data, Da Vanzo (1978) tested the hypothesis that the reason for the insignificant response to unemployment differentials was that only the unemployed are concerned with regional unemployment disparities. Since the unemployed comprise a minority of the labour force, their response would be subsumed by the employed majority. By interacting the economic variables with the unemployed household dummy she obtained significant and correctly-signed estimates of the response to economic regional differentials by the unemployed alone. Hughes and McCormick (1985) report similar but weaker findings for the UK. In Table 2.6 we report our attempts to replicate this exercise.

None of the interaction terms were significant. There is only weak evidence of a differential response by the employed and unemployed to economic signals. The signs of the coefficients on regional unemployment and wages are diametrically opposite for the two groups, but there is little consistency of response across the two years. The unemployed responded less to wage relativities and more to unemployment differentials in 1976-77, but this was reversed by the period 1983-84. Whilst it therefore appears true that the coefficients in Table 2.2

reflect primarily the response of the employed majority, the response by the unemployed is not perceptibly different.

2.6 A Comparison of Migration Probabilities, 1976-77 and 1983-84

Since calculations of the marginal effects of each variable on mobility are dependent on the choice of baseline probability, a better way of comparing the migration propensities implicit in the estimates reported in Table 2.5 is to calculate for each year the predicted probabilities for some typical household types based on a collection of socio-economic characteristics. We do this for three standard cases and then compare the effects of various factors on each. The results are given in Table 2.7.

Our first case concerns the group most vulnerable to unemployment: a manual worker in manufacturing. We take as our baseline a household head who is unemployed, because of our interest in the effects of unemployment on mobility, though obviously unemployed household heads are in a small minority. Our second case concerns another group vulnerable to unemployment but now non-manual and with some lower education qualifications. The third group we analyse is the group of household heads least likely to experience unemployment: married men with university degrees working in the service industries. For this group all the probabilities we calculate are for employed households.

Housing tenure for each household is not given in the Table because it is predicted using the instrumentation equations in Table 2.3.[15] Where there are regional characteristics in either the tenure equation or the migration equation we use sample means unless otherwise specified.

The first four rows of Table 2.7 show the effects of personal socio-economic characteristics on migration. Migration probabilities rise as we move from manual to non-manual and (for employed workers) to professional. The most mobile group amongst the employed are couples headed by young professional men whose wives are not in employment. Age has a large influence on migration, together with wife's labour-market status.

Comparing rows (1) and (2) we find that unemployed men are more likely to migrate than similar employed men. The differential is not as great as the coefficient on unemployment in Table 2.5 may suggest because of the interaction between council tenure and migration. Households headed by manual men are most adversely affected by this interaction. For 1983 we predict a probability of 0.71 that an unemployed, manual man is a council tenant. The probability for similar employed men is 0.32. Unemployment raises the probability of migration but it also raises the probability of council tenure, which has a depressing effect on migration. Nevertheless, our first effect of unemployment on mobility – that unemployed household heads are more likely to migrate – is confirmed for all household types even when the effect of unemployment on housing tenure is taken into account.

Our second unemployment effect – that unemployment differentials should be an inducement to migration – is not confirmed, as comparison of rows (1) and (6) makes clear. If regional unemployment is above average, migration probabilities are (very slightly) lower. But relative vacancies have the expected effect in 1976-77 and relative wages have the expected effect in both years.

The most useful comparisons that can be made using Table 2.7 concern our third effect of unemployment on mobility, that at higher aggregate

unemployment mobility declines. This is confirmed for all the
unemployed household types we consider (subject always to the proviso
that the main factor behind the differences between the 1976-77 and
1983-84 probabilities is aggregate unemployment). The probabilities for
employed manual and non-manual workers also fall but for the
professional men they generally rise (though they fall for the most
mobile age group). Aggregate unemployment also weakens the economic
incentives to migration. We have already seen that relative vacancies
lose their incentive effects entirely (they even change sign). Relative
wages retain the same directional influence, but the response is weaker
because the baseline migration probability is now much lower.[16]

The effect of unemployment on the strength of the economic
incentives (including own unemployment) is, potentially, more serious
for the allocative function of migration than any direct effect on
average probabilities. The allocative function of migration depends
mainly on *net* migration between regions. What we have found here is
that the average *gross* migration declines. But if the response to the
economic incentives remains strong, the only effect of the overall
decline in flows would be slower adjustment at given relative regional
performance. Increased divergences in performance would speed up the
adjustment. With the collapse in the response to economic incentives,
however, this is much less certain. If neither unemployment
differentials nor vacancy relativities have an effect on migration,
however large the regions' differences in performance, adjustment will
not take place. Unless of course relative wages are allowed to deviate
by more between the regions and, when they do, they retain their strong
allocative function that we have estimated. There is little indication
from Table 2.1 that relative wages in Britain are sufficiently diverse

for this to occur. The ability of regional labour markets to adjust effectively to relative economic distortions must therefore be questioned.

2.7 Conclusions

We have examined three potential channels by which unemployment may influence the inter-regional mobility of labour, using data from two Labour Force Surveys, 1977 and 1984. Our conclusions regarding each effect are:

(a) *Unemployment experience increases the likelihood of migration.* This is confirmed by both sets of data. The partial effect of own labour market status (i.e. when controlling for all other household characteristics) is stronger in 1976-77 than in 1983-84. When allowance is made for the fact that unemployed men are more likely to find themselves in council accommodation, which is itself an impediment to mobility, the effect is much weakened in both years. Yet it remains strong and significant for all household types.

(b) *Households living in regions with higher unemployment are more likely to move.* This is not generally confirmed by either set of data. Regions with above-average unemployment do have larger outflows of migrants than regions with average or below-average unemployment (other things constant) because of our first effect, not because of the incentive effects of unemployment differentials. Neither can we attribute this observation to a differential response to economic signals by the employed and unemployed, since we were unable to uncover any evidence of this in our investigation. In 1976-77, unemployment

differentials exerted a small influence in the right direction on households headed by men in high-wage occupations. In 1983-84 the net effect was in the wrong direction (but again very small) in virtually all occupations. Two more relevant points can be made with regard to the incentive effects of unemployment differentials. Firstly, regional vacancy differentials influenced migration in 1976-77 but not in 1983-84, so an incentive reflecting relative regional prosperities was operating effectively in the earlier year. Secondly, regional earnings relativities exerted a significant influence on migration in both years. Thus, when all the economic effects on migration are combined, there is evidence that there is a statistically-significant flow in the 'right' direction: gross outflows from high unemployment, low vacancy (in 1976-77) and low wage regions are higher than gross outflows from other regions.

(c) *At higher overall unemployment rates, migration propensities are reduced*. We examined this hypothesis by comparing the results from the low unemployment years 1976-77 with the corresponding results from the high unemployment years 1983-84. We found strong confirmation of our priors at two levels. First, the average propensities of all unemployed household types (and to a lesser extent those of employed manual and non-manual wage-earners) are lower in 1983-84 than in 1976-77. For employed professional men in service industries the migration probabilities are generally higher in 1983-84. Second, the response to the economic incentives, primarily provided by wages and vacancy rates, is reduced in the high unemployment years. Thus, when aggregate unemployment is higher the regional reallocation process functions much less effectively than when aggregate unemployment is lower, both on average and at the margin.

Footnotes

*   We are grateful to the Department of Employment, the Economic and Social Research Council and the Esmee Fairbairn Charitable Trust for financial support.

1   The same article also shows that regional unemployment differentials tend to widen as aggregate unemployment rises.

2   Whilst an undoubtedly valid argument in the context of rural-urban migration as envisaged by Harris and Todaro, the situation is unlikely to hold in Britain because of the tendancy for high wage regions to be simultaneously low unemployment areas.

3   The proportion of migrant employed heads of household remaining with the same firm the same firm was 46.6 per cent in 1976-77 and 75.3 per cent in 1983-84.

4   Alternatively, time series regressions with gross flow data can also be used to estimate the effects of these variables. Gordon (1985) estimated the effect of unemployment by using gross flow data for Scotland and found it to be significant. See also Ogilvy (1982). Some inferences about this effect can also be made with net flow data. See Pissarides and McMaster (1984).

5   Secondary workers may be obliged to change jobs or even suffer unemployment as a result of a decision to move by the head of the household.

6   For example in 1983 the unemployment rate within the Yorkshire and Humberside region ranged from 5.0 per cent in Pickering to 20.9 per cent in Mexbrough.

7   By Labour Force Survey definitions, the head of a household consisting of a married couple is always the male.

8   The General Household Survey that they used records only migration intentions (and not actual migration) for the unemployed.

9   The effect of a single explanatory variable, x_i, on the probability of migration, P, is given by

$$\frac{\delta P}{\delta x_i} = B_i \ P[1-P]$$

where P is evaluated at the sample mean and B_i is the estimated coefficient for x_i. .

10   The two coefficients are comparable because on average if a region's unemployment rate goes up, say, by 0.01, the unemployment differential rises by 0.01 and the sample mean of the unemployment dummy for this region also rises by 0.01.

11   Tests with the differential in vacancy rates gave similar results. We prefer to use relative rates because of the lack of notification of many vacancies. If the unnotified vacancies are proportional to the notified ones across the regions our procedure corrects for lack of notification.

12   To our knowledge this has also not been done for the United States, where the panel on Income Dynamics provides a suitable data base.

13   Molho (1987) also instruments tenure in his regression because, although he has data for 1979, the year of the LFS that he uses, he does not have it for 1978, the year before migration. However, the variables that he excluded from the migration regression to obtain identifying restrictions appear arbitrary. See p.241 of his article.

14   The 1977 LFS disaggregates educational qualifications into 8 broad

categories. This compares with the 14 groupings in 1984 , not all of which are directly comparable with the earlier survey.

15 To give an indication of the effect of council tenure on migration we report here the mean predicted probabilities for our standard cases of manual and non-manual workers, obtained for 1983-84 from the regression of Table 2.2, when the respondents are council tenants and when they are not. For council tenants the migration probabilities are, respectively 0.15 and 0.23, and for owners occupiers they are 1.50 and 2.18.

16 The time series results of Pissarides and McMaster (1984) confirm that at higher unemployment the response of net migration rates to unemployment differentials is weakened, whereas that to relative wages is largely unchanged.

17 It may be argued that a rise in aggregate unemployment would widen absolute regional unemployment differentials and so increase the incentive to migrate from high unemployment areas. There are however a number of reasons why this may not hold. A decline in aggregate economic activity reduces labour turnover (see for example Burgess and Nickell (1987)). Fewer job hires mean less job openings everywhere. Further, Pissarides and Wadsworth (1987), (Centre for Labour Economics Discussion Paper No. 296), show that the existence of a risk averse utility function amongst workers -is sufficient to make the subjective cost of migration a rising function of the average unemployment rate.

Appendix A2

Data Sources

All socio-economic variables are taken from the 1977 and 1984 Labour Force Surveys as provided to us by the UK Office of Population Census and Surveys and the ESRC Data Archive. We include only households who in the year of the survey and one year prior to the survey were classed as 'economically active', i.e. either employed or unemployed on the LFS definition. The information that we use is derived from the 'retrospective' question, which seeks information about the household's situation one year prior to sampling. Migrants are defined to be the households who report a different region of residence in the retrospective question from their region of residence at the time of sampling.

In addition we have supplemented the LFS datasets with information from the following sources.

1. Unemployment differential

Regional male and female unemployment disaggregated by manual/non-manual status (seasonally adjusted) was obtained from Department of Employment *Gazette*, Table 2.12. These were converted into rates of unemployment by using employment estimates from the Labour Force Survey, for each sex and occupational group in each region. The unemployment differential is the difference between the regional rates and the Great Britain average for each group at June of year t-1 (1976) and November of year t-2 (1982).

2. Vacancies

Ratio of region's notified vacancies as a percentage of region's labour force to Great Britain average at June of year t-1 disaggregated by manual/non-manual status. *Source:* Department of Employment *Gazette*,

Table 3.4.

3. *Employment*

All employees in employment disaggregated by region at June of year t-1. *Source:* Central Statistical Office *Regional Trends*, Table 7.1.

4. *Wages*

Average hourly earnings of full-time men and women, disaggregated by region and 16 occupational groups measured relative to Great Britain average. Each household is allocated the relative wage relevant to his occupational group and region. *Source:* Department of Employment *New Earnings Surveys* (1976 and 1983), Part E, Tables 122 and 123.

5. *Cost of Unemployment*

This is an interactive variable. We multiply the region's unemployment differential by the difference between the occupational wage and average unemployment benefits, the last two divided by the average wage in Britain.

6. *House Prices*

Average dwelling price disaggregated by region and relative to average British price in year t-1. *Source:* Central Statistical Office *Regional Trends*, Table 3.15.

7. *Distance*

This is an average of the distance between regional capitals (North=Newcastle, Yorkshire=Leeds, East-Midlands=Nottingham, East Anglia=Norwich, South-East=London, South-West=Bristol, West-Midlands=Birmingham, North-West=Manchester, Wales=Cardiff, Scotland=Edinburgh), weighted by the regional population. The higher the variable, the more 'distant' the region.

Table 2.1

Regional economic data

(a)   1984 Labour Force Survey (data for 1983)

	Employed out-migrants as % of employed stock	Unemployed out-migrants as % of unemployed stock	Net migration as % of labour force	% of out-migrants who are unemployed	Unemployment rate (%) (LFS definition)	Vacancy rate (%)	Relative wage
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
South East	0.95	2.91	-0.09	14.0	6.0	0.58	1.07
South West	1.79	2.98	0.67	9.8	6.1	0.75	0.93
East Anglia	1.20	5.80	0.52	21.0	5.2	0.66	0.95
East Midlands	1.21	1.23	0.20	6.7	6.5	0.57	0.94
West Midlands	0.98	1.32	-0.23	15.6	12.1	0.44	0.93
Wales	0.91	1.28	0.50	18.7	10.0	0.66	0.96
North West	1.10	2.02	-0.26	19.6	11.7	0.53	0.96
Yorkshire	1.33	1.32	-0.22	9.3	9.4	0.46	0.97
Northern	0.67	1.80	-0.16	26.7	11.8	0.52	0.97
Scotland	0.97	0.24	-0.22	4.3	11.5	0.75	1.01
Great Britain	1.06	1.77	0.00	13.6	8.6	0.58	1.00

Table 2.1 Continued

Regional economic data

(b)   1977 Labour Force Survey (data for 1976)

	Employed out-migrants as % of employed stock	Unemployed out-migrants as % of unemployed stock	Net migration as % of labour force	% of out-migrants who are unemployed	Unemployment rate (%) (LFS definition)	Vacancy rate (%)	Relative wage
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
South East	0.98	2.84	-0.12	6.98	2.5	0.56	1.05
South West	1.53	4.50	0.28	7.58	2.6	0.50	0.94
East Anglia	1.65	5.45	0.73	9.09	2.9	0.48	0.95
East Midlands	1.54	3.48	0.29	5.08	2.3	0.42	0.96
West Midlands	1.15	3.51	-0.38	11.11	3.2	0.25	0.97
Wales	1.01	3.45	0.33	10.71	3.3	0.46	0.99
North West	1.05	2.45	-0.15	9.72	4.3	0.37	0.97
Yorkshire	1.00	1.78	0.19	5.77	3.3	0.40	0.97
Northern	0.76	0.79	0.37	4.17	4.0	0.58	1.01
Scotland	0.65	1.69	-0.32	11.11	4.4	0.70	1.01
Great Britain	1.06	2.74	0.00	7.93	3.2	0.49	1.00

Table 2.2

Logit Regressions for the Probability of Migration, 1983-84 (mean of dependent variable = 0.0112)

Independent variable	Sample Mean	Coefficient	(Standard error)
Constant		-4.66	(0.44)**
Age 16-24	0.06	1.01	(0.18)**
Age 25-34	0.25	0.38	(0.12)**
Age 50-64	0.29	-0.88	(0.19)**
Lower qualifications	0.18	0.53	(0.17)**
GCE	0.17	0.77	(0.16)**
Degree	0.15	1.08	(0.17)**
Female HOH	0.10	-0.44	(0.22)**
Single HOH	0.20	-0.22	(0.18)
Working wife	0.46	-0.70	(0.13)**
Dependent child	0.47	-0.49	(0.13)**
Manual HOH	0.49	0.15	(0.13)
Energy	0.04	-1.07	(0.43)**
Manufacturing	0.28	-0.52	(0.23)**
Construction	0.10	-0.59	(0.29)**
Services	0.48	-0.02	(0.22)
Council tenant	0.21	-2.28	(0.32)**
Private rental	0.10	-0.51	(0.17)**
Unemployed HOH	0.09	0.89	(0.22)**
Log regional relative wage	-0.01	-3.73	(0.77)**
Unemployment differential	0.12	0.15	(0.08)*
Cost of unemployment	0.31	-0.42	(0.16)**
Relative vacancy rate	1.00	0.40	(0.32)

Diagnostics

Sample size	33956
- Log L	1870.05
Per cent correct predictions	98.9
Pseudo R^2	0.091

Note: ** significant at 95 per cent level, * significant at 90 per cent level.

Table 2.3

Table 2.3

Alternative Specifications for the probability of migration, 1983-84
(mean of dependent variable = 0.0112)

Independent variable	Model			
	I	II	III	IV
Unemployed HOH	0.88 (0.21)**	0.89 (0.22)**	0.87 (0.22)**	0.82 (0.21)
Log regional relative wage	-2.80 (1.05)**	-3.39 (1.12)**	-3.14 (0.74)**	-2.56 (0.74)**
Relative vacancy rate	0.91 (0.45)**	0.47 (0.45)	0.25 (0.31)	0.55 (0.29)*
Unemployment differential	0.17 (0.08)*	0.16 (0.09)*	-0.07 (0.02)**	——
Cost of unemployment	-0.45 (0.16)**	-0.46 (0.16)**	——	——
Relative house prices	-0.60 (0.50)	——	——	——
Distance	-0.44 (0.32)			
Regional Dummies	No	Yes	No	No
Diagnostics				
$-$ Log L	1868.7	1868.4	1873.4	1877.1
Pseudo R^2	0.091	0.089	0.089	0.088

Note: ** significant at 95 per cent level, * significant at 90 per cent
level. Each regression contains the same variables as in Table 2
in addition to those reported above. Standard errors in parenthses.

Table 2.4

Logit regressions for housing tenure, 1984

	Council		Private	
Constant	−5.81	(0.17)**	−2.07	(0.21)**
Age 16-24	0.65	(0.06)**	1.11	(0.07)**
Age 25-34	0.19	(0.04)**	0.41	(0.04)**
Age 50-64	0.46	(0.04)**	−0.23	(0.05)**
Lower qualifications	−0.68	(0.06)**	0.01	(0.05)
GCE	−1.14	(0.04)**	−0.15	(0.06)**
Degree	−2.41	(0.09)**	−0.22	(0.07)**
Female HOH	0.76	(0.03)**	−0.20	(0.07)**
Single HOH	0.24	(0.04)**	0.82	(0.06)**
Working wife	−0.35	(0.03)**	−0.17	(0.05)**
Dependent child	0.33	(0.03)**	−0.38	(0.05)**
Manual HOH	1.05	(0.04)**	0.27	(0.05)**
Energy	0.29	(0.08)**	−1.48	(0.13)**
Manufacturing	0.53	(0.05)**	−1.63	(0.08)**
Construction	0.58	(0.06)**	−1.40	(0.09)**
Services	0.54	(0.05)**	−0.95	(0.07)**
Proportion Council properties	0.67	(0.02)**		
Proportion Private rentals			0.08	(0.01)**
Unemployed HOH	1.36	(0.06)**	−0.71	(0.08)**

Diagnostics

	Council	Private
Sample size	33956	33956
− Log L	13973.38	9982.65
Mean of dependent variable	0.2132	0.0984
Pseudo R^2	0.2054	0.0841

Note: ** Significant at 95 per cent level. Standard errors in parentheses.

Table 2.5

Migration regressions

	1976-77		1983-84	
Constant	-4.47	(0.44)**	-4.82	(0.56)**
Age 16-24	0.84	(0.23)**	0.72	(0.30)**
Age 25-34	0.58	(0.12)**	0.31	(0.14)**
Age 50-64	-0.64	(0.15)**	-0.84	(0.19)**
Lower qualifications	0.01	(0.14)	0.58	(0.19)**
GCE	0.32	(0.15)**	0.84	(0.20)**
Degree	0.53	(0.18)**	1.13	(0.24)**
Female HOH	-0.33	(0.19)*	-0.41	(0.24)*
Single HOH	-0.40	(0.23)*	-0.38	(0.26)
Working wife	-0.62	(0.11)**	-0.65	(0.13)**
Dependent child	-0.27	(0.12)**	-0.49	(0.14)**
Manual HOH	-0.61	(0.15)**	0.08	(0.16)
Energy	0.26	(0.44)	-0.84	(0.53)
Manufacturing	0.77	(0.35)**	-0.31	(0.39)
Construction	0.44	(0.36)	-0.42	(0.41)
Services	0.65	(0.28)**	0.09	(0.32)
Council tenant	-1.10	(0.65)*	-1.03	(0.71)
Private rental	3.32	(1.21)**	0.98	(1.51)
Unemployed HOH	1.50	(0.26)**	0.83	(0.30)**
Log regional relative wage	-2.85	(0.79)**	-4.06	(0.78)**
Unemployment differential	0.06	(0.62)	0.16	(0.08)**
Cost of unemployment	-0.14	(1.06)	-0.42	(0.16)**
Relative vacancy rate	-0.57	(0.21)**	0.29	(0.33)

Diagnostics

Sample size	53888	33956
- Log L	2939.32	1915.18
Mean of dependent variable	1.0111	1.0112
Pseudo R^2	0.086	0.069

Note: ** Significant at 95 per cent level , * significant at 90 per cent level. Standard errors in parentheses.

Table 2.6

Migration regressions including unemployment interactions

	1976-77		1983-84	
Unemployed HOH	1.77	(0.82)**	1.89	(1.10)*
Log regional relative wage	-2.70	(0.81)**	-4.22	(0.81)**
Unemployment differential	-0.06	(0.64)	0.15	(0.09)*
Cost of unemployment	0.10	(1.12)	-0.40	(0.17)**
Relative vacancy rate	-0.48	(0.24)**	0.46	(0.36)
Unemployed*Relative Wage	-4.07	(4.26)	2.72	(4.39)
Unemployed*Unemp. Differential	0.71	(2.14)	-0.06	(0.73)
Unemployed*Cost of Unemployment	-1.52	(3.70)	0.09	(1.34)
Unemployed*Relative Vacancies	-0.36	(0.81)	-0.98	(0.91)

Diagnostics

- Log L	2937.89	1914.97
Pseudo R^2	0.084	0.068

Note: ** Significant at 5 per cent level, * significant at 90 per cent level. Each regression contains the same variables as in Table 2.5 in addition to those reported above.

Table 2.7

Median predicted probabilities of migration (%)

	Manual		Non-manual		Professional	
	1976-77	1983-84	1976-77	1983-84	1976-77	1983-84
(1) Standard case[a]	1.22	0.61	3.72	1.52	2.00	2.46
(2) But employed	0.44	0.40	1.11	0.87		
(3) Aged 25-34	2.31	0.81	6.67	1.99	4.03	3.39
(4) With working wife	0.69	0.34	2.16	0.86	1.02	1.29
Region						
(5) with $w_i/w = 1.05$	1.05	0.51	3.29	1.02	1.76	1.65
(6) with $u_i-u = 0.05$	1.20	0.54	3.62	1.29	1.94	2.08
(7) with $v_i/v = 1.5$	1.00	0.70	3.03	1.75	1.62	2.83

Notes: a The standard cases are households whose heads have the following characteristics.

Manual: Age 34-49, married male, with no educational qualifications, manual worker in manufacturing industry but now unemployed. Dependent children and wife not working.

Non-manual: As above, except occupation non-manual and with some (lower) education qualifications.

Professional: Age 34-49, married male, with university degree or equivalent, employed as non-manual worker in a service industry, with dependent children and wife not working.

Chapter 3: On-the-Job Search : Some Empirical Evidence from Britain

3.1 Introduction

During the preceding chapter, we established that a worsening of aggregate conditions appeared to discourage inter-regional mobility. A necessary precondition for economically motivated mobility is that the worker must undertake some form of search in order to locate alternative employment. The next two chapters examine the determinants of that search process and the response of job search to economic signals. Chapter 4 concerns the unemployed. Here we concentrate on job search by those currently in employment.

Even in times of economic recession like the early 1980s, in Britain as elsewhere, voluntary job quitting comprises the majority of labour turnover. The Labour Force Survey (LFS) indicates that in the period 1983-84, 75 per cent of all job separations were accounted for by voluntary movements. Job-to-job changes account for around two thirds of all job quits (the other components being retirements, withdrawals from the labour force and quitting into unemployment). About half of all new hirings are of workers with jobs (see Jackman et al, (1989), for some UK evidence). The dominance of job-to-job flows lends itself to detailed empirical study. In Chapter 6 we describe the pattern of these movements in Britain. Here we study the necessary pre-requisite to inter-firm mobility, namely the idea that the worker must undertake some form of on-the-job search. The data we examine sheds light on the kind of workers who are more likely to search on the job than to either not search or quit into unemployment. We then proceed to examine the type of search methods undertaken by these employed job seekers. We show

that firm and household characteristics, local labour market conditions and wages influence both the decision to search and the choice of job strategy.

Despite the importance of job-to-job changes, both theoretical and applied work on job search has concentrated on the search decision of the unemployed. Tobin (1972) was among the first economists to criticise this emphasis in the literature. Commenting on the lack of evidence to support the contention that search whilst unemployed was more efficient than when employed, Tobin noted that the mean duration of US unemployment would be halved were all employment accessions drawn from the unemployed. Since then, several studies have analysed labour turnover without unemployment i.e. job-to-job changes and the necessary precedent of on-the-job search. Parsons (1973) combines a theoretical consideration of on versus off the job search with an empirical study of manufacturing industry quit rates in the United States. Indeed the empirical results on turnover are based upon the assumption that workers quit only when an alternative job is located. The studies on which Parson's assumption is based are also cited, together with several others, by Matilla (1974) to reinforce his contention that around 50 to 60 per cent of all turnover involves no unemployment. Matilla suggests that such behaviour is likely to occur if the expected costs of unemployed search exceed the extra return that more intensive full-time search may bring.

Barron and McCafferty (1977) introduce a formal model of employee job search in which the reservation wage, level of search intensity and labour supply are simultaneously determined by utility maximizing workers. The underlying rationale behind the theory is that increasing search intensity eventually crowds out labour supply and hence employed

job search. Here search costs are measured by foregone wages. In practice workers do not generally forgo wages when undertaking search on the job. Search costs are therefore more likely to be incured in the pursuit of job vacancies. Burdett (1978) offers an alternative explanation for the existence of on-the-job search. If the cost of employed relative to unemployed search is not too high then the strategy with the highest expected payoff is to adopt two reservation wages, X and Y, with X<Y. Jobs with associated wage offers less than X are rejected, jobs with wages above Y are accepted with no further search taking place and wage offers between X and Y are accepted with search continuing on the job. In a similar manner, Hey and McKenna (1979) develop a model in which the cost of moving, not the cost of search, drives a wedge between the market wage and that needed to prevent search on the job. Both the models of Burdett and Barron and McCafferty view employee search behaviour as comprising part of an optimal search strategy. Wilde (1979) notes that this need not be the sole reason for on the job search, if we relax the assumption that wage offers fully characterise a job. In this case i.e. there exist non-wage considerations, then on-the-job search may be initiated by jobs offering different rates of human capital accumulation (see Rosen, 1972). Wilde's preferred explanation is that certain non-wage characteristics may only be observed on the job. If these aspects eventually reveal themselves to be unsatisfactory than search by workers for alternative employment ensues.

The need for empirical verification of the determinants of on-the-job search is clear. Few empirical studies exist, certainly for the United Kingdom. Black (1981) reports regressions for on-the-job search in the US similar to those we present below. Hughes and McCormick

(1985b), emphasise the influence of fixed moving costs (in particular occupational pensions) in a test of the Hey and McKenna (1979) version of on-the-job search and mobility, using a small micro-dataset taken from the 1973 and 1974 General Household Surveys (GHS), in the only other UK study of which we are aware. The dependent variable in the GHS asks whether the individual has "seriously considered" changing jobs, a not entirely satisfactory definition of on-the-job search. Use of the LFS enables us to measure search activity more precisely.

Kahn and Low (1982) have compared the expected wage outcome of unemployed and employed search, and estimated that on average, the reservation wage of unemployed job seekers was 10 per cent above that of on-the-job seekers. Kahn and Low (1984) follow the Barron and McCafferty (1977) model, assuming employed search involves less search intensity, when estimating an ordered probit model of the determinants of on and off the job search.[2] Holzer (1987) presents data which support Barron and McCafferty's assumptions.

Once a decision to undertake on-the-job search has been made, then a subsequent decision as to the choice of search strategy is made by the employed job seeker. Barron and Gilley (1981) distinguish between three possible types of unemployed job search in their analysis of the returns to search. The employed are able to utilise, or have access to, similar search methods and outlets as their unemployed counterparts (though their respective positions may differ with regard to informational flows from particular srategies). It seems reasonable therefore to model job search strategies of the employed in an analagous fashion. The choice of strategy, based upon individual optimisation criteria, determines the rate of arrival of job offers and hence the likely flow into alternative employment. Chapter 4 provides an analysis of the type of job search

methods used by unemployed workers in Britain. This chapter employs the same concepts in the study of on-the-job search. We therefore proceed to estimate a multinominal logistic regression of the preferred search strategy, conditional on the decision to seek work whilst employed, and highlight the important determinants.

In the next section we discuss briefly the theoretical framework and list the likely influences on the job search decision of employed workers. In section 3.3 we discuss the data used in this study and in Section 3.4 we discuss the results. Section 3.5 provides concluding comments.

3.2 Theoretical Framework

An employed worker may decide to look for a new job either if that worker is dissatisfied with the current job or the job is expected to end soon. Having decided to look for a new job, a decision is then made whether to quit the current job to search whilst unemployed, or whether to search on the job. Thus, the probability that a worker is observed searching on the job is the product of the probabilities of search and the decision not to quit into unemployment, given search takes place.

Consider first the latter decision. If the costs of search on and off the job are not too different from each other, a worker quits into unemployment if unemployment income and leisure accumulated over the expected duration of unemployment exceed the wage rate net of the disutility of work, accumulated over the same period. Since in practice wages exceed unemployment income, an employed worker quits only if the nonpecuniary characteristics of the job held are sufficiently bad to induce the surrendering of the income advantage from on-the-job

search.[3]

From this condition we conclude that once a decision to search has been made, on-the-job search is more likely than quitting into unemployment if:

1. The ratio of wages to unemployment benefit is higher.

2. The expected duration of job search is longer.

3. The worker has had a longer tenure on the job.

The first effect follows immediately from the condition that quitting takes place when the nonpecuniary disadvantages of the job outweigh the income advantages. The higher the income advantage, the less likely are the nonpecuniary disadvantages to outweigh it.

The second effect follows from the property of diminishing marginal utility of wealth, which becomes particularly acute when there are liquidity constraints. If the expected duration of search is lengthy and the worker quits, then assets will be reduced by more than if the expected duration of search is short. At the margin this increases the monetary cost of quitting. As assets are run down the unemployed become liquidity-constrained, making the cost of more income loss higher. Full-time, i.e. unemployed, job search becomes less attractive when the opportunities for alternative employment are more scarce. Workers may prefer the security of work combined with less intensive search.

Once a decision to search has been made, job tenure influences quitting through the information that the worker has about the job. Nonpecuniary job characteristics are usually 'experience' goods – the worker discovers them only after the job is taken. Workers with short tenures are unlikely to have learned all the nonpecuniary characteristics of the job. They may still discover many adverse aspects to the job such that it will induce them to quit. In contrast, workers

with long tenures are not likely to find the nonpecuniary characteristics unbearable if they decide to look for a new job. Such workers are more likely to stay on the job until a new offer arrives (Wilde, 1979).

Consider next the probability that a worker decides to search, regardless of whether search takes place on or off the job. Since job search is costly, a worker decides to search only if there is a sufficiently high probability expects that a better job will be found than the one currently held. The probability of locating a job offer depends on how many job vacancies there are, so job search is more likely when the number of vacancies is higher. Job search is also more likely when the worker expects to find a job that is sufficiently better to compensate for the cost of movement. From this we conclude that job search is more likely when:

1. The worker's wage is low relative to that of others with similar characteristics.

2. The cost of movement is low.

3. Job tenure is short.

The first effect is related to the potential monetary rewards from search and job change and it is self-explanatory. The second effect is also self-explanatory. Often job change involves movement to a different location. Workers who are less mobile because of family or other commitments to a given location are less likely to want a job change. Lengthy job tenure could discourage job search because of various seniority rights that the worker may accumulate on the job, for example a non-transferable pension, promotion to a rank that is not easily available to an outsider in a new firm and so on. These effects introduce a fixed cost into the decision to search. The longer job

tenure, the greater the sunk costs and the less likely job search can locate a preferential job offer. Job tenure also discourages search for the reason we discussed in connection with the choice between on- and off-the-job search. A worker who has spent a long time at the same job is likely to have developed a certain degree of affinity with the work and it's environment. In addition, the worker should have acquired job-specific human capital which is not transferable (see Jovanovic (1979b)). In contrast, employees new to a job might still not be fully aware of the job's attributes. The more unpleasant the non-wage characteristics of the job, the greater the likelihood of search for alternative employment.

Table 3.1 summarises the effects that we have discussed so far. A high own wage makes a desire to change jobs less likely. But if the worker decides to search for another job, it is more likely to take place on the job. So the effect of own wage on the unconditional probability of on-the-job search is ambiguous. However, the negative effect on the overall probability of search is almost certain to dominate, with a consequent negative effect on both on- and off-the-job search.

The same ambiguity on the unconditional probability of on-the-job search arises when we consider the effects of job vacancies, non-wage characteristics and job tenure. Vacancies influence the probability of search through their effect on job availability. Quitting into unemployment is more likely when there are more vacancies because the expected duration of search is less. We might still expect an increase in the number of vacancies to lead to an increase in the unconditional probability of on-the-job search, because of the increase in the overall search probability.

Adverse non-wage job attributes encourage unconditional job search, but they may also encourage quitting into full-time search, should they be sufficiently unpleasant to offset the income effect of on-the-job search. Job tenure has a similar effect. Workers with shorter tenures are more likely to search both on- and off-the-job than similar workers with longer tenures. The link between on-the-job search and job tenure may be weakened by the fact that workers with short tenures may decide to quit into unemployment when looking for a new job.

Wages elsewhere have unambiguous effects on on-the-job search. An increase in wages elsewhere, given own wage, increases the probability of search with no apparent effect on the choice between on-the-job search and quitting into unemployment. The personal cost of moving jobs also has an unambiguous negative effect on search on the job.

The probability of job search is also likely to be affected by whether the job is regarded by the holder to be permanent or not. Those in temporary jobs are more likely to search, in anticipation of the termination of the job. Those in part-time jobs may also search more frequently on the job. If part-time jobs are not regarded as permanent career choices by many of their holders, they are likely to have a higher turnover rate than full-time jobs. Even for a given turnover rate, the holder of a part-time job is more likely to have the time to search on the job than the holder of a full-time job. So search on the job should be more common among holders of both temporary and part-time jobs.

Consider now the decision as to how to look for alternative work once the decision to search has been made. Following Barron and Gilley (1981), we can identify three main types of search strategy - random, indirect and self-directed search. Indirect search implies the use of

state or private employment agencies to make contact with jobs. Random search, most closely resembling the type of search behaviour envisaged in early theoretical models, involves direct contact with potential employers. Indirect search implies use by the job seeker of state or private employment agencies to make contact with vacancies. A self directed search strategy encounters job offers through newspaper advertisements or the help of friends and personal contacts. An employed job seeker will choose that strategy, or combination of strategies, to maximise the probability of receiving an acceptable wage offer. Since this probability is the product of the probabilities that a job offer is received and then deemed acceptable, the optimum strategy need not necessarily be the one that yields the most employer contacts. Seater (1979) has demonstrated that diminishing returns to random job search will hold for unemployed job seekers. As the time spent on search increases, so the number of job offers elicited rises, but at a diminishing rate. It seems reasonable to suppose that this will also hold for employed job seekers. Further, on-the-job seekers can only devote a finite amount of time to search when combined with their commitment to work. Random search is perhaps the most time consuming search strategy, though it can elicit the most job offers (Barron and Gilley (1981)). Hence we might expect the characteristics of the worker's current job to influence the search strategy. Temporary or part-time working for example might enable greater opportunity to engage in random search.

Local economic conditions should also affect the type of search strategy used. Employed workers should not invest their time in relatively expensive random search when the supply of vacancies and hence the probability of receiving an offer, is low, or the level of

unemployment is high. A rise in unemployment creates more competition from full-time job seekers who are able to employ random search more efficiently. We would therefore expect the employed job seeker to adopt an alternative principal search strategy.

Each search strategy embodies differential amounts of search intensity. Pissarides (1979) ventures the idea that workers will vary their choice of strategy, and hence level of search intensity, in response to changing market conditions. Job matching is an increasing function of the number of vacancies and workers associated with each search method. We explicitly examine the response of strategy choice to differential local economic conditions in section 3.4.

3.3 Data and Empirical Specification

The data used in this study are drawn from the 1984 Labour Force Survey, an annual cross-sectional survey of around 60,000 households in the United Kingdom. The sample consists of 54,132 persons (31,383 males, 22,749 females) employed during the reference week of the survey in the Spring of 1984.

The regression equation for on-the-job search takes the form

$$P_i = f[X_i, \text{Tenure}_i, Z_i, \text{NPC}_i] + e_i$$

where P is the probability that an individual i is engaged in on-the-job search, X_i is a vector of independent variables that describes the respondent's personal characteristics, Tenure_i is a set of categorical dummy variables representing specific tenure intervals, Z_i is a vector of characteristics describing local labour market conditions including our wage variables, NPC_i is our proxy for non-penuniary wage characteristics of the job and e_i is a logistically distributed error term. Kahn and Low (1984) suggest that those variables contained in the X_i vector characterise the likely wage offer distribution facing a job seeker. More educated workers, for example, may command high alternative wage offers which could induce job search. The absence of direct information on earnings in the Labour Force Survey requires us to proxy aspects of the current wage distribution. To this end we utilise LFS information regarding an employee's region, occupation and industry to obtain two wage variables. Firstly we include the occupational wage (detailed definitions and sources are given in the Data Appendix) which we use to capture the effect of own wages. Workers from high earning occupations are on average more likely to be searching on the job,

because by quitting into unemployment they forgo more income. Secondly, we include mean industrial earnings because many workers who change jobs also change industrial group. Industries with lower relative earnings are likely to lose workers, unless of course these relativities reflect compensating differentials.[4] Workers in industries with high average earnings are less likely to be searching for another job than workers in industries with low average earnings. Thus, in a regression that has both average occupational earnings and average industrial earnings we should expect to estimate a positive coefficient on the former and a negative one on the latter.

Apart from earnings, we use three other variables reflecting economic conditions, regional occupational unemployment and vacancy rates and industrial redundancy rates. Workers from occupations with high vacancy rates are generally more likely to search but they are also more likely to quit to search off-the-job. So vacancies should have a positive effect on search on the job, though not necessarily a strong one. High unemployment is likely to discourage search by employed workers but once again its effect on search on the job may not be strong because immediate quitting by job searchers is discouraged. A high incidence of industrial layoffs should encourage unconditional job search behaviour if the worker perceives his/her job to be in danger. If, as required by law, an impending redundancy is accompanied by sufficient advance notice,[5] then the worker is free to engage in on-the-job search. We measure the non-pecuniary aspects of the job by the appropriate industrial accident rate, a method also used by Viscusi (1979). We would expect workers in hazardous industries to be less satisfied with their jobs, compensating wage differentials notwithstanding.

Interestingly, Hughes and McCormick (1985b) employ a measure of worker satisfaction as a simultaneous proxy for pecuniary and non-wage aspects of the job. The higher the level of worker satisfaction, the more utility is attached to the current job and the less likely search will take place. We do not attempt to replicate this method, prefering instead to try and isolate the separate effects contained within that single measure.

The LFS enables us to measure the degree of on-the-job search quite accurately. Our dependent variable is dichotomous taking the value one if the respondent states that he or she is actively looking for another job to replace the current one and the value zero otherwise. On average 5.3 per cent of respondents in our sample answered yes to the question as to whether they were looking for another job. This average is remarkably close to the one reported by Black (1981) for US males covered by the Michigan Panel Study of Income Dynamics. This contrasts with a figure of 11 per cent estimated by Hughes and McCormick using GHS data and an alternative definition of on-the-job search, albeit at a different level of aggregate unemployment.[6]

Our second principal equation, measuring the determinants of preferred strategy, is by definition estimated across the sub-sample of 2153 on-the-job seekers by multinominal logistic maximum likelihood. Hence the probability that worker i prefers search strategy j is given by:

$$P_{ij} = \frac{\exp\ [X_{ij}\beta + Z_{ij}\gamma]}{\sum\limits_{k=1}^{3} \exp\ [X_{ik}\beta + Z_{ik}\gamma]} \qquad \begin{array}{l} i = 1,\ 2\ \ldots\ N \\[6pt] j = 1,\ 2,\ 3 \end{array}$$

where X_i is a vector of personal characteristics and Z_i a vector of

variables measuring local economic conditions facing the individual concerned. The dependent variable takes one of three values according to whether the worker's preferred method of search is random, self-directed or indirect.[7]

3.4.   Results

3.4.1 Summary Search statistics

Our empirical analysis begins with Table 3.2 and some summary job search statistics from our sample. On-the-job search is extremely low in full-time jobs with long tenures. This is true for both men and women in manual and non-manual jobs. Job search is greater in short tenure jobs, with non-manual jobs having the highest rate. There are no important differences between men and women in average search rates. The higher incidence of on-the-job search in non-manual jobs is presumably due to the higher rates of pay in these occupations and to lower rates of quitting into unemployment.

Search by workers in part-time jobs exhibits some interesting patterns. For men, the rates of search are much higher than in full-time jobs, indicating that men do not, as a rule, regard these jobs as permanent. In contrast, female search activity is lower in part-time jobs than in full-time jobs. However, not much should be made of this difference in behaviour as our regression analysis shows having controlled for personal characteristics, women in part-time jobs are more likely to search than similar women in full-time jobs.

Rates of job search by workers in temporary jobs are high, especially for men. If anything, the surprising thing is that they are

not higher than our results suggest. The idea that most of those in temporary jobs are mainly workers who take a job to continue search on the job is not borne out by the data.

In the last row of Table 3.2 we present the number of unemployed job seekers as a percentage of total employment. In all cases except for men in non-manual jobs there are many more unemployed job seekers than employed job seekers. Since on average about as many new hires are made from employment as from unemployment (Jackman et. al. (1989)), employed job seekers must have much shorter search durations. Most of the difference in durations is probably due to individual heterogeneity – employed job seekers are more employable than unemployed ones – though duration dependence may also play a role as it is likely to affect unemployed job seekers more than employed ones. The long term unemployed will depreciate their human capital more quickly than any long term employed job searcher. We leave this issue to further research and focus our analysis here solely on the employed.

Table 3.3 outlines the types of search methods used by employed job seekers, disaggregated by various demographic groups. The average on-the-job searcher uses around three search methods, evidence that job search is quite extensive. There are no significant differences between men and women in the number or type of search methods used. The most common strategy for an employed job seeker is self-directed search. Over 97 per cent of workers make contact with jobs by placing or answering advertisements in newspapers, or with the help of personal contacts. Around 45 per cent of the sample pursue either indirect or random search. These search strategies are not mutually exclusive. The average on-the-job seeker combines at least two different strategies. This is perhaps unsurprising given the nature of on-the-job search.

Chirinko (1982) provides evidence of diminishing returns to time spent pursuing random search for unemployed job seekers. Random search is a time consuming process, especially if conducted in person rather than through the media. Just 9.8 per cent of our sample chose random search as their main strategy. In contrast, directed search methods are less time consuming and more efficient, given that they are more readily integrated into a normal working routine. Both Chirinko, and Barron and Gilley show that directed search methods produce fewer job contacts for the unemployed than random search. The fact that these measures also appear to be preferred by employed job seekers may imply that concentration of search effort leads to fewer but more acceptable job offers. The most common form of search is to combine self-directed with either random or indirect strategies.

Manual workers (column 4) demonstrate a preference for using personal contacts within self-directed search at the expense of vacancy persual in newspapers. This indicates that workers identify the more likely vacancy sources during the course of search. Manual workers prefer government over private job agencies probably for the same reasons. This is reflected in a higher incidence of indirect search, although this effect is not robust to the introduction of controls for other personal characteristics (see Table 3.7). Columns 5 and 6 suggest that part-time workers do not use more of their leisure to pursue random search but that temporary workers are more willing to approach potential, alternative employers. Those temporary workers who do search (a minority of the sub-sample as we have seen in Table 3.2), do so more extensively than other workers. Not only are temporary workers more likely to pursue indirect or random search, they also utilise more search methods in the process. The imminent termination of a job would

appear to induce greater search effort.   We analyse the choice of strategy more formally in the regression results of Section 3.4.3.

3.4.2 Determinents of On-the-Job Search

Table 3.4 reports the results of our logistic estimation of the likelihood of on-the-job search.   The data indicates that we should present separate results for men and women (Likelihood Ratio Statistic on a male-female sample split =196.0 ~ $\chi^2(23)$). The determinants of on-the-job search differ across the sexes. This probably reflects the division into primary and secondary employment.

Beginning with the variables indicative of local economic conditions, we see that the six estimated coefficients are of the expected sign but only two of them are strongly significant.   The industrial wage has a strong negative effect.   Workers in low-wage industries are more likely to search on the job than other workers, because the opportunity exists to improve earnings by finding alternative employment in a high wage industry.   The coefficient on the industrial wage may be lower than otherwise since not all workers perceive the chance of changing industry.   For example, choice of industry may be limited in the area where workers live. Another reason may be that a low industrial wage encourages more search overall, including quitting to search whilst unemployed.   Unemployed search in low-wage industries may be more important than in high-wage industries.

In Table 3.5, we show that the inclusion of occupational dummy variables to control for differences in the skills mix across industries reinforces the effect of industry wage on search for men.   Thus it seems likely that this observed effect is a genuine response by workers to inter-industry wage differentials.

The occupational wage performs more strongly in the female than male equation. Women in high wage occupations are more likely to search on the job. This may be a response to both to higher expected wage offers and the higher expected probability of receiving a job offer in a more active labour market. Higher wages probably reduce the likelihood of quitting into search unemployment. If we include a single dummy variable to capture the effect of manual workers, the coefficient is negative and significant in the male regression. Search by manual workers, if it takes place at all, occurs off the job. This probably reflects the increased likelihood of redundancy for manual workers.[8]

The effect of our industrial injury rate variable is also strong and significant in the male regression of Table 3.4. Men working in industries with a high accident rate are significantly less likely to be found searching on the job than other workers. We argued earlier that the injury rate will proxy the non-pecuniary characteristics of the job. Since a large incidence of accidents is indicative of unpleasant or dangerous working conditions, workers in such industries may be expected to search more. The implication of the negative coefficient is that these workers quit and search off the job. This result complements that of Viscusi (1979), who finds a significant positive coefficient for a similar variable in the quit *intentions* of US workers. The significance of this variable also supports the idea that workers have imperfect ex-ante information about jobs. Certain non-pecuniary attributes can only be learned by experience on the job. If these characteristics are revealed to be sufficiently unattractive, the worker quits into search unemployment.

The effect of variables capturing local labour market demand is mixed. The unemployment rate is negative and significant (at the 90 per

cent level) in the male equation. The hypothesised fall in job search caused by the reduction in opportunities that high unemployment engenders, offsets any tendency to substitute on-the-job for full-time unemployed search. Vacancies however do not appear to exert any independent influence on the likelihood of on-the-job search. As we argued in previous sections these variables measure a combination of two effects working in opposite directions, so a negligible response is not too surprising. Redundancy rates do have a weak positive inducement to male, but not female, employed job search. Workers in industries with high layoff rates not only engage in more search, presumably as a response to the increased likelihood of losing employment, but do so whilst employed. The effect becomes significant when we introduce occupational dummies (Table 3.5). Women appear to base their job search decisions on factors unconnected with the condition of local labour demand. The introduction of industry dummies does not significantly affect the specification of the equations.[9]

Of the demographic variables, we found that workers over 50 are less likely to search for a new job. Older workers are more likely to have engaged in previous job shopping and found a lifetime job. They are less likely to embark on a new career in a new firm because of their shorter working horizon. Single men behave very much like married men, but single women are more likely to be looking for a new job than married women. This effect is probably due to the fewer family commitments that single women have, making them more mobile than married women and enabling them to assume a primary employment role. Although for men, family ties may be less important in the pursuit of a career, the similarity in the behaviour of married and single men is a little surprising.

Education exerts a strong positive influence on search on-the-job for men and women. A similar effect is also observed by Black (1981) for US males. This is probably caused by the higher earnings that are associated with more education, making voluntary unemployment relatively expensive. More highly educated individuals may also be in occupations where on-the-job search is actually easier than off-the-job search, as for example in the professions where informational vacancy flows are readily at hand. Highly educated workers are also more likely to be human capital investors and thus more ready to search for jobs offering preferential rates of human capital accumulation. More educated workers can expect to elicit a higher wage offer from search.

Tenants in council housing, who are known on average to be less mobile than others like them in private housing (see Hughes and McCormick, 1984) are more likely to be found searching on the job than others. A similar coefficient can be found in Hughes and McCormick (1985b) for UK heads of household. A plausible reason for this result is that council tenants are tied to a travel to work area by their housing. Search for alternative jobs is therefore limited to their immediate vicinity. Hence they are less likely to quit jobs and search for alternative emplyment elsewhere than other more mobile members of the community. In addition, council tenants are typically poorer than the rest of the community and in 1984 the typical tenant suffered much higher unemployment than others. Those tenants who voluntarily decide to change jobs avoid joining unemployment by searching on the job. Thus council housing, rather than being a cause of search, stands more likely for a package of characteristics that discourage voluntary quitting in a depressed market.

Employed men and women who recently moved into the region are less

likely to be looking for a new job. Male employees are more settled into their new jobs after a recent long distance move than others, when account is taken of all other likely influences on job search. In contrast, workers (both male and female) who were unemployed or employed in a different firm one year earlier are more likely to be wanting a change of job. These results are related to the effect of job tenure discussed in Section 3.2, which we also find here to be the most important influence on the likelihood of job search. The presence of these variables partially controls for heterogeneity (i.e. mover-stayer) biases embedded in our measure of tenure. Workers with a high propensity to move are more likely to search on the job at low tenures. The inclusion of a prior mobility term ensures that we do not attribute too strong a tenure effect to on-the-job search. Tenure up to two years still has the strongest effect on search, after controlling for this heterogeneity. Tenure in excess of ten years has the largest dampening effect on job search. These results support our earlier contention that job satisfaction evolves over time. The ensuing effect on job search is eventually reflected in tenure statistics. The results are also consistent with the idea that growth of firm-specific capital reduces the potential gain from job search (Jovanovic, 1979b).

The effect of short job tenure on search is stronger even than the effect of part-time or temporary work. We have already shown (Table 3.2) that only a minority of those in part-time or temporary work are actively seeking alternative employment. Yet those who do search form a more significant grouping than amongst full-time workers, men more so than women. Hence the low mean search values observed in Table 3.2 are the result of the characteristics of those found in these jobs and not the relative attractiveness of part-time or temporary work. For males

in particular, such jobs are inferior to full time employment and so encourage search. The number of male employees found in this type of work is small. Just 1 per cent of our sample of men is in part-time work whereas as many as 42 per cent of the women are in part-time work. It seems unlikely therefore that many unemployed men obtain part-time work as a prelude to further search.

Table 3.6 summarises the results of Table 3.4 by a series of predicted probabilities of on-the-job search for workers with particular combinations of characteristics— these are outlined in a note at the foot of Table 3.6. Row 1 gives the probabilities for a typical worker, which is around 6 per cent for men and 4 per cent for women. Row 2 shows that were the same worker to have a part-time job, then the likelihood of on the job search would triple for men and rise by around a one half percentage point for women. This emphasises the contrast between men and women in their perceptions regarding the status of part-time working. Similarly there is some divergence in the job search behaviour of men and women engaged in temporary work (row 6). Both groups are more likely to be searching for alternative employment than similar workers in permanent jobs and men twice as much as women. Row 3 indicates that single, female workers are more likely to look for a new job, though the effect for men is negligible. Rows 4 and 5 demonstrate the effect of differing job tenure on inducing search. Male workers with under six months tenure are four times as likely to look for a new job than similar workers with over ten years tenure. A similar differential also exists for women. Long job tenures are indicative of a successful job match and as such generate little search activity.

Rows 7 to 10 show the result of varying local economic conditions on employee job search. The magnitude of the effect is never large. Men

respond more strongly to an increase in the local unemployment rate to 15 per cent, reducing the likelihood of on-the-job search by around one percentage point. An increase in the accident rate to 2.5 per thousand workers generates a 2 per cent percentage point fall in on the job search activity. A 10 per cent rise in the occupational wage rate generates no perceptible search response, though as we have already suggested this may be because an increased likelihood of on-the-job search is offset by a fall in the unconditional probability of search activity. A 10 per cent increase in the industrial wage differential reduces search probabilities marginally since it lowers the attractiveness of alternative jobs in other industries. The implication for our estimation is that a large relative wage disparity is required to induce the observed job search behaviour.

Finally rows 11 and 12 present predicted probabilities for two differing types of workers, who differ in their propensities to engage in on-the-job search than the average employee. The more mobile and educated members of the workforce living in a buoyant labour market have a predicted probability of on-the-job search of over 30 per cent. For older workers with long job tenure in a depressed regional labour market, the search probability falls to around one half of one per cent. Job search by these individuals is hardly contemplated.

3.4.3 Determinents of Job Search Strategy

Table 3.7 presents our estimates of the determinants of the preferred search strategy of those workers who decide to seek alternative employment whilst still employed. The data again implies that the sample be split by sex (likelihood ratio statistic on a male-female sample split = 52.8 ~ $\chi^2(22)$). Thus although Table 3.3

indicates similar choices of search strategies by males and females, there exist large discrepancies in the determinants of that choice between the sexes.

The duration of job search, for example, is a significant indicator of the type of strategy undertaken by male, but not female, employed job seekers. Men are more likely to prefer random search in the initial stages of their search. A similar pattern is observed for women but this is insignificant. This observation is consistent with the hypothesis of diminishing returns to (random) search. It may be that workers contact their percieved best job outlets directly, during the first months of job search. If these efforts subsequently prove unsuccessful then job seekers will adopt alternative strategies in the hope of generating acceptable job offers. Random search is expensive both in monetary terms and in time expended. As workers run down their resources, so the preference for this strategy declines. This effect is also reflected in the negative search duration coefficients observed for indirect and self-directed search.

The preferred search strategy for men and to a lesser extent for women engaged in part-time or temporary work, is indirect search i.e. registration with a government or private employment agency. Thus our earlier argument that part-time workers have more time to pursue random search does not translate directly into an observed preference for this type of search. Many temporary workers will be attached to an employment agency. It is unsurprising therefore that these workers perceive their best chance of receiving an acceptable offer is with an agency. A similar argument may apply to part-time working, although it is somewhat surprising that part-time workers do not prefer self-directed search through personal contacts and newspapers wherein

many part-time jobs are advertised. However since over 90 per cent of job seekers undertake some form of self-directed search our results merely suggest that self-directed strategies have a secondary role in the job search activities of non full-time workers.

Local economic conditions also influence the choice of search strategy, though not always in the hypothesised direction. We find a strong (male) occupational wage effect. The higher the wage the less likely the preference for random search and the more likely indirect or self-directed search. This probably reflects the differing vacancy notification outlets across occupations. Low-wage jobs are most likely to be contacted via random approaches to employers. It is reasonably common in tight labour markets to see unskilled vacancies notified at factory gates and in shop windows. High vacancy rates are associated with less random search and increased preferences for indirect search amongst employed men.[10] One might expect that more vacancies and competition for workers amongst firms would encourage firms to advertise through agencies or in newspapers. In practice job seekers appear to concentrate their search efforts in response to a rise in labour demand, choosing to search within pre-defined areas afforded by indirect or self-directed search. In this way job search efforts are made to respond more efficiently and effectively to increased vacancy supply. Table 3.4 indicates that employed job search may be reduced by a rise in unemployment. Table 3.7 suggests that of those workers who continue to search, preferences move away from random and self-directed strategies toward indirect search, particularly for women. Random search is unlikely to generate many job offers when there is increased competition for jobs. Indirect search is the most secure method of contacting such vacancies as do exist in a slack labour market.

Table 3.8 reports predicted search strategy probabilities for selected groups of workers. The typical worker chosen to illustrate the likelihood of on-the-job search in Table 3.6 is seen to prefer random to indirect search, if male, and the reverse if female (row 1). Self-directed search dominates the preferred categories of all our groups. Extensive search duration halves the likelihood of men adopting a random strategy, consistent with the notion of decreasing returns to this approach (row 3). This is complemented by row 4, which shows that with a 15 per cent unemployment rate, workers consolidate their position in bad times by concentrating search effort on job agencies. Workers with larger potential gains from search (high wage and vacancy rates), also move away from random search (rows 5 and 6). The individual magnitude of these economic effects is not great. Large movements in these indicators would be required to induce a perceptible change in worker behaviour. If we combine these variables with changes in base characteristics, we can obtain an insight into the type of workers more prone to a particular strategy. Young single workers for example, are far more likely to prefer indirect search. This probably reflects their lack of knowledge of the labour market. Young workers (row 7) will not have developed the informational flows and contacts that are associated with age and experience. In contrast (row 8), older employees accumulate sufficient information that enables them to express a preference for random search even in a depressed local economy.

3.5: Conclusions

On-the-job search is an important activity for study since job-to-job changes account for most of labour turnover. Job search, as a prelude to future mobility, is a necessary means by which to try to improve the qualities of a job match, both pecuniary and non-pecuniary. This chapter has attempted to provide empirical confirmation of the theoretical determinants of on-the-job search for men and women in Great Britain and of the types of methods of search subsequently undertaken. Our regressions indicate that job search is responsive to varying economic conditions. Inter-industry wage differentials and tight labour market conditions are positively correlated with on-the-job search. The latter also influence a worker's preferred means of locating job offers.

The strongest influences on the likelihood of search are however job characteristics. Men and women with long job tenures are much less likely to search on the job. The acquisition of firm-specific capital reduces the potential gain from search. Workers engaged in temporary jobs are more likely to search than those in permanent employment. Yet these job seekers are a minority of those with temporary jobs. The remainder presumably wait until the termination of their job before resuming search. Part-time working also elicits greater job search efforts. Workers react to adverse non-wage aspects of the job by reducing employed job search, presumably moving into full-time unemployed search.

Once a decision to seek alternative work has been made, the employed job searcher then chooses the preferred methods with which to contact job offers. The most commonly chosen form of on-the-job search is to

combine a self-directed strategy with either indirect or random search. Self-directed search strategies are more readily integrated into a normal working routine than the more time consuming random search. Hence employed workers increase search efficiency by concentrating search efforts within a pre-determined area defined by indirect or self-directed search. Temporary workers search more extensively than others in anticipation of a pending job termination. A worker's choice of search strategy is heavily influenced by the duration of search and the strength of local labour market activity. Lengthy search durations and slack labour markets encourage movements away from random search and into self-directed or indirect search. The concentration of search activity increases the likelihood of contacting an acceptable job offer.

Footnotes

* This study has been financed by the Department of Employment.

1. The two studies referred to are the Bureau of Labor Statistics Surveys of 1955 and 1961 in which all those employees who quit jobs within the survey year were asked whether they moved directly into new jobs.

2. The model therefore carries the unrealistic assumption that workers can freely adjust their labour supply in accordance with the optimal search outcome.

3. It may be of course that unemployed search allows a greater search intensity and hence a greater probability of receiving a job offer which may offset the income disadvantage. However since search intensity is itself a function of time and income, even if unemployed workers are observed to search more intensely, the advantage of off-the-job search does not follow immediately.

4. This of course assumes that there exist inter-industry wage differentials for given occupations and not merely because of the different occupational mix across industries. See Dickens and Katz (1987) for evidence from the United States in favour of this hypothesis.

5. Current UK regulations as embodied by the Employment Protection Act 1975 require at least 30 days advance notification of any redundancy, and 90 days notice if the planned layoff incorporates over 100 workers.

6. See chapter 6 for some evidence that inter-firm mobility is pro-cyclical. It therefore follows that on-the-job search will also follow the same pattern.

7. The LFS asks job seekers whether they have used any of 8 possible

search methods, as outlined in Table 3.2. Respondents are then asked to identify their main method of search, from which we obtain our dependent variable.

8. The presence of the manual status dummy reduces the significance of the economic variables rather like the full set of occupational dummies in Table 3.5. Hence its exclusion in the final specification. The negative manual worker effect can be seen in the wage, vacancy and unemployment coefficients in Table 3.4.

9. Not one of the 5 occupational and 9 industrial dummies proved individually significant. This contrasts with Hughes and McCormick (1985b), who report significant negative coefficients on the search intentions of professional and skilled manual workers, although these estimates are regression specific.

10. We exclude a manual status dummy in the final specification for the same reasons as discussed in footnote 8. The inclusion produced a significant negative coefficient on indirect search in the male regression and no other strong effects elsewhere.

Appendix A3

Data Sources

Information on individual socio-economic characteristics is taken from the 1984 Labour Force Survey as provided to us by the UK Office of Population Census and Survey and the ESRC Data Archive. We include individuals classed as employed on the LFS definition (Males aged 15-64 years and females aged 15-59). An employed job seeker is defined to be one who, during the reference week of the survey, has looked for a new job to replace the existing one. The LFS derived variables are:

AGE1624 = 1 if respondent aged 16-24; = 0 otherwise

AGE5064 = 1 if respondent aged 50-54; 0 otherwise

SINGLE = 1 if single, divorced or widowed; 0 otherwise

DEGREE = 1 if highest qualification is degree or membership of
   professional institute; 0 otherwise.

GCE = 1 if highest qualification is GCE 'A' or 'O' level or equivalent;
   0 otherwise

OTHER = 1 if highest qualification is of technical or vocational nature;
   0 otherwise

COUNCIL = 1 if living in local authority housing; 0 otherwise

MOVE = 1 if moved region in year preceding interview; 0 otherwise

DIFFIRM = 1 if employment by different firm one year prior to interview;
   0 otherwise

UNEMP = 1 if unemployed one year prior to interview; 0 otherwise

INACTIVE = 1 if outside the labour force one year prior to interview;
   0 otherwise

TEMPORARY = 1 if current job is temporary or of fixed contract length;

    0 otherwise

SMALL = 1 if current establishment contains less then 25 employees;

    0 otherwise

PTIME = 1 if respondent reports current job to be part-time; 0 otherwise

TENLT6M = 1 if current job tenure 6 months or less; 0 otherwise

TEN624M = 1 if current tenure between 6 and 24 months; 0 otherwise

TEN210Y = 1 if current tenure between 2 and 10 years; 0 otherwise

LOOKLT3M = if duration of job search 3 months or less; 0 otherwise

LOOK36M = 1 if duration between 3 and 6 months; 0 otherwise

LOOK612M= 1 if job search duration between 6 and 12 months; 0 otherwise

In addition we have supplemented the LFS dataset with information relating to the first quarter of 1984 from the following sources.

1. Unemployment

UOCCRATE - Log of regional male and female unemployment rate disaggregated by occupation. Source: 1984 Labour Force Survey.

2. Vacancies

VOCCRATE = Regional vacancies expressed as a percentage of employees in employment disaggregated by occupation. Source: Department of Employment *Gazette*, Table 3.6.

3. Employment

All employees in employment disaggregated by region. Source: Central Statistical Office *Regional Trends*, Table 8.1.

4. Wages

OCCWAGE/INDWAGE = Log of average hourly earnings of men and women disaggregated by region and a) occupation, b) industry. Source: Department of Employment *New Earnings Survey* (1984), Part E, Tables 118-121, 122-123.

5. *Redundancies*

REDRATE = Number of redundancies confirmed to the Department of Employment under the Employment Protection Act 1975 by industry. Source: Department of Employment *Gazette*, Table 2.31.

6. *Accident Rate*

ACCRATE = Fatal and Major injuries per 1000 employees, reported to authorities by 2 digit SIC. Source: Health and Safety Executive *Health and Safety Statistics*, 1984-85, Table 2.1A.

Table 3.1

Properties of on-the-job Search

Variable	Probability of search	Conditional probability of on-the-job search	Unconditional probability of on-the-job search
Own wage	−	+	? (−)*
Wages elsewhere	+	0	+
Job vacancies	+	−	? (+)
Adverse Non-Wage Characteristics	+	−	? (−)
Job tenure	−	+	? (−)
Mobility Cost	−	0	−

Note: * The bracketed sign indicates the likely direction of the effect.

Table 3.2

% Employees engaged in job search

Type of Job	TOTAL		MANUAL		NON-MANUAL	
	Men	Women	Men	Women	Men	Women
1. Full-time, Tenure > 20 years	1.69	1.52	1.32	0.97	2.16	1.75
2. Full-time, Tenure < 20 years	6.58	6.36	6.43	5.61	7.95	7.24
3. Part-time	15.88	4.65	25.67	5.44	13.61	4.36
4. Temporary	33.96	16.59	34.92	14.70	32.12	17.92
Total Employed Job Seekers	5.08	5.51	5.05	5.39	5.11	5.56
Unemployed Job Seekers (as % of Employment)	13.20	12.21	19.97*	14.71*	4.81*	11.01*

Note: * The Labour Force Survey gives the previous occupation of those who lost their job within the previous three years only. For the remaining unemployed we used the weights in the occupational classification of unemployment, for the most recent year for which there is aggregate information, 1982.

Table 3.3

Search Methods and Strategies of On-the-Job Searchers

Percentage Using Search strategy/method	Status					
	Total	Male	Female	Manual	Temp.	Part-time
	1	2	3	4	5	6
Self Directed	97.5	97.9	97.0	97.2	98.5	97.6
Advertising in newspapers	1.7	1.8	1.6	1.8	1.7	1.6
Answering advertisements	52.9	52.6	53.2	43.9	56.5	50.4
Studying situations vacant in newspapers	50.5	51.0	49.8	56.5	46.4	54.2
Personal contacts (friends, colleagues, trade unions)	57.2	59.6	54.1	66.5	67.6	61.7
Indirect	45.7	43.8	48.1	49.5	60.8	57.3
Visiting Job Centre, Govt. Employment Office etc.	36.6	34.5	39.4	45.4	51.2	53.5
Private Agency	13.5	13.3	13.9	7.2	16.6	8.8
Random Direct approaches to firms/ employers	47.4	47.2	47.6	47.5	56.5	44.0
Other	47.5	48.1	46.8	39.7	46.9	39.4
Mean number of Search Strategies	2.47	2.49	2.43	2.42	2.41	2.24
Mean number of Search Methods	3.07	3.08	3.06	3.07	3.43	3.14
Sample Size	2,291	1,303	988	1,080	416	548

Table 3.4

Logit Regressions for the Probability of Search on the Job

(a) Males aged 15-64

Independent Variable	Sample Mean	Estimate	Standard Error
Constant		0.30	(1.17)
AGE5064	0.24	-0.81	(0.10)**
SINGLE	0.27	-0.02	(0.06)
EDUCATION: DEGREE	0.15	0.86	(0.10)**
: GCE	0.34	0.43	(0.07)**
: OTHER	0.08	0.23	(0.10)**
COUNCIL	0.20	0.12	(0.07)*
MOVE	0.03	-0.24	(0.15)
Situation 1 year ago			
: DIFFIRM	0.07	0.15	(0.11)
: UNEMPLOYED	0.04	0.47	(0.12)**
: INACTIVE	0.02	-0.04	(0.14)
Current Job Attributes			
: TEMPORARY	0.03	1.31	(0.10)**
: SMALL	0.30	-0.08	(0.06)
: PART-TIME	0.01	1.23	(0.13)**
: TEN LT6M	0.06	1.36	(0.14)**
: TEN 624M	0.13	1.44	(0.10)**
: TEN 210Y	0.38	1.11	(0.08)**
Local Economic Conditions			
: UOCCRATE	-2.73	-0.14	(0.08)*
: VOCCRATE	0.56	-0.07	(0.11)
: OCCWAGE	6.02	-0.16	(0.24)
: INDWAGE	6.03	-0.63	(0.19)**
: REDRATE	0.20	0.24	(0.17)
: ACCRATE	0.80	-0.22	(0.04)**

Diagnostics

Log L	-5,697.47
Model L.R. Statistic (d.f.)	1,380.26 (22)
Per Cent Correct Predictions	94.8
Mean of Dependent Variable	0.052
Sample Size	31,303

Note: ** significant at 95 per cent level, * significant at 90 per cent level 2-tailed t test.

Table 3.4 (ctd)

(b) Females aged 15-59

Independent Variable	Sample Mean	Estimate	Standard Error
Constant		-3.36	(1.32)**
AGE5064	0.19	-1.00	(0.14)**
SINGLE	0.32	0.60	(0.07)**
EDUCATION: DEGREE	0.10	0.68	(0.12)**
: GCE	0.36	0.50	(0.08)**
: OTHER	0.11	0.49	(0.10)**
COUNCIL	0.21	0.10	(0.08)
MOVE	0.02	-0.08	(0.17)
Situation 1 year ago			
: DIFFIRM	0.08	0.24	(0.12)**
: UNEMPLOYED	0.03	0.54	(0.14)**
: INACTIVE	0.09	-0.09	(0.12)
Current Job Attributes			
: TEMPORARY	0.06	0.89	(0.09)**
: SMALL	0.43	-0.09	(0.06)
: PART-TIME	0.42	0.19	(0.09)**
: TEN LT6M	0.10	1.23	(0.17)**
: TEN 624M	0.20	1.27	(0.14)**
: TEN 210Y	0.47	1.04	(0.13)**
Local Economic Conditions			
: UOCCRATE	-2.80	-0.07	(0.11)
: VOCCRATE	0.62	0.10	(0.12)
: OCCWAGE	5.61	0.37	(0.23)
: INDWAGE	5.59	-0.63	(0.22)**
: REDRATE	0.11	-0.29	(0.28)
: ACCRATE	0.45	0.01	(0.09)

Diagnostics
Log L	-4,500.47
Model L.R. Statistic (d.f.)	750.69 (22)
Per Cent Correct Predictions	94.5
Mean of Dependent Variable	0.055
Sample Size	22,749

Note: ** significant at 95 per cent level, * significant at 90 per cent
level 2-tailed t test.

Table 3.5

Specification Tests on the Probability of Search on the Job

Independent Variables	Estimates		
a) *Males*			
UOCCRATE	-0.12 (0.12)	-0.13 (0.08)	-0.12 (0.12)
VOCCRATE	-0.09 (0.16)	-0.13 (0.12)	-0.07 (0.16)
OCCWAGE	0.63 (0.52)	-0.34 (0.24)	0.66 (0.57)
INDWAGE	-1.31 (0.28)**	-0.48 (0.23)**	-1.39 (0.39)**
REDRATE	0.44 (0.18)**	0.77 (0.45)*	0.79 (0.45)*
ACCRATE	-0.20 (0.04)**	-0.19 (0.09)**	-0.18 (0.09)*
Occupation Dummies	Yes	No	Yes
Industry Dummies	No	Yes	Yes
Log L	-5,688.9	-5,680.4	5,672.3
Model L.R. Statistic (d.f.)	1,397.4 (27)	1,414.3 (31)	1,430.6 (36)
Per Cent Correct Predictions	94.8	94.8	94.8
b) *Females*			
UOCCRATE	-0.16 (0.12)	-0.07 (0.11)	-0.17 (0.12)
VOCCRATE	-0.13 (0.19)	0.09 (0.12)	-0.11 (0.19)
OCCWAGE	0.76 (0.28)**	0.27 (0.25)	0.65 (0.29)**
INDWAGE	-0.56 (0.25)**	-0.44 (0.28)	-0.12 (0.36)
REDRATE	-0.26 (0.30)	0.12 (0.73)	0.40 (0.75)
ACCRATE	-0.01 (0.09)	-0.04 (0.17)	-0.11 (0.29)**
Occupation Dummies	Yes	No	Yes
Industry Dummies	No	Yes	Yes
Log L	-4,496.2	-4,497.5	-4,491.4
Model L.R. Statistic (d.f.)	759.3 (27)	756.6 (31)	768.8 (36)
Per Cent Correct Predictions	94.5	94.5	94.5

Note: All equations include the same variables as reported in Table
3.4 in addition to those above.

Table 3.6

Predicted Probabilities of on the job search for given characteristics

		Predicted Probability	
		Men	Women
1)	Base characteristics	0.0659	0.0402
2)	As 1) except PTIME=1	0.1945	0.0482
3)	As 1) except SINGLE=1	0.0647	0.0709
4)	As 1) except TENLT6M=1	0.0831	0.0482
5)	As 1) except tenure ≥ 10 years	0.0227	0.0146
6)	As 1) except TEMPORARY=1, TEN624M=1	0.2668	0.1137
7)	As 1) except UOCCRATE = 15%	0.0590	0.0380
8)	As 1) except 10% increase in OCCWAGE	0.0649	0.0416
9)	As 1) except 10% increase in INDWAGE	0.0621	0.0378
10)	As 1) except ACCRATE = 2.50	0.0430	0.0410
11)	As 1) except AGE5064=1, no formal qualifactions, tenure in excess of 10 years, living in high unemployment, vacancy region	0.0058	0.0030
12)	As 1) except SINGLE=1, DIFFIRM=1, TENLTGM=1, living in high vacancy, low unemployment region, low industry wage	0.3421	0.309

Note: Base characteristics define worker aged 16-49, Married, Education
= GCE, living in owner-occupied accommodation. Employed full-time
by same large firm for between 2 to 10 years. Local economic
variables assume mean values.

Table 3.7

Multinominal Estimates of the Preferred Job Search Strategy

Independent Variable	Strategy					
	Indirect		Random		Self-Directed	
	Male	Female	Male	Female	Male	Female
Constant	-5.27 (3.27)	-3.59 (3.41)	6.28 (4.21)	-4.97 (4.23)	0 (normalised)	0
AGE1624	0.43** (0.16)	0.02 (0.14)	-0.12 (0.18)	-0.03 (0.21)	-0.33	0.01
MANUAL	-0.53** (0.24)	-0.15 (0.13)	-0.06 (0.14)	0.13 (0.16)	-0.07	0.02
TEMPORARY	0.36** (0.14)	0.15 (0.17)	-0.02 (0.17)	0.13 (0.21)	-0.34	-0.28
PTIME	0.27 (0.18)	0.23 (0.18)	-0.10 (0.24)	-0.09 (0.22)	-0.20	-0.14
LOOKLT3M	-0.22 (0.15)	0.10 (0.17)	0.51** (0.17)	0.28 (0.21)	-0.26	-0.38
LOOK36M	-0.34* (0.18)	0.24 (0.21)	0.50** (0.20)	0.04 (0.26)	-0.13	-0.28
LOOK612M	-0.32* (0.17)	0.08 (0.21)	0.50** (0.19)	-0.10 (0.28)	-0.18	0.02
VOCCRATE	0.34* (0.21)	0.02 (0.25)	-0.61** (0.27)	-0.14 (0.32)	0.17	0.12
UOCCRATE	0.32* (0.18)	0.54** (0.25)	0.19 (0.18)	-0.35 (0.29)	-0.30	-0.19
OCCWAGE	0.83* (0.43)	0.35 (0.46)	-1.00** (0.51)	0.01 (0.53)	0.17	-0.36

Diagnostics	Males		Females	
	At Zero	At Convergence	At Zero	At Convergence
Log L	-1347	-921.6	-1018	707.2
Degrees of Freedom	2452	2438	1854	1812
Per Cent Correctly Predicted	33.3	71.2	33.3	70.0
Sample Size	1226		927	

Notes: ** indicates significant at 95 per cent level, * significant at 90 per cent level 2-tailed t test. Normalisation constraint requires sum of coefficients across the 3 states equals zero. Equation also contains dummy variables measuring Age, Education, Marital Status, Children, Housing Tenure and Job Tenure. Sample shares of dependent variable were: (.70, Self-directed, .18 Indirect, .12 Random) for males and (.69, .21 and .10) for females respectively.

Table 3.8

Predicted Probabilities of Prefered Search Strategy

| | Predicted Probability | | | |
| | Men | | Women | |
	Indirect	Random	Indirect	Random
1) Base characteristics	0.094	0.159	0.113	0.051
2) As 1) except PTIME=1	0.145	0.164	0.154	0.052
3) As 1) except LOOK ≥ 1 year	0.103	0.080	0.073	0.049
4) As 1) except UOCCRATE = 15%	0.118	0.162	0.199	0.040
5) As 1) except 10% increase in OCCWAGE	0.102	0.144	0.121	0.052
6) As 1) except 10% increase in VOCCRATE	0.098	0.149	0.112	0.050
7) As 1) except SINGLE=1, DCHILD=0, TENLT6M=1, AGE1624=1,living in high wage, high vacancy, low unemployment region.	0.289	0.102	0.364	0.070
8) As 1) except AGE5064=1,DCHILD=0, LOOK612M=1, OTHER=1, tenure in excess of ten years, living in low wage, low vacancy, high unemployment region.	0.103	0.221	0.268	0.011

Note: Base characteristics define worker aged 20–49, Married, Education = GCE, living in owner-occupied accommodation. Employed full-time by same large firm for between 2 to 10 years. Local economic variables assume mean values. In addition we now assume job search has currently lasted for less than 3 months. The probability of observing self-directed search is one minus the sum of the probabilities of indirect and random search.

Chapter 4: Unemployment Benefits and Search Effort in the UK Labour Market

4.1 Introduction

We now turn our attention to the determinants of job search by the unemployed. In particular, this chapter examines the role of unemployment benefits as an aid to job search, and an enhancement to a more efficient working of the labour market. If labour is to become more mobile, it must be able to adapt more readily to periods of unemployment. The provision of unemployment related benefit should facilitate job search effort, if recipients use this additional income to subsidise job search rather than leisure. Indeed these principles were incorporated into the world's first national system of compulsory unemployment insurance scheme introduced in Britain in 1911.

Yet from the inception of the scheme under the National Insurance Act of 1911, the idea that the unemployed should receive income support whilst out of work has attracted some criticism. Much of this criticsim concerns the issue of whether unemployment benefits encourage workers to remain unemployed longer than otherwise. In theory any system should guard against this. The setting of benefit at a level sufficiently below that attainable from employment was incorporated into the original UK scheme. The payment of benefit was also limited to three months in any one year, though as demand conditions worsened this time period was gradually extended. Income receipt was made conditional on the worker being available for work and confined to those who had been involuntarily separated from their jobs. The current administrative system retains many of these original features. It is now possible

however, for unemployed workers to obtain some form of government assistance indefinitely provided the worker is deemed to have satisfied a series of conditional requirements primarily relating to work availability and alternative income sources. (See Matthewman and Sloss (1988) for an outline of the current benefit administration system in the UK).[1]

These social security regulations inevitably mean that some workers qualify for financial support whilst others do not. Government unemployment statistics are calculated on the basis of those claiming unemployment benefit. Yet not everyone out of work and looking for a job is entitled to receive benefits — those who left their previous employment voluntarily and people with insufficient National Insurance contributions are two notable examples.[2] The Labour Force Survey (LFS) provides an alternative definition of unemployment based upon principles outlined by the International Labour Organisation. This definition refers to persons available for work, who have actively sought work within a specified period. The LFS unemplyment statistics therefore include persons within and without the government's administrative definition. Indeed this survey based measure of unemployment should be largely unaffected by changes in legislation and regulation.

More importantly for our purpose, the LFS provides a sound empirical base from which to analyse whether benefit payments induce a change in a worker's job search behaviour. Comparison of the search activities of recipients and non-recipients should help assess the validity of the disincentive argument. This chapter analyses differences in job search effort between these two groups.

Empirical estimates of the relationship between unemployment rates and benefits in the UK, followed the introduction of redundancy payments

in 1965 and Earnings Related Supplement in the National Insurance Act of 1966. Gujarati (1972) was one of the first to present results indicating that the UV curve had shifted outward at around the same time. This he attributed to increased worker choosiness arising from the increase in unemployment benefits enshrined in the 1966 Act. Maki and Spindler (1975), in their study of the same phenomena ventured, but did not pursue, the idea that increases in unemployment benefit would be an inducement to greater search activity. Of course such ideas cannot be addressed without access to micro data.

An established finding of the job search literature is that the probability of gaining employment is the product of the probabilities of (a) receiving a job offer and (b) the acceptability of any such offer. Theoretical and empirical analysis of the role of unemployment benefits in the job search process has concentrated upon the latter — the reservation wage criterion. Mortensen (1970, 1977) was among the first to demonstrate that the provision of unemployment benefits would reduce both the cost of search and the expected gain from future employment. The resulting increase in worker choosiness raises the reservation wage and hence the duration of unemployment. Hitherto, the majority of U.K. empirical studies using micro data have examined this duration effect. A number of authors from Nickell (1979) and Lancaster (1979) through to Narandranathan (1989) all rely on the reservation wage hypothesis to explain their estimated elasticities of duration with respect to benefits, taking no account of the potential for unemployment benefit to influence the probability of receiving a job offer.

The rate of arrival of job offers will be dependent on the level of demand in the particular labour market in which the individual is searching. It must also be dependent on the level of effort with which

individuals search the market. This paper attempts to establish an empirical link between unemployment benefits and search effort using U.K. micro data. The direction of such an effect will have important implications for the study of unemployment duration. If the receipt of unemployment benefits induces individuals to search harder (so increasing the probability of receiving a job offer) this will then limit the reservation wage effect of benefits on unemployment duration. Conversely, the reservation wage effect could be accentuated should benefit claimants reduce their search effort.

In the next section we discuss briefly the theoretical framework. This includes an outline of a potential selectivity problem which arises from the nature of our dataset. Since we only observe economically active claimants and non-claimants, we may be open to some form of heterogeneity bias were we not to control for behavioural differences between those included in our sample and those excluded because they do not belong to the labour force according to LFS guidelines. The appropriate sample selection correction technique is therefore based around search theoretic considerations of the decision to participate in the labour market. In Section 4.3 we discuss the data used in this study and in Section 4.4 we present results, which indicate that benefit claimants search more extensively than non-claimants. Section 4.5 provides concluding comments.

4.2 Theoretical Framework

Those 'unemployed actively seeking work' who are not eligible to receive unemployment related benefits consist mainly of new labour force entrants, re-entrants, people who left their previous job voluntarily. There are reasons to believe that the job search behaviour of these individuals will differ systematically from that of benefit claimants, even after accounting for any observed heterogeneity.

The probability that an unemployed worker will obtain employment is the product of the probability, q, that the worker will receive a job offer and the probability w that the offer will be deemed acceptable.

$$P_e = qw$$

Most empirical studies have established, if with little agreement as to the magnitude of the effect, that $dw/db < 0$.[3] An increase in unemployment benefit reduces both the cost of further search and the expected gain from employment so rendering fewer job offers acceptable. This paper is primarily concerned with the potential for unemployment benefits to influence the likelihood of receiving a job offer.

We therefore endogenise the job offer probability, q, which therefore becomes a function both of the level of demand, z and the degree of search activity undertaken by job seekers, s.

$$q = q(z,s) \qquad \frac{dq}{dz}, \frac{dq}{ds} > 0$$

Search effort generates information about alternative job offers. It includes activities such as the use of state or private employment agencies, direct approaches to firms or the placing of advertisements in

newspapers and journals. The more effort expounded the larger the amount of information accrued and the higher the probability of contacting a job offer. The first attempt to justify empirically the claim that unemployment benefit could influence the degree of search activity appears in Barron and Mellow (1979) using US data. Here search effort is given by

$$S = S(e,t,x)$$

where e and t represent the expenditure and time respectively devoted to search activity per period and x represents the influence of personal characteristics. Unemployed workers derive a utility over the unemployment spell defined in terms of income and leisure

$$U = U(y + b, L)$$

where y is non-labour income, b is unemployment benefits and L is leisure. On undertaking search the utility function becomes

$$U = U[y + b - e, L - t]$$

On the assumption that search time and expenditure, are separable inputs in the search effort function, Barron and Mellow derive expected utility optimization conditions which show that the existence of unemployment benefit will reduce search time but increase expenditure. Empirical evidence is produced to support the first contention. As income rises with the provision of unemployment benefits, so more leisure is purchased at the expense of time spent searching the labour market. The authors use this evidence to support their contention that benefits will reduce the job offer contact probability. In a subsequent paper (Barron and Mellow (1981)), the authors show that the monthly probability of employment accession is lower for benefit receipients.

(See chapter 5 for some UK evidence which does not entirely support this result).

In contrast, Tannery (1983) presents a model in which search time and expenditure are complementary rather than separable inputs into the search effort function, s. In this case the increased expenditure afforded by benefits can be used to enhance the productiveness of time spent on job search. So the overall effect of benefits on search effort may be positive, even though the length of search time may fall. Empirical evidence is presented of a positive coefficient of benefits on search time. This intimates at the sensitivity of Barron and Mellow's results to choice of data. Ben-Harim and Zuckerman (1987) show that such an effect can offset the reservation wage effect and reduce unemployment duration. This is likely to be the case if there exist capital market imperfections and liquidity constraints among the unemployed. Unemployment benefits will then be used to help finance and intensify search effort from limited resources.

The productivity of search effort by benefit claimants will be higher if they use their job contacts more efficiently. The provision of benefits could enable workers to target likely job offer sources more effectively. We might expect to observe a movement away from time intensive search methods. More vacancies can be contacted by telephone or by post than by direct approaches to firms. Information could be more accessible and easily processed by someone who has closer ties with the labour market as benefit claimants may have, compared to new entrants or re-entrants. (The other group who form part of non-claimants, job quitters, will have less incentive to look for work, at least in the initial stages of their unemployment when their marginal value of leisure is still high.)

It would appear therefore, that the sign of the unemployment benefit effect on search effort is a matter for empirical verification.

We examine the benefit impact by contrasting the number of search methods used by benefit claimants and non-claimants. St Louis, Burgess and Kingston (1986) argue that the most apposite measure of search effort is the number of actual job contacts made, since this accurately conveys the intensity with which the inputs of time and expenditure are combined. Given the absence of such information in our dataset we proxy search effort by the extensiveness of job search, a measure which also incorporates the notion that search expenditures and time are combined to produce a search output. The use of such a variable is preferred to that found in Barron and Mellow (1979) namely the reported hours spent searching, which as we have shown captures only one component of search effort.

In the only other UK study of which we are aware, Jackman and Williams (1985) utilised the number of job applications made by members of the DHSS Cohort Study of 1978-79 as an alternative measure of search intensity. In their model, unemployment benefits discourage job applications because they reduce the expected returns from so doing This measure does not however incorporate any notion of search extensity. Workers may make any number of applications using only one particular method of search. Benefit claimants may use their income to target potential vacancies more precisely. The wider the field of search, the more likely a job may be targeted. This would not be apparent from an analysis of job applications that did not control for number of search methods used. A similar argument applies to Barron and Mellow's (1979) examination of search time. Benefit claimants may choose methods that involve less time but offer greater search productivity.

Nevertheless the idea that benefits reduce search effort because workers perceive the expected return from employment has fallen remains a hypothesis worthy of empirical attention.

We therefore model the number of search methods used by unemployed job seekers as a function of the claimant status of the individual, a vector of personal characteristics, and a set of variables intended to measure the impact of local economic conditions. We would expect favourable economic conditions to encourage greater search extensiveness as a response to an increased return from search. This may be mitigated if individuals were to become less concerned about gaining immediate employment in the face of improved job opportunities. This would be akin to the reaction of reservation wages under similar conditions noted by Mortenson (1970). The personal characteristics vector includes controls for observed heterogeneity and differences in search effort attributable to the length of search spell. As the duration of unemployment increases we might expect effort to decline if the worker were to contact his (or her) most favourable options at the outset of the spell (see Holt (1970) for example). The indefinite nature of benefit provision in the United Kingdom, unlike in the United States or Japan, should ensure that claimants can prolong search effort relative to non-claimants. Any observed increases in effort with duration would be more likely to come from non-claimants nearing the exhaustion of finite search resources.

Before proceeding we must first deal with a statistical problem that arises from our analysis of search effort that is necessarily conditional upon an initial decision by the worker to participate in the labour market. Search theory suggests (see for example Pissarides (1976), Burdett and Mortensen (1978)) that participation is dependent on

an evaluation of the relative costs and returns from so doing. The provision of unemployment benefits will encourage participation, for those eligible to receive them, by simultaneously reducing the cost and increasing the return from labour market entrance. In practice this ensures the majority of claimants remain in the labour force. However some claimants do drop out.[4] We therefore involuntarily exclude those claimants whose expected returns from entering the labour market are sufficiently low as to render participation sub-optimal. Similarly the unemployed stock contains only those non-claimants with a sufficiently large expected return from job search to compensate for their higher entry and search costs relative to claimants, 'other things equal.

To counteract this selectivity bias problem we follow the approach outlined in Maddala (1983). We include in our analysis of search effort an additional regressor, calibrated from an initial equation to determine the probability that an individual is actively seeking work. We model this selection equation as a three way likelihood, which allows us to distinguish between those actively seeking work, discouraged workers and the wholly inactive. If, benefit claimants maintain a closer attachment to the labour force we would expect them to posess positive desired hours of work[5] even if the costs and expected returns from search preclude participation. In other words benefit claimants are more likely to be discouraged rather than wholly inactive, relative to non-claimants.

Our model therefore takes the form

$$N_{si} = X_{si}\beta_s + U_{si} \qquad\qquad (S = 1,2,3)$$

$$I^*_{si} = Z_{si}\alpha + \eta_{si} \qquad\qquad (i = 1,2,\ldots N)$$

The subscript i refers to the ith individual, the subscript s refers to

the labour market status of the individual (1 = unemployed, 2 = discouraged, 3 = inactive). We observe N_s, the number of search methods used, if and only if I = 1; where

$$I = 1 \quad \text{iff} \quad I_s^* > \max I_j^* \qquad j \neq s$$

Let $\epsilon_s = \max I_j^* - \eta_s$, then

$$\Pr (\epsilon_1 < Z_1\alpha) = \Pr(I=1) = \frac{\exp (Z_1\alpha)}{\sum\limits_{j=1}^{3} \exp(Z_j\alpha)}$$

$$= F(Z_1\alpha)$$

i.e. we estimate the probability of participation as a trichotomous logit, obtain estimates $\hat{\alpha}$ of the parameters α, transform the error term ϵ_s into a standard normal variable

$$\epsilon_s^* = J(\epsilon_s) = \Phi^{-1} [F(\epsilon_s)]$$

and estimate the equation

$$N = X\beta - \sigma\rho\frac{\varphi(J(Z_1\hat{\alpha}))}{\Phi(J(Z_1\hat{\alpha}))} + v$$

by ordinary least squares, where σ^2=Var(u) and ρ is the correlation coefficient between u and ϵ_s^*. The second term on the right hand side is the selectivity correction variable to control for the sample censoring.

4.3 Data and Estimation

The data used in this study are drawn mainly from the 1984 Labour Force Survey (LFS). The information therein allows us to differentiate between the search activities of those unemployed (according to the LFS definition)[6] who are claiming unemployment related benefit and those not. Our sample contains 7610 individuals unemployed in the spring of 1984.

In our analysis of the particpation decision, the dependent variable takes one of three possible values according to whether the individual is classified as unemployed, discouraged or inactive on LFS definitions. A discouraged worker is so counted if he/she replies that a belief that no jobs were available was the main reason for not searching for work during the survey week. Any other response and the individual is deemed inactive.

Each year the unemployed are asked a number of questions regarding their search activities. As outlined in Section 4.2 we measure search effort by the number of different methods the individual has used to look for work, according to the options given by the LFS questionnaire.[7] Holzer (1987) uses a similar method to ours in his analysis of job search by unemployed youths in the United States. These categories are reproduced in Table 4.1. The LFS does not contain any information regarding the time expended on job search. We have argued that the latter captures only one component of search effort. Furthermore, studies which have access to such information, have documented large measurement error (see Jackman and Williams (1985) for UK evidence). We experiment with the removal of attendance at job centres from the

dependent variable in our search effort regressions. This avoids any potential misinterpretation of our results that could arise were claimants to posess a stronger attachment to job centres owing to the administration of the benefit system in the United Kingdom.[8]

In addition to those variables drawn from the LFS, we have supplemented the data set with data on earnings, unemployment and vacancies. Following Narendranathan *et al* (1983) it seems reasonable to assume that the unemployed will restrict job search to a subsection of the total labour market. This avoids wasting effort contacting jobs with which the individual would not require, or could not acquire a match. We therefore combine our external data with personal information from the LFS to produce unemployment, vacancy and expected wage rates pertinent to the region and broad occupational group in which the individual is assumed to be searching.[9] Our expected wage variable represents the mean wage offer of each particular labour market subsection.

The LFS does not contain information on the amount of unemployment related benefits individuals receive. Instead our regressions incorporate a dummy variable, taking the value one if the individual reports the receipt of any unemployment related benefits and zero otherwise. We cannot therefore make any judgements regarding the amount of benefit the individual receives and its effect on search effort. The other variables we use to explain search effort control for observed heterogeneity in personal and socio-economic characteristics.

Estimation of the participation (selection) equation utilises the choice based maximum likelihood technique developed by Manski and Lerman (1977). The sample is not random, but consists of a disproportionate number of discouraged workers. This is necessary because of the small

number of discouraged workers in our sample and the size restrictions imposed by the computer program used to estimate the selection equation. The likelihood equation is suitably weighted to reflect this. The technique consists of weighting the appropriate component of the likelihood by the ratio Q_i/H_i where Q_i is the true proportion of those choosing option i and H_i is the choice based sample proportion of those choosing i.[10] The resulting estimates presented in Table 4.2 are consistent but the standard errors are inefficient. The sample selection correction technique when applied to models of polychotomous choice is analogous to that in models of binary choice. We present results for men and women separately. This accords with the separate treatment of men and women in the analysis of labour supply.

4.4 Results

Table 4.1 presents summary statistics on the number of methods used by individuals to look for work. The penultimate row shows that the average male or female unemployed benefit claimant uses more search methods than does the non-claimant seeker. Both groups, on average, use more than two methods simultaneously in their search for work. This implies that job search is not a uniform activity. The average for claimants of 3.16 is remarkably close to the mean value of 3.07 search methods used by employed job seekers in Chapter 3. This could suggest that a similar level of search effort is undertaken by on-the-job seekers and the claimant unemployed alike and that this is greater than the effort expounded by non-claimants.

Fewer benefit non-claimants visit job-centres than claimants. This

despite the fact that the receipt of unemployment benefit is no longer contingent on attendance at the job-centre. Whilst we have already alluded to the institutional factors linking the benefit and job centre systems, it could suggest that claimants have a somewhat closer attachment to the labour force. Conversely, it may imply that claimants and non-claimants search in different areas of the labour market. Given that around one third of total vacancies in the economy are notified to job centres and that the majority of those vacancies are manual, non-claimants would be less likely to register if they believed the jobs they desired would not be offered there. A similar argument has been advanced by Holzer (1988) who suggests that individual differences exist in the relative cost and productivity of each available search method. This influences the choice and number of search methods and hence our measure of search effort. Unemployment benefits imply the existence of differing opportunity sets for recipients and non-recipients.

Female non-claimants are more likely to use personal contacts or study situations vacant in newspapers than use job centres. This would support a segmented labour market hypothesis for female claimants and non-claimants. Claimants of both sexes are more likely to use personal contacts or make direct contact to firms, which supports our contention that claimants will have closer ties with the labour market by virtue of more recent experience. Male non-claimants are still more likely to use job centres than any other search method, suggesting they search in similar labour markets to their claimant counterparts. This contrasts with US evidence (see Holzer (1988)) where use of friends and relatives and direct contact with firms are consistently the preferred methods of search. Our results complement those of Jackman and Williams (1985) who produce similar search classifications from the 1978 Cohort Study. It

would indicate that job search is organised differently in the two countries, being more institutionalised within the United Kingdom.

4.4.1 Participation and Benefits

We now consider the econometric evidence on the determinants of search. We begin with an analysis of our selection equation which determines the probability that an individual is observed in our sample of unemployed workers. Table 4.2 presents the results of our selection equation based on the likelihood that an individual is observed in one of three possible non-employed states. The likelihood ratio test for a sample split between male and female is highly significant (LR = 254.0 ~ $\chi^2(40)$). As expected, benefit recipients are more likely to participate in the labour force. More interestingly, they are also more likely to be observed as discouraged workers rather than wholly inactive. Even if the costs and expected returns to job search preclude participation, claimants retain a closer market attachment than non-claimants by maintaining positive desired hours of work. Should conditions improve then this former group will be more likely to re-enter the labour market.

The effect of aggregate conditions is weak and not always of the right sign. Men facing high vacancy rates are more likely to seek work and less likely to be discouraged or wholly inactive. We were unable to identify a strong response toward local economic conditions for women, for whom the participation decision may be more relevant.

The effect of the socio-demographic variables is well documented in the participation literature, see for example Layard, Barton and Zabalza (1980), so we mention their effects only briefly. The young are

primarily actively seeking work or wholly inactive. The incidence of discouragement rises with age as the expected returns from participation fall. Increased human capital in the form of higher education generally ensures a higher return from seeking work and reduces the chances of discouragement. Health problems, unsurprisingly, are associated with a greater incidence of labour force inactivity. Individuals living in households with other unemployed members are more likely to be participants than discouraged or inactive. This added worker effect holds for both men and women. We also find that the presence of employed household members induces job search activity. It may be that any household that maintains close labour market ties, generates a larger flow of information which enhances the expected return from job search. Prior labour market experience helps foster higher expected returns that induce male, but not female job search. Work experience also helps discouraged workers maintain a taste for work, even if job search is not viable. As the time spent out of employment increases, so the likelihood of discouragement or inactivity rises at the expense of job search. Finally we note that those made redundant retain a stronger attachment to the labour force than job quitters.

4.4.2 The Effect of Benefits on Search Effort

We now take the estimated probabilities implicit in Table 4.2 and adjust for any selection bias present in our analysis of the effects of unemployment benefits on search effort. The results are presented in Table 4.3. The Chow Test on the male/female sample split is 3.35 ($\sim F(26,7558)$), against a 95 per cent significance level of 1.50.

Receipt of unemployment benefits exerts a positive and significant

influence on search effort. Benefit claimants search more extensively than non claimants. Our result holds across both sexes and if we remove attendance at a government job centre from the dependent variable (Model 2 rather than Model 1). Movement from Model 1 to 2 reduces the size of the claimant coefficient somewhat, as we lose the correlation between job centres and the benefit administration system. Nevertheless the magnitude of the coefficient, and hence the implications for benefit receipt on search effort, remains strongly positive. Around ninety per cent of male job seekers claim benefits. It is to be expected that they will be primary earners in the household, embodied with a more immediate incentive to find work than any male non claimant who is more likely to be a job quitter or re-entrant. Job quitters have a higher marginal value of leisure. That the result holds for female job seekers,[11] reinforces the view that benefit claimants have closer ties with the labour market. Just over fifty per cent of female job seekers report receipt of unemployment related benefit. The majority of female non claimants will be women who re-enter the labour force following a period of economic inactivity (looking after young children, for example). Not only will they be less familiar with the labour market facing them, but their ineligibility for unemployment benefit may limit their ability to finance search effort. The fact that men search more extensively than women reflects partly the observation that men are more likely to receive benefits.

This result is somewhat at odds with the findings of Jackman and Williams (1985), who estimated a small negative effect of benefits on the number of job applications of unemployed men. However their sample consists entirely of benefit recipients and the benefit variable is measured continuously, so that their results pertain to within-claimant

status differences. Our results contrast the search efforts of claimants and non-claimants. The evidence presented here indicates that the former search more widely which we take to be indicative of a larger degree of expended effort.

Of the effect of economic variables on job search effort, we found some evidence. The wage rate is of the expected sign, i.e. positive, and significant for men but not women. This offers some confirmation that an increase in the expected wage rate will induce greater search effort as workers endeavour to capture higher returns in the labour market. Our intended measures of demand conditions in the job seekers' local labour market are also correctly signed. The significance of the coefficients depends on the model chosen. Removal of job centres from the dependent variable reduces the significance of the vacancy rate and increases that of the unemployment rate. The implications are that a) a rise (fall) in unemployment deters (encourages) job search efforts other than job centre attendance and b) alternative search methods are less responsive to changes in notified vacancy rates.[12] These estimates appear to be robust to the inclusion of regional dummies (see Table 4.4). So individuals increase, rather than relax, search effort in the face of both a rise in the job offer probabilities and a fall in the competition for jobs.

The effect of the demographic variables on search effort is straight forward. Older workers, both male and female, search less than their prime age counterparts. The expected return from search will be lower given their shorter time horizons. Increased education raises the productivity of search effort. This observed effect may also be consistent with the idea that differently qualified individuals search in different labour markets, which in part determines their level of

search effort.

Single men search less than married men. Fewer commitments to the home or family enable single people to value leisure more highly. Consequently their search intensity is reduced. A converse effect is observed for married women. This latter group being more likely to be supported by a working spouse during search. Council house tenants search more extensively than others in private housing. It is established that the former are more prone to unemployment. Perhaps their experience of being out of work more frequently enables them to make better use of the available job help facilities. The presence of other unemployed members in the household generates a discouraged rather than added worker effect for women. The major effect of this variable is therefore to encourage participation, as we have shown in Table 4.2. Once present in the labour market, women under such circumstances do not search any harder. The presence of employed workers in the household is of the expected sign and significant for men. Not only do employed workers provide more information about the labour market to potential job seekers, they also provide an additional source of income with which to finance search effort.

The characteristics of the job held (if any) immediately prior to the current spell of unemployment significantly affect search effort, although the magnitude of effect differs across the sexes. Male manual workers are more likely to search harder whereas there is no discernible effect for their female equivalents. This may indicate a greater desire by male manual workers to escape unemployment. This is supported by the layoff coefficient which is both strong and positive for males and females. Table 4.2 indicates that redundant workers have closer ties with the labour market. There is additional evidence in Table 4.3 of a

higher associated wish to re-enter the work environment. This contrasts with results from the US (Holzer (1987)), which find a negative layoff effect. Individuals laid off in the US have a greater chance of being recalled by their previous employer, which could account for the negative sign. It cannot be attributed to their being more likely to receive benefits, since we have explicitly controlled for such an effect. Men looking for part time work search less extensively but there is no discernible impact for women. Since part time work entails generally lower wages, the returns from search are comparatively smaller. It is also indicative of a lower attachment to the labour force. However, men looking for part-time work form only 2 per cent of the unemployed male work force, compared to 35 per cent of women. That a negligible effect is observed for women, may be attributable to the increased availability of part-time work. A higher likelihood of obtaining part-time work may offset the full-time wage premium so that the expected return from part-time work is greater.

Table 4.3 provides evidence of a duration effect amongst male and female job seekers. Search effort increases during the initial stages of unemployment. Workers spend the first few weeks of their unemployment adjusting to their new status. They may also find a job relatively quickly without the need to search extensively. Thereafter as the unemployment spell lengthens, it may be that workers begin to explore their most promising job opportunities. If they are subsequently unsuccessful, then the productivity of search will decline over time. Skills may atrophy and close ties with the labour market recede as the unemployment spell increases. As they do, so the expected return from search falls and with it search effort.

There is evidence of selectivity bias in the female, but not male,

search effort equations. The omission of the correction term reduces the magnitude of the claimant coefficient to such an extent, that it becomes insignificant in Model 2 of the female regressions (see Table 4.4). The implication is that without allowing for the fact that only those individuals with the highest expected returns from participation are observed actively seeking work, we would not attribute a sufficiently large effect of unemployment benefit on search effort. The selectivity correction term enables the true claimant effect to emerge. That selectivity bias is more important in the female regressions reflects the secondary nature of much female labour force participation, where the decision to enter the labour market is more of a choice variable.

Finally Model 3 examines the validity of our earlier statement that benefit recipients should be a) more responsive to economic signals, by virtue of their closer attachment to the labour market and b) more able to prolong job search, by virtue of the additional income provided by benefits. We do this by interacting the claimant status dummy with the appropriate right hand side variables. Both our hypotheses are confirmed for women but only the latter for men. Female claimants increase search effort by more than non claimants when the expected returns from job search (as measured by a rise in vacancy or wage rates or a fall in unemployment) improve. Male claimants only respond relatively more to variations in the unemployment rate. The majority of male non-claimants are job quitters rather than re-entrants. It would appear they pay similar heed to aggregate informational flows as claimants. Benefits claimants of both sexes do however prolong search effort relative to non claimants. Non claimants search harder during the initial stages of unemployment, when benefits may provide a

temporary leisure subsidy. As unemployment duration lengthens and search activities of both groups fall with the loss of informational contacts and access to the labour market in general, benefit recipients seem able to maintain a higher level of search effort, thereby maintaining a relatively higher probability of receiving a job offer. The net effect[13] of benefit receipt on search effort, taking into account all the interaction terms, remains strongly positive.

If benefits operate in this manner then the consequences for job matching efficiency are twofold. First, the increased search intensity of claimants relative to non-claimants, generates a negative externality for the latter, whose chances of contacting a vacancy are reduced. Secondly, Pissarides (1984) shows that the increased likelihood of a job match generated by increased search effort, creates a positive externality by saving society the search costs of both firm and worker. If, as Pissarides shows, the second externality dominates the first, then the net effect of unemployment benefit on job offer receipt will be beneficial

4.5 Conclusions

Unemployed labour will be more mobile if it is more able to readily locate alternative offers of unemployment. The provision of unemployment benefits facilitates the job matching process and therefore mobility, by enabling unemployed workers to finance their job search activities more readily. Increased search effort raises the probability of contacting a vacancy and hence the expected duration of employment, other things equal. This chapter has shown that non claimants are less attached to

the labour market and that benefits can improve job matching efficiency by improving job search productivity. After controlling for personal characteristics and aggregate economic conditions we find that benefit claimants search more extensively than non-claimants, thereby increasing the rate of job offer arrival. Further, individuals increase, rather than relax, search effort in response to favourable demand conditions. There is no strong evidence of a differential response by claimants and non-claimants to these signals.

That is not to say the probability that workers gain employment is necessarily increased by their claiming benefit. Benefit provision may simultaneously raise the reservation wage. Rather, it should be recognised that unemployment benefits will have two distinct effects on job search – reservation wage and job offer effects – which can work in opposing directions. The results in this paper indicate that studies of unemployment duration should incorporate an explicit allowance of these latter effects when attempting to establish linkages between benefit provision and duration. Only then will it be possible to assess these interactions effectively.

Footnotes

* This study has been financed by the Department of Employment and the Economic and Social Research Council

1   This publication is revised annually to take account of ongoing changes in the social security system.

2   Other groups ineligible for unemployment benefit include those who were dismissed from a job due to misconduct, those who refuse the offer of a suitable alternative job and workers who lose employment whilst directly involved in a trade dispute. Some of these groups may be entitled to other forms of benefit.

3   Narandranathan (1989) estimates a reservation wage elasticity with respect to benefits of 0.23. This compares with a figure of 0.14 given by Lancaster and Chesher (1983) and 0.16 found in Narandranathan and Nickell (1985).

4   The proportion of claimants classified according to LFS definitions as either unemployed, discouraged and inactive were 0.77, 0.08, 0.15 respectively for males and 0.62, 0.06, 0.32 for females. The equivalent figures for non claimants were 0.09, 0.03, 0.88 (males) and 0.09, 0.02 and 0.89 (females).

5   The term "positive desired hours of work" implies that the utility gleaned from working exceeds that obtained from being out of the labour force.

6   The U.K. LFS definition of unemployment requires that the individual is without a paid job and actively seeking work, waiting to start a job, awaiting the results of an application or temporarily sick, during the reference week of the survey. Note that this does not conform to the ILO standard guidelines which require the unemployed

to have looked for work in the past four weeks, and be available to begin work within a fortnight.

7   Since the dependent variable can take values from zero to eight, OLS estimation should be more or less valid. The density function of the dependent variable does not appear particularly skewed or show signs of skewness (see Table 4.3). The Kolmogorov D statistic tests for normality were 0.196 and 0.174 for men (inclusive and exclusive of job centre attendance respectively) and 0.192 and 0.157 for women. None of these values can reject the null hypothesis of normality.

8   Until October 1982, the unemployment count was based upon numbers registering at job centres, rather than the number claiming unemployment benefit. Even allowing for this discontinuity the interaction between government job finding agencies and social security offices is likely to be strong.

9   The LFS only contains information on a workers previous occupation if he/she has been unemployed for less than three years. For those with missing observations we use the average vacancy/wage rate in each region.

10   In our sample the true proportions were 0.42, 0.05, 0.53 for unemployed, discouraged and inactive males, respectively and 0.16, 0.02, 0.82 for women. The choice based sample numbers are given at the foot of Table 4.2.

11 This contrasts with similar work by St. Louis *et al* (1986) who find a significant negative impact of benefits on search effort (as measured by the number of actual job contacts made) for men and an insignificant positive effect for women.

12   Only around one third of total vacancies are notified to job centres. It is therefore unsurprising that certain search methods are unresponsive to notified vacancies.

13 The net effect of benefit equals the coefficient on the claimant status intercept dummy plus the sum of the claimant interaction coefficients multiplied by the respective means of the independent variables concerned.

Appendix A4

Data Sources

Information on individual socio-economic characteristics is taken from the 1984 Labour Force Survey as provided to us by the UK office of Population Census and Survey and the ESRC Data Archive. We include all individuals classed as unemployed on the LFS definition (Males aged 15-64 and females aged 15-59). All LFS based independent variables enter our equations as zero-one dummies.

In addition we have supplemented the LFS dataset with information from the following sources:

1. Vacancies.

   Regional vacancies notified to Job Centres expressed as a percentage of employees in employment - disaggregated by 6 occupational groups. Source: Department of Employment Gazette, Table 3.6.

2. Employment.

   All employees in employment disaggregated by region. Source: Regional Trends (Central Statistical Office), Table 8.1.

3. Wages.

   Average weekly earnings of men and women disaggregated by region, 16 broad occupational groups and full-time/part-time status. Source: Department of Employment New Earnings Survey (1984), Part E, Tables 122-123 and Part F, Table 180.

4. Unemployment.

   Regional unemployment rates disaggregated by 6 occupational groupings. Source: 1984 Labour Force Survey.

Table 4.1

Job Search Method Use by Unemployed Workers

Type of job search method	Benefit Claimant			Non Claimant		
	Total	Male	Female	Total	Male	Female
Visiting a job centre, Government Employment Office, etc.	81.5	82.4	79.4	47.4	59.7	43.6
Name on private agency books.	8.4	7.7	10.2	8.8	8.7	8.8
Advertising in newspapers	2.4	2.4	2.3	2.5	3.3	2.2
Answering advertisements	42.0	42.3	41.1	36.7	29.6	38.9
Studying situations vacant columns in newspapers	53.6	53.7	53.3	54.0	49.9	55.3
Direct approach to firms/ employers	42.6	44.5	37.5	34.4	39.7	32.8
Personal contacts	62.5	65.1	55.8	52.0	55.2	51.2
Other methods	4.6	5.1	3.4	6.2	8.4	5.5
Mean number of search methods used (Standard Deviation)	3.16 (1.44)	3.22 (1.43)	2.98 (1.44)	2.36 (1.53)	2.30 (1.73)	2.39 (1.46)

Note: Sample sizes are 4957 (3520 males and 1387 females) for claimants, and 1608 (415 males and 1193 females) for non-claimants.

Table 4.2

Choice Based Multinomial Estimation of the Status of Non-Working
Individuals

Independent Variable	Unemployed		Discouraged		Inactive	
	Male	Female	Male	Female	Male	Female
Constant	2.29	-2.94	-0.96	1.53	0	0
	(5.31)	(5.17)	(9.46)	(13.89)		
Age: 16-24 years	0.16	0.09	-0.36	-0.61	0.20	0.52
	(0.19)	(0.29)	(0.31)	(0.50)		
: 50-64 years	-1.09**	-0.48*	0.49**	0.22	0.60**	0.26
	(0.14)	(0.27)	(0.21)	(0.39)		
Education: Degree	-0.20	0.29	-0.03	-0.64	0.23	0.35
	(0.30)	(0.54)	(0.45)	(0.94)		
: GCE	0.28*	0.19	-0.31	-0.56	0.03	0.37
	(0.17)	(0.27)	(0.28)	(0.48)		
: Other	0.22	0.36	0.08	-0.39	-0.30	0.03
	(0.22)	(0.34)	(0.33)	(0.60)		
Dependent Children	-0.17	0.13	0.06	-0.49	0.11	0.36
	(0.13)	(0.21)	(0.20)	(0.36)		
Single	-0.23*	0.08	0.13	0.21	0.10	-0.29
	(0.14)	(0.23)	(0.19)	(0.37)		
Council Tenant	-0.15	-0.02	0.18	0.09	-0.03	-0.07
	(0.12)	(0.21)	(0.17)	(0.33)		
Others in household						
: Unemployed	0.46**	0.08	-0.31	0.02	-0.15	0.10
	(0.15)	(0.24)	(0.24)	(0.38)		
: Employed	0.19*	0.29	0.01	-0.15	-0.20	-0.14
	(0.11)	(0.22)	(0.17)	(0.34)		
Worked Before	0.17	-0.40	0.69*	0.44	-0.86	-0.04
	(0.25)	(0.35)	(0.42)	(0.60)		
Previous job						
: left <1 year ago	0.55**	0.53*	-0.96**	-0.11	0.41	-0.42
	(0.22)	(0.29)	(0.34)	(0.50)		
: left 1-3 years ago	0.23	0.24	-0.51*	0.03	0.28	-0.27
	(0.21)	(0.31)	(0.30)	(0.52)		
: Manual	-0.07	0.11	0.20	0.20	-0.13	-0.31
	(0.18)	(0.29)	(0.29)	(0.48)		
: Made redundant	0.42**	0.20	0.35*	0.39	-0.77	-0.59
	(0.15)	(0.30)	(0.23)	(0.49)		
Health Problems	-0.07	-0.07	-0.17	-0.10	0.24	0.17
	(0.11)	(0.20)	(0.16)	(0.32)		
Benefit Claimant	1.34**	1.06**	0.56**	0.44	-1.90	-1.50
	(0.13)	(0.23)	(0.19)	(0.37)		
Local Economic Conditions						
: Vacancy Rate	0.43*	0.02	-0.26	-0.03	-0.17	0.01
	(0.25)	(0.44)	(0.38)	(0.72)		
: Wage Rate	-0.44	0.41	-0.10	-0.86	0.54	0.45
	(0.76)	(1.15)	(1.16)	(1.94)		

Table 4.2 (Contd)

Diagnostics	MALE		FEMALE	
	At Convergence	At Zero	At Convergence	At Zero
Log L	-877.5	-1931	-589.8	-2589
Degrees of Freedom	3472	3512	4670	4710
% correct predictions	82.0	33.0	91.7	33.3.
Sample size	1756		2355	

Notes: i) Standard Errors in parenthesis
ii) Figures in final column obtained from normalisation requirement that the sum of the coefficients for each variable equal zero.
** denotes significance at 95 per cent level,
* denotes significance of 90 per cent level 2 tailed t test.

Table 4.3a (Males)

Estimated Determinants of Job Search Effort

			Model	
Independent Variable	Sample Mean	1	2	3
Constant		-0.20	-0.96	-4.07
		(1.12)	(1.02)	(2.61)
Age: 16-24 years	0.35	0.09	0.04	0.04
		(0.06)	(0.05)	(0.05)
: 50-64 years	0.18	-0.47**	-0.42**	-0.42**
		(0.13)	(0.12)	(0.11)
Education: Degree	0.04	0.23**	0.32**	0.32**
		(0.11)	(0.10)	(0.10)
: GCE	0.23	0.42**	0.39**	0.39**
		(0.06)	(0.05)	(0.05)
: Other	0.11	0.37**	0.34**	0.34**
		(0.07)	(0.07)	(0.07)
Single	0.50	-0.12**	-0.13**	-0.13**
		(0.06)	(0.06)	(0.06)
Dependent Children	0.45	-0.06	-0.06	-0.07
		(0.05)	(0.05)	(0.05)
Council Tenant	0.51	0.15**	0.10**	0.10**
		(0.05)	(0.04)	(0.04)
Presence of others in household				
: Unemployed	0.22	0.04	0.01	0.01
		(0.06)	(0.05)	(0.06)
: Employed	0.45	0.09*	0.08**	0.08**
		(0.05)	(0.04)	(0.04)
Health Problems	0.31	-0.11**	-0.08*	-0.08*
		(0.05)	(0.04)	(0.04)
Moved to seek work	0.04	0.19*	0.25**	0.25**
		(0.10)	(0.09)	(0.09)
Worked Before	0.90	0.22**	0.20**	0.21**
		(0.10)	(0.09)	(0.09)
Previous job				
: Manual	0.53	0.14**	0.16**	0.16**
		(0.07)	(0.06)	(0.06)
: Manufacturing	0.22	0.01	-0.01	-0.01
		(0.05)	(0.05)	(0.05)
: Made Redundant	0.45	0.20**	0.17**	0.17**
		(0.07)	(0.06)	(0.06)
Duration Seeking Work				
: 3 to 12 months	0.28	0.06	0.05	0.15
		(0.06)	(0.06)	(0.17)
: 12 to 24 months	0.17	0.03	-0.01	0.21
		(0.07)	(0.07)	(0.21)
: 24 months +	0.38	-0.23**	-0.24**	-0.45**
		(0.07)	(0.07)	(0.15)

Table 4.3a (contd)

Independent Variable	Sample mean	Model 1	Model 2	Model 3
Looking for Part–Time Work	0.01	-0.53** (0.18)	-0.56** (0.16)	-0.55** (0.16)
Benefit Claimant	0.89	0.95** (0.25)	0.70** (0.22)	4.10 (2.72)
Local Economic Conditions				
: Vacancy Rate	0.70	0.16** (0.08)	0.11 (0.07)	0.47** (0.23)
: Wage Rate	5.10	0.41** (0.19)	0.51** (0.18)	1.05** (0.48)
: Unemployment Rate	2.33	-0.09 (0.06)	-0.16** (0.05)	-0.11 (0.14)
Selectivity Correction	1.22	0.08 (0.09)	0.09 (0.08)	0.09 (0.08)
Claimant * Duration 3–12 months	0.26	–	–	-0.10 (0.18)
Claimant * Duration 12–24 months	0.16	–	–	-0.22 (0.22)
Claimant * Duration 24 months+	0.35	–	–	0.24 (0.16)
Claimant * Vacancy Rate	0.63	–	–	-0.39 (0.24)
Claimant * Wage Rate	4.55	–	–	-0.59 (0.49)
Claimant * Unemployment Rate	2.10	–	–	-0.05 (0.15)

Diagnostics

$\bar{R}^2$		0.096	0.084	0.085
Standard Error		1.409	1.289	1.289
F Value (k,N–k)		19.652	16.864	13.888
Mean of Dependent Variable		3.140	2.365	2.365
Skewness		0.06	0.34	0.34
Kurtosis		0.08	0.003	0.003
Sample Size		4647	4647	4647

Note: Standard Errors in parentheses ** indictates significance at 95 per cent level, * indicates significance at 90 per cent level 2 tailed t test.

Table 4.3b (Females)

Estimated Determinants of Job Search Effort

Independent Variable	Sample Mean	Model 1	2	3
Constant		1.42	0.43	1.03
		(1.32)	(1.19)	(1.22)
Age: 16-24 years	0.38	0.03	-0.03	-0.01
		(0.08)	(0.07)	(0.07)
: 50-64 years	0.10	-0.47**	-0.49**	-0.45**
		(0.12)	(0.11)	(0.11)
Education: Degree	0.05	0.07	0.20*	0.22**
		(0.13)	(0.12)	(0.11)
: GCE	0.31	0.18**	0.18**	0.20**
		(0.07)	(0.06)	(0.06)
: Other	0.05	0.15*	0.18**	0.16**
		(0.08)	(0.08)	(0.08)
Single	0.46	0.13*	0.17**	0.13*
		(0.07)	(0.07)	(0.07)
Dependent Children	0.54	-0.15**	-0.13**	-0.13**
		(0.06)	(0.06)	(0.06)
Council Tenant	0.37	0.11*	0.07	0.07
		(0.06)	(0.05)	(0.05)
Presence of others in household				
: Unemployed	0.21	-0.10	-0.13*	-0.14**
		(0.07)	(0.07)	(0.07)
: Employed	0.70	0.07	0.11	0.09
		(0.08)	(0.07)	(0.07)
Health Problems	0.30	-0.09	-0.05	-0.05
		(0.06)	(0.06)	(0.06)
Moved to seek work	0.03	0.25	0.19	0.22
		(0.16)	(0.14)	(0.15)
Worked Before	0.87	0.02	0.07	0.04
		(0.10)	(0.09)	(0.09)
Previous job				
: Manual	0.27	-0.01	0.04	0.05
		(0.10)	(0.09)	(0.09)
: Manufacturing	0.15	-0.14*	-0.15**	-0.13*
		(0.08)	(0.07)	(0.08)
: Made redundant	0.25	0.29**	0.28**	0.26**
		(0.11)	(0.10)	(0.10)
Duration Seeking Work				
: 3 to 12 months	0.41	0.18**	0.13**	0.22**
		(0.07)	(0.06)	(0.09)
: 12 to 24 months	0.19	0.20**	0.09	0.02
		(0.09)	(0.07)	(0.11)
: 24 months +	0.22	-0.15*	-0.17**	-0.26**
		(0.09)	(0.08)	(0.10)

Table 4.3b (contd)

Independent Variable	Sample Mean	Model 1	Model 2	Model 3
Looking for Part-time work	0.35	-0.11 (0.21)	0.07 (0.19)	0.04 (0.19)
Benefit Claimant	0.54	0.70** (0.26)	0.59** (0.24)	-0.47 (0.69)
Local Economic Conditions				
: Vacancy Rate	0.71	0.16 (0.11)	0.15 (0.10)	-0.04 (0.15)
: Wage Rate	4.66	0.11 (0.24)	0.18 (0.21)	0.02 (0.22)
: Unemployment Rate	2.13	-0.12 (0.10)	-0.21* (0.09)	0.01 (0.11)
Selectivity Correction	3.49	0.12 (0.09)	0.18** (0.09)	0.15* (0.09)
Claimant * Duration 3-12 months	0.22	-	-	-0.14 (0.13)
Claimant * Duration 12-24 months	0.10	-	-	0.14 (0.15)
Claimant * Duration 24 months+	0.12	-	-	0.24* (0.14)
Claimant * Vacancy Rate	0.38	-	-	0.34* (0.20)
Claimant * Wage Rate	2.43	-	-	0.37** (0.13)
Claimant * Unemployment Rate	1.13	-	-	-0.45** 0.15

Diagnostics

$\bar{R}^2$		0.083	0.051	0.060
Standard Error		1.418	1.279	1.274
F Value (k, N-k)		10.570	6.329	6.004
Mean of Dependent Variable		2.718	2.116	2.116
Skewness		0.17	0.39	0.39
Kurtosis		-0.16	-0.08	-0.08
Sample size		2963	2963	2963

Note: Standard Errors in parentheses ** indicates significance at 95 per cent level * indicates significance at 90 per cent level 2 tailed t test.

Table 4.4

Alternative Specification of Search Effort Equation

Independent Variable	Male		Female	
Claimant	0.47	0.60	0.10	0.46
	(0.06)**	(0.22)**	(0.06)*	(0.24)*
Vacancy Rate	0.10	0.17	0.14	-0.17
	(0.07)	(0.11)	(0.10)	(0.16)
Wage Rate	0.51	0.50	0.20	-0.23
	(0.18)**	(0.21)**	(0.22)	(0.31)
Unemployment Rate	-0.15	-0.16	-0.16	0.02
	(0.05)**	(0.08)**	(0.08)**	(0.13)
Selectivity Correction	——	0.05	——	0.13
		(0.08)		(0.09)
Regional Dummies	No	Yes	No	Yes
$\bar{R}^2$	0.0834	0.0892	0.0496	0.0513
Standard Error	1.288	1.653	1.638	1.622
Sample Size	4647	4647	2963	2963

Notes: (i) Standard errors in parentheses.
(ii) Regressions contain same variables as in Table 4.3 in addition to those reported above.

Chapter 5: Labour market Transitions in England and Wales:

Evidence from the Labour Force Survey

5.1 Introduction

Job search is a necessary means by which to ensure future mobility. Decisions made by workers in the present will shape their labour force experiences in the years that follow. In this way, individuals will move continuously into and out of labour market states, conditional on their own and other's previous actions. This dynamic worker behaviour determines the composition of unemployment, employment and labour market inactivity. The following two chapters attempt to analyse aspects of this dynamic process using a previously unused characteristic of the Labour Force Survey (LFS), namely the ability to follow individuals over two discrete points in time. We concentrate our attention here on the relationship between movements of workers across labour force states and personal and environmental characteristics.

Given that the labour market is not static, but in continuous motion, then the ability to measure the movements of workers across discrete states facilitates a more complete understanding of how labour markets function. Dynamic issues have long been the focus of much empirical and theoretical research in the United States. Hall (1970), advanced the idea of worker heterogeneity as a possible explanation for the persisitence of unemployment in tight labour markets. These differences led to the propensity of certain groups of workers to experience unstable employment relationships over time. Perry (1972) pursuing the same argument, explicitly adopted a probablistic approach to modelling these flows into and out of employment. To capture

individual heterogeneity, the probability of state experience was allowed to vary across workers, though interestingly Perry modelled these probabilities solely as a function of aggregate variables. Marston (1976) conducted a comprehensive evaluation of the flows between all labour market states including the previously neglected area of non-participation. Using a technique followed closely in this study, Marston modelled state transition probabilities as a function of personal characteristics and aggregate conditions. The former dominated the explanation of observed turnover behaviour.

The observation that the unemployment stock was characterised by simultaneously large flows into and out of the state was seen by many economists (see Feldstein (1975) for example), as evidence that unemployment was caused by the employment instability of certain demographic groups and that remedial policies were to be directed at encouraging longevity in jobs. Clark and Summers (1979) utilised dynamic micro data to counter this argument. The authors demonstrate that the majority of unemployment experience was comprised of spells with extensive state duration.

All these studies were made possible by micro-economic survey data which follow individuals over a period of time. The monthly Current Population Survey (CPS) or Denver Income Maintenance Experiment (DIME) are notable examples of longitudinal datasets rich in labour market information. No comparable dataset exists for the United Kingdom. Hitherto, in order to address dynamic issues the researcher had to utilise the retrospective data contained within the LFS. Every year the LFS incorporates a series of questions which seek to ascertain the respondent's circumstances one year prior to sampling. The range of this information is somewhat limited and the responses are open to the

possibility of recall error bias. Individuals cannot always remember with clarity their status one year earlier. Hence the scope for detailed retrospective analysis is restricted.

This chapter shows how it is possible to expand the capability of the LFS to provide dynamic information. We study labour market behaviour over the interval 1983-1984 using a dataset obtained by matching individuals observed in consecutive surveys. This considerably enhances the amount of information from which to launch an empirical investigation of labour force flows, whilst simultaneously removing the possibility of recall error germane to the retospective data.

In analysing labour force turnover, we adopt the Markovian framework first used by Marston (1976). We model gross and individual probabilities of transition between the states of employment, unemployment and non-participation. The likelihood of any observed transition is therefore solely dependent upon the initial state in which the worker occupies. We then employ a reduced form approach to model the probability that an individual will be observed employed, unemployed or a non-participant one year later, as a function of personal and origin state characteristics.

We do not estimate transition rates, that is the instantaneous probability of a change of state, since there is no guarantee that our sampling interval corresponds to the time taken for any change of state to occur. Our results for annual labour force transitions are however dependent on the effects of the explanatory variables on these transition *rates*.

Section 5.2 outlines the theoretical framework to our study. Within the broad context of Markovian analysis we outline the possible factors affecting movements out of employment, unemployment and

non-participation. Search theoretic considerations apply to many of these flows, particularly labour force or employment entry. Section 5.3 describes our dataset and the manner of its construction, whilst section 5.4 presents the results of our investigation. Section 5.5 provides concluding comments to the effect that worker heterogeneity is the dominant influence in unemployment and participatory flows, whilst state spell length dominates employment outflows. Individuals exhibit differential transition probabilities and therefore experience different employment, unemployment and inactivity rates.

5.2 Theoretical Framework

5.2.1 Measuring Transitions

We seek to model the movement of individuals across labour market states. Assume there are three states of the world to which an individual can belong; employment, unemployment and labour force inactivity. Individuals move continuously between these states of the labour market. This dynamic behaviour has been modelled as a continuous time Markov process by Marston (1976), Clark and Summers (1979,1982a) and Burdett et. al. (1984), among others. Given three potential states, nine annual flows can be determined. These movements between states can therefore be captured by a 3x3 matrix of transition probabilities, Pi where

$$Pi = \begin{bmatrix} ee^i & eu^i & en^i \\ ue^i & uu^i & un^i \\ ne^i & nu^i & nn^i \end{bmatrix}$$

and eu^i, for example, represents the probability that an individual is observed unemployed at time t, conditional upon being employed at time t-1. The approach adopted in this paper acknowledges this Markovian framework. We model individual annual labour force transitions by a series of multinomial logit regressions. This enables us to estimate the probabilities of state transition as a function of personal characteristics pertaining in the origin state and local economic conditions.

We do not attempt to model the instantaneous probability of transition, i.e. the hazard rate, since our data do not permit it. If labour market dynamics do indeed follow a continuous time Markov process, then the time between transitions is a random variable. As Singer and Spillerman (1976) point out, given discrete panel data, such as ours, there is no guarantee that the time unit between labour market changes corresponds with the sampling interval. Knowledge of transition rates, does however make possible inferences regarding state duration and steady state equilibria. Indeed Marston (1976), and a series of studies by Clark and Summers (1979, 1982a, 1982b) consider monthly movements as being synonymous with transition rates, an approach which in view of the above discussion appears flawed.

Our data set contains annual observations. Coppock, commenting on Clark and Summers (1982b) demonstrates the problem of modelling annual labour force transitions as if they corresponded to the instantaneous rate of change. In a two state continuous time Markovian world, the distribution of state spell length is an exponential function that is independent of the time the worker enters the state. The probability of movement from state j between times u and t, is given by

$$f_j(t/u) = r_j \exp^{-(t-u)r_j}$$

where r_j is the instantaneous rate of transition from state j. In a three state world the analagous density function becomes

$$f_j(t_{jk}, t_{jl}) = r_{jk} \ r_{jl} \ \exp \ (-r_{jk}t_{jk} -r_{jl}t_{jl})$$

where t_{jk} and t_{jl} are the time between transitions into states k and l respectively and r_{jk} and r_{jl} are the corresponding transition rates. Coppock shows that the probability of moving to state k, for example, over a fixed time interval and allowing only a single transition, is given by the integral of the above product with respect to $t_{jk} < 1$ and $t_{jk} < t_{jl}$.

i.e. $$P_{jk} = \frac{r_{jk}}{r_{jk}+r_{jl}} [1-\exp(-r_{jk}-r_{jk})]$$

The explanatory variables at our disposal determine not the transition probabilities P but transition rates, r. Hence ex-ante theorising regarding the effect of a particular variable on the transition rate r_{jk} say, would not necessarily appear in any regression of that variable on P_{jk}, since there may be a simultaneous opposing effect from r_{jl}. Our results presented in section 5.4 should therefore be interpreted with this important caveat in mind.

In modelling labour market dynamics as functions of individual and state characteristics we explicitly forego the assumptions of the pure Markovian framework of stationary, homogenous transition rates. It is likely that our estimates will exhibit some form of population heterogeneity or time dependency. Heterogeneity, the variation of transition rates between individuals with different characteristics both

unobservable and latent, results in the greater propensity of certain individuals to experience particular states. If, for example, certain groups are more likely to experience unemployment and therefore have a low probability of transition, then over an extended period of time the probability of observing the same individual in the same state, approaches unity. Over time the aggregate probability of escape from unemployment falls as those with high transition rates move away and those with low transition rates remain. This same effect could be observed however, were transition rates conditional upon the duration of spell. If experience of unemployment (or any other state) somehow affects the probability of movement, then the transition rates, as with sorting, will be time dependent. The nature of our data set prevents us from explicitly discriminating between these competing hypotheses (see Tuma and Hannan (1979) or Heckman and Borjas (1980) for possible tests requiring detailed information on state duration and transition times which are missing from our dataset). Instead we introduce variables into our regression analysis that are supportive of both contentions and assess their relative merits.

We now outline the principal variables that could be expected to govern these labour market flows.

5.2.2 Exit from Unemployment

Over a period of one year an unemployed individual may leave unemployment either by gaining employment or by withdrawing from the labour force. In the search theoretic context used by Toikka (1976), Burdett and Mortensen (1978), or Barron and Mellow (1981), optimising individuals will choose that state which offers the highest expected return. Mortensen and Neumann (1984) extend this earlier work into a

structural form approach, dividing transitions into the "chance" component of informational arrival and the "choice" of whether to change state. The greater the opportunity for movement, the more likely future mobility. The dataset at our disposal is insufficiently detailed to follow this line, which requires information on wage offers, realised wages and state duration. Instead, our reduced form approach can be expected to capture elements of both these influences. Jovanovic (1984) offers a similar explanation within the context of a job matching explanation of turnover. We can summarise the expected effect of our explanatory variables as follows:

$$U=U[Effort, \ Benefits, \ Duration, \ Z,X]$$

$$UE_{\rightarrow} \quad + \qquad ? \qquad \qquad - \qquad + \ ?$$

$$UN_{\rightarrow} \quad - \qquad - \qquad \qquad + \qquad - \ ?$$

Consider the likely flow into employment. The probability of a worker engaged in active job search becoming employed over the period is the product of the probability of contacting a job opening and the probability that the vacancy is acceptable to the worker. The likelihood of receiving a job offer is partly dependent on the economic conditions, Z prevailing in the labour market in which the worker is searching. The tighter the labour market, the greater the demand for labour and the higher the probability of receiving or indeed contacting a job offer. Improved economic conditions should lead to increased wage offers, thereby increasing the returns to search. This should also enhance the acceptability of any offer, assuming reservation wages do not rise correspondingly with the increased availability of work.

We argued in chapter 4 that the more effort spent searching the

labour market, the higher the likelihood of meeting a job offer and, assuming a negligible effect of variable search effort on reservation wages, the greater the probability of gaining employment. Hence the positive sign on effort. Should there exist any form of duration dependence, then the probability of generating a job offer will diminish with the time spent in unemployment. Long term unemployment may act as a hiring deterent to potential employers. The unemployed may find their stock of human capital depreciating as skills become obsolete and contacts with the labour market recede. Against this, it is conceivable that the long term unemployed will reduce their reservation wage over the spell, becoming more likely to accept any job offers. Individuals embodied with differential amounts of human capital, as captured in the vector of personal characteristics, X, may possess heterogeneous reservation wages and job offer probabilities. The higher the stock of human capital the higher the probability of gaining employment, other things equal.

Now consider the transition from unemployment to out of the labour force. Such a movement is only feasible if the expected returns from non-participation exceed those from remaining in the labour force. One would expect adverse economic conditions, Z to reduce the expected return from search and raise the flow from unemployment into non-participation. The greater the degree of search effort, the greater the value to staying within the labour force. A similar argument can be applied to those embodied with larger amounts of human capital – the returns from continued participation are potentially higher. Individuals possessing only small amounts of human capital, or the long term unemployed, may find that the likelihood of receiving a job offer is diminished and the subsequent probability of labour force withdrawal

increased.

Finally, Barron and Mellow (1981) have argued that the receipt of unemployment benefits in the US, increases the cost of leaving the labour force, since they are foregone upon cessation of job search activity. Barron and Mellow also argue that benefit recipients will reduce their probability of gaining employment over a period because of resulting increased reservation wages and purchases of leisure at the expense of time spent searching the labour market. Chapter 4 has however shown that benefits can increase search effort and hence the probability of receiving a job offer, by facilitating job search productivity. If claimants are more committed to the labour force, they have a lower marginal value of leisure, this too should enhance job offer probabilities. We investigate whether this or the reservation wage effect dominates unemployment transitions in section 5.4. Stronger commitment and the type of entitlement effect envisaged by Hammermesh (1979), whereby a condition of benefit receipt is that the indvidual should be actively seeking work, should ensure benefit claimants remain in the labour force.

5.2.3 Employment Separation

Workers leave jobs either voluntarily i.e. they quit, or involuntarily - they are laid off. Only job quits are consistent with a search theoretic interpretation of employment out-flows. Layoffs result from the optimising decisions of firms regarding the productivity of job matches. We do not distinguish between quits and layoffs, unlike Marston (1976), since any employment terminations occur after our initial sample observation and the manner of job separation is therefore endogenous. It is likely that our estimated coefficients will reflect

elements of both quit and layoff behaviour. We postulate that

$$E = E[\text{Tenure, Job Characteristics, } Z, X]$$

$EU_\Rightarrow$	$-$	?	?	?
$EN_\Rightarrow$	$+$	?	$-$	?

The more job-specific capital a worker has acquired the more valuable the firm and worker are to each other and the less likely a flow into unemployment, involuntarily or otherwise. In practice firm-specific skills are captured by job tenure; the longer the tenure, the more profitable the job match and the less likely a separation. A reduced rate of flow into unemployment with increased tenure, having controlled for any population heterogeneity in the propensity to move, would be evidence of a positive form of state dependence. Individuals will enter into search unemployment if the expected returns from so doing exceed both the cost of not searching and on-the-job search. We argued in chapter 3 that this is generally only valid if economic conditions are such that the expected duration of unemployed search is low or the non-pecuniary aspects of the current job are sufficiently bad to induce the worker to give up on-the-job search. Involuntary employment to unemployment flows are however likely to be generated by adverse economic conditions, Z, which would tend to offset the effect from job quits. It is well established that manual workers are more prone to layoffs and hence flows into unemployment. This flow may be reinforced by the undesirable non-pecuniary nature of many manual jobs. Individuals less skilled, educated or able are more open to lay-offs. If these individuals also find themselves in the secondary labour market, there may well be an enhanced flow into unemployment from job

quits.

It is likely that job quits will dominate the flow into inactivity. However, since our sampling interval is one year, it is conceivable that our dataset contains individuals who spent (a short) time searching the labour market before withdrawal. The UK benefit administration system, which disqualifies job quitters from receiving social security payments for twelve weeks after leaving work, should also enhance this flow out of the labour force[1]. We would expect such flows to appear at either end of the age spectrum. Clark and Summers (1979, 1982b) have commented extensively on the ambiguity of the unemployed and out of the labour force states for young workers, for whom the costs of (temporary) labour force withdrawal are slight given their potential working time horizon. A similarly observed flow for older workers, in contrast, is more indicative of permanent labour force withdrawal. The likelihood of re-employment and the expected returns from such will often be insufficient to retain a labour force commitment given the existence of pensions and other non-labour income. Many women may enter non-participation directly from employment in order to engage in home production. The status of many women as secondary household workers ensures a lesser commitment to the labour force.

5.2.4 Labour Force Participation

The decision to enter the labour force is contingent upon the expected returns from so doing exceeding the value of non-market time. Flows into employment or unemployment can be envisaged as incorporating a two tier reservation wage system, whereby individuals enter search unemployment if the value of non-market time falls below the first reservation price, and subsequently enter employment from unemployment

if a wage offer exceeds the second reservation price, that evaluating continued market search. The closer the two reservation wages the more likely it is we observe a direct flow from non-participation to employment over an extended period of one year. Hence

N=N[Duration, Z, X]

NU⇒   −   +   ?

NE⇒   −   +   ?

One might expect aggregate conditions to influence the participation decision. The higher the market wage, the greater the cost of remaining outside the labour force. The lower the unemployment rate, the higher the expected return from participation. Such conditions should enable discouraged workers to re-enter the labour force and resume job search. Conversely adverse economic conditions may encourage the added worker effect of labour force entry of secondary household workers, responding to the unemployment of the primary worker, in an endeavour to maintain household income levels. If a two tier reservation wage system does indeed operate then the two wages are likely to be closer for secondary than primary workers. If a secondary worker has been induced to substitute some or all non-market time for labour force activity, then it is likely that the worker will be more willing to accept the first offer that exceeds the value of non-market time. Hence the probability of an (almost) direct transition from non-participation to employment is increased.

Differential reservation wages are not sufficient to guarantee differential non-market to market transitions. Such movements must also be governed by the probability of receiving job offers which is in turn

dependent upon search intensity, the area of search and human capital accumulation, as in the case of transitions from unemployment. We would expect a similar form of negative duration dependence on transitions by primary workers to that of the unemployed. As time spent outside the labour force increases, job related informational flows are likely to fall, search intensity may decline, and with it the probability of labour force entry. If secondary workers do not retain as close an attachment to the labour market then a constant flow of information is not as necessary should they desire to resume participation. In this way, excepting any heterogeneity effect, there may be no clear link between time spent out of the labour force and the likelihood of re-entry. Household composition should exert a strong influence on the participation decision of secondary workers. In particular the presence of a working spouse and dependent children would be expected to act as deterrents to labour market entry. The entry into employment of secondary household workers may lower an unemployed spouse's benefit entitlement. If the expected earnings of the latter are higher, this may deter the former from participation.

5.3 Data and Estimation

Our analysis of labour market transitions is based on a dataset constructed from the 1983 and 1984 Labour Force Surveys (LFS). The LFS contains information regarding the labour market activity, personal and family characteristics of around 0.5% of the households in Great Britain. In each year since 1984 the LFS has incorporated an approximate 30 per cent overlap of the addresses sampled in the previous

year's survey. By matching personal characteristics of the recall group, (for example month and year of birth, sex, age of dependent children, housing tenure), across the two surveys, we have obtained a dataset containing detailed labour force information for 1983 and 1984 on 7,172 individuals resident in England and Wales (the identifying re-sample variable does not extend to Scotland or Northern Ireland). By observing an individual's labour market status in 1983 and 1984, we can obtain estimates of annual flows between states.[2]

Our sample is not entirely random since the LFS re-interviews addresses and not individuals. We are therefore unable to identify households who moved away during the course of a year or new households created in the interval between surveys. If there is a correlation between household and labour mobility we may introduce a form of selectivity bias into our analysis.[3] In addition we are unable to prevent spurious transitions that arise from the mis-reporting of labour force status, often by a third party respondent to the survey. The effect of the latter could however work in the opposite direction to that of the former. An annual survey should however avoid the problems which characterise the monthly Current Population Surveys in the United States, namely the conditioning arising from the continuous interaction between respondent and interviewer (Sexton (1986)).

It may be argued that a year is a sufficiently long interval to enable the numbers in each state to approach their equilibrium, steady-state values. We would then gain no extra information in our panel than from two consecutive surveys. The period 1983-84 was however characterised by rising unemployment. In none of our three states did inflows equal outflows, which would characterise an equilibrium.[4] Table 5.1 provides some indication as to the representativeness of the sample,

by presenting the composition of our panel alongside the equivalent Labour Force Survey estimates. In general the compositions are broadly similar. We cannot reject the hypothesis that the samples are from the same distribution (the X^2 test for equality is 0.25 ~ $X^2(2)$)[5]. The unemployed are marginally under-represented in 1983. We are unable to identify those members of the unemployed with a high propensity to move. Chapter 2 showed that the unemployed are more likely to move regions. Hughes and McCormick (1985) provide a complementary analysis which suggests that the unemployed are more likely to consider a change of address. Similarly we lose those in employment who simultaneously engage in inter-firm mobility and a change of address (some 25 per cent of all inter-firm moves). This may have a corresponding effect on our estimated transition probabilities. In addition, some of the estimated flow probabilities may be subject to small sample bias, particularly the unemployment outflows which are based around an initial stock of just 554.

Since our matched data set contains no information regarding wage rates we have supplemented it with the wage rate pertinent to the individual's local labour market (one of 16 identifiable areas disaggregated to metropolitan county level). In addition, we include measures of the local vacancy and unemployment rates as proxies for the level of demand (see data appendix). All local economic variables enter the equations in log form.

The Markovian framework adopted in this chapter posits that the gross annual probability of transition from state i to state j, Pij, is given by

$$Pij = \frac{Fij}{Si} \qquad i,j = 1,2,3$$

where Fij is the number of individuals observed in state i in 1983 and state j in 1984 and Si is the stock of individuals occupying state i in 1983.

Individual transition equations are estimated by multinomial logit regression. Since our analysis is essentially Markovian we recognise the possibility that the probability of transition will depend upon the original state in which the individual is observed. The inclusion of duration variables implies we estimate a semi-Markov process in effect. We present separate equations for each of the three origin (1983) states, employment, unemployment and out of the labour force. The dependent variable is evaluated according to whether the individual is observed employed, unemployed or inactive one year later. Hence the probability of transition from state k to state j

$$Pkj = \frac{\exp[X_j \beta]}{\sum_{k=1}^{3} \exp[X_k \beta]} \qquad j, k = 1,2,3.$$

We confine our estimates to the population of working age (men aged 16 to 64 and women aged 16 to 59). All explanatory variables relate to the individual's circumstances at the time of the 1983 Labour Force Survey. We do not restrict the set of explanatory variables to be the same for each regression, unlike Kiefer and Neumann (1982) or Burdett et al (1984), since as we have outlined in section 5.2, a transition from any state is dependent on that state's particular characteristics.

5.4 Results

5.4.1 Gross Labour Force Flows

Table 5.2 presents gross annual transition probabilities for various age and sex groups. If the transitions were governed by a Pure Markov process (homogeneous, stationary rates) then each individual would face transition probabilities given by row 1.

Although we cannot discount the possibility of multiple transitions over our sample interval, the continuity of employment, and to a lesser extent inactivity, is most apparent. Ninety-three per cent of individuals employed in 1983 continued to be so one year later and 76 per cent of those out of the labour force were observed in the same state over the period. In contrast, fifty per cent of the 1983 unemployed stock were similarly placed in 1984. These changes in unemployment were characterised by large flows into and out of the state. There exists an almost equal probability of flowing into employment or out of the labour force. New labour force entrants were twice as likely to enter employment rather than unemployment over the period. Employment separation resulted in an equal likelihood of flowing into active job search or labour force withdrawal.

One of the advantages of our dataset is that it can be used to determine inflow and outflows for our three state model. In a steady state with a homogenous population these flows will be equal and a panel would contain no more information than a single cross section. We calibrate these flows by multiplying the transition probabilities in row one by the initial stocks of each state (given in the note at the foot of Table 5.2)[6]. For example a constant unemployment rate would require the following flow equality

$$eu*U + nu*N = (ue + un)*U$$

Similar expressions can be derived for stability in the other two states. The results do not support the steady state hypothesis. Inflows and outflows from each state are never equal.[7] It would appear our dataset does indeed contain some additional explanatory power.

These aggregate flows do however disguise important differences between the various demographic groups. Teenagers, (rows 3 and 7) for example, are more likely to flow into unemployment from employment than other workers. They are also more likely to flow out of unemployment back into employment, indicating the relative brevity of teenage unemployment spells and the tendancy for teenagers to engage in job shopping early in their careers. (see Wadsworth (1989) for some UK evidence on the high incidence of job quits among young workers). Males demonstrate a stronger attachment to the labour force by being less likely to flow into non-participation than women, either from employment or unemployment. The likelihood of males gaining employment (UE or NE) declines notably over the age cycle. Above the age of fifty the probabilty of male labour force withdrawal exceeds the likelihood of gaining employment (row 5). In contrast the probability of women obtaining employment shows no systematic trend over the age cycle (rows 7 to 9). Female labour force entry remains high until the age of fifty. In part this will reflect the opportunities for secondary employment, particularly part-time work.

Clark and Summers (1979) question the distinction betwen unemployment and out of the labour force status, on the basis of monthly flows of United States teenagers and young adults. They argue that because a large proportion of youth unemployment ends in labour force

withdrawal and that youth flows into employment from outside the labour force dominate similar flows from unemployment, then there is little to distinguish the two states of unemployment and out of the labour force. Flinn and Heckman (1983) counter this argument by maintaining that the state of unemployment must involve some form of active job search which will increase the likelihood of receiving a job offer. In this way one would expect differential transition probabilities into employment from unemployment and out of the labour force. Although the figures in Table 5.2 do not control for all observed or any unobserved characteristics, the flow probabilities into employment from unemployment are between fifty to three hundred per cent higher than the equivalent flows from out of the labour force. This would seem to imply that the LFS data are not subject to Clark and Summers' criticisms.

Perry (1972) uses the difference in the transition probabilities, EN and UN as a measure of involuntary labour force withdrawal. The rate of exit from employment is said to represent 'normal' turnover, due for example to retirement, illness or domestic demands. On this basis row 1 suggests that 3.4 per cent approximates the normal turnover rate. In contrast 20.9 per cent withdrew from unemployment. Most labour force exits from unemployment would appear to be influenced by the chances of finding a job. At the same time, such a flow will be self-reinforcing, since, as Table 5.2 shows, any movement out of the labour force reduces the likelihood of subsequent employment.

It may be constructive to now compare our results with those that can be derived using retrospective LFS data. Following Sexton (1987) we estimate transition flows using recall data and construct the ratio of the true to the retrospective flow figure as a measure of the divergence between the two concepts. Table 5.3 presents the results. The

transition ratio is given by A_{ij}/R_{ij} where A_{ij} is the actual number of individuals moving from state i to state j and R_{ij} is the equivalent figure arrived at using retrospective responses. A value exceeding unity indicates that the recall data under-estimates the true flow.

Transition rates estimated using recall data generally under-predict the true rate. Individuals asked to define their status one year earlier, tend to align themselves with current status (row 1). In particular there are large discrepancies between the flows into and out of employment and unemployment from out of the labour force. The retrospective flows for prime age males are the most consistent with our matched flows. One obvious explanation for these differences is a failure by the respondent to recall the exact timing of state transitions. Individuals may recall a continuity of state experience over the year, when in fact a change of state occured within the period.

Secondly, there is no exact correspondence between true and recalled status, the latter being much less precise in defining economic activity.[8] It is therefore conceivable that many people who believed themselves to be unemployed one year ago were in fact classified as outside the labour force, under a more detailed classification. Similarly, many women and older men (rows 6 and 5 respectively) who recalled their main status as being outside the labour force (household duties or retirement, for example) may be simultaneously engaged in part-time or temporary work and as such would be classified as employed using the true status criterion.

The potential for misleading inference when using retrospective data to analyse flow rates is therefore clear. The problems are magnified the smaller the sample size. A matched sample explicitly avoids these recall problems.

The effect of these estimated differential flow probabilities does however depend upon the size of the initial stock, (Marston (1976)). For example, using our matched dataset, a 1 per cent flow from employment into unemployment would increase the unemployed stock by an equivalent amount that a 9 per cent unemployment outflow would reduce it. Table 5.4 indicates the impact of these flows on labour force composition. Column 1 illustrates the importance of labour force entry and exit in explaining employment, particularly of teenagers and women. Sixty-five per cent of these employment accessions occured from individuals outside the labour force one year earlier. Prime age males however demonstrate a stronger labour force attachment since over 80 per cent of employment inflows of this group come from those unemployed one year previously. Column 4 suggests around 50 per cent of labour force exits come from employment. Clark and Summers' estimates indicate a figure in excess of 70 per cent. This appears to stem from the greater propensity of US teenagers to leave the labour force. Sixty-eight per cent of male teenagers left the labour force from unemployment in the course of a month in the US study compared with just 16 per cent in our study over one year. The thrust of Clark and Summers' argument is however that youth labour force withdrawal is only a temporary phenomenon. Our results are diluted by the sampling interval. We cannot discount the possibility of multiple changes of state between survey dates. It is probable that during a year many teenagers will re-enter the labour market and this will be reflected in a lower annual exit probability. The fact that our exit flows are dominated by older workers indicates the reduced likelihood of gaining employment for such groups. Around 25 per cent of the flow in column consists of entry into discouragement rather than general inactivity.[9]

Column 3 suggests that the majority of adult male unemployment is composed of inflows caused by job separations. In contrast, teenage and female unemployment is caused by an inability to find work upon labour force entry. Yet most teenagers and women experience little difficulty gaining work (column 5). This indicates a degree of heterogeneity within these groups that renders certain individuals more likely to experience employment than unemployment. We explore the possible explanations in our regressions below.

5.4.2 Transitions From Unemployment

Table 5.5 presents the results of our multinomial logit regressions on the probability of leaving unemployment. Estimates are given by destination state. We provide separate estimates for men and women. We present coefficient estimates only for the effect of the explanatory variables on a change of state, since the normalisation constraint in our programme requires the sum of the coefficients on each variable across all three states to equal zero.

The results indicate that those individuals with the most to gain from active job search are the most successful in terms of obtaining employment. Educational qualifications help build human capital. Young people with longer potential working horizons are more attractive to employers who have more chances of recouping hiring and training costs than from older workers. In a similar manner the expected returns from employment to an older worker faced with a shorter work horizon, may not justify search expenditure and labour force exit becomes a more viable option.

Surprisingly single women are less likely to gain employment. Given the relatively lower value single women will place on non-market time,

one would expect single women to search harder. It may be that the coefficient, which is not robust, reflects the increased opportunities for part-time work relative to full-time and that such jobs are more attractive to married women. The presence of an employed spouse greatly increases the likelihood of an employment accession. The flow of information regarding job offers is likely to be enhanced if the household contains members actively engaged in the labour market. Council tenants maintain a stronger attachment to the labour force but are simultaneously less likely to obtain work. This effect is well documented. The presence of council tenure in our regressions partly controls for differential human capital stocks.

The hypothesised effect of search effort on unemployment flows is confirmed, albeit insignificantly for women. As in chapter 4, this variable captures worker search extensiveness. The more informational flow outlets an individual utilises, (employment agencies, newspaper advertisements, personal contacts for example)[10] the greater the likelihood of receiving a job offer and the more likely the flow into employment. Such actions also help to keep the individual inside the labour force. The additional effect of unemployment benefit receipt, for a given measured level of effort, is not clear. In the case of males, benefit claimants are more likely to enter employment. The effect of benefit receipt in generating increased labour force commitment more than offsets any reduction in job acceptance resulting from an increased reservation wage. Clark and Summers (1982a) also report an insignificant positive coefficient from an imputed benefit variable in their analysis of unemployment outflows. The reverse is however observed for women. Neither effect is significant, though we would certainly dispute Barron and Mellow's (1981) claim that 'receipt

of UI benefits implies a sharp decline in the employment probability'.
Benefit claimants are also less likely to withdraw from the labour
force, supporting Hammermesh's (1979) contention that entitlement to
unemployment insurance will increase labour supply.

The effect of duration on unemployment outflows is not strong and
differs between the sexes. Unemployment outflows are dominated by
heterogeneity. We argued in section 5.2 that evidence of duration
dependence would be consistent with a declining unemployment to
employment escape probability as the length of unemployment spell
increased. Our results for men give only weak support to this
hypothesis. The longer an unemployment spell proceeds the smaller the
likelihood of gaining employment and the greater the chance of labour
force withdrawal. Whether this observation is indeed due to state
dependence or to any uncontrolled heterogeneity, we are unable to say.

No such effect is observed for women. The probability of employment
entry appears initially to increase with unemployment spell. Whilst not
significant, this observation suggests that a high reservation wage
strategy operates in the initial stages of unemployment which
subsequently declines as the number of job opportunities begins to
recede. Women unemployed for between one and two years retain a stronger
commitment to the labour force than any other duration grouping.
Narandranathan (1989) also finds that the conditional probability of
leaving unemployment shows no sign of decreasing with duration. Given
the necessary caveats regarding how we measure transitions in this
dataset, heterogeneity appears to exert a stronger influence on
unemployment outflows. Only by removing all the observed heterogeneous
variables from the regression do the duration variables become
significant and signed consistently (for men) to accord with state

dependence.

Individuals laid off from a previous job have a higher probability of regaining employment and are less likely to leave the labour force than job quits. If job losers possess a lower marginal value of leisure then it is likely they will search harder and as a result increase the chances of receiving a job offer. In contrast, job leavers may have higher reservation wages in the search for a more acceptable job, at least in the initial stages of unemployment. This probably explains the negative coefficient on the degree qualifications dummy. These workers are more likely to have quit their previous jobs. The larger flow of job quitters out of the labour force is somewhat puzzling. It cannot be a retirement effect since we have explicitly controlled for age. Clark and Summers (1982a) report a similar result for the US. It may be that the higher values of non-market time determine a worker's attachment to jobs.

Finally, we were unable to capture many strong effects of aggregate conditions on unemployment outflows. Men living in high wage areas are more likely to flow into employment and less likely to leave the labour force. This is consistent with the idea of high expected returns from work encouraging active job search and participation. However, the sign of the wage coefficient is reversed in the female regression. If anything this suggests some form of female added worker effect. We experimented with a real wage variable, deflating regional earnings by a local house price index, with little success. The effects of local demand conditions are somewhat difficult to interpret. Males are equally likely to flow into employment from high vacancy and high unemployment areas and for women the opposite is observed. Although in the case of males, neither coefficient is robust to the inclusion of

regional dummies. The small size of our sample makes it hard to assess the magnitude and direction of any effect from aggregate conditions.11 It may also be that by removing the more mobile members of the population from our sample we inadvertantly eliminate those more likely to respond to economic signals.

5.4.3 Transitions from Employment

Table 5.6 presents estimates of the impact of our explanatory variables on the transition out of employment. We argued in section 5.2 that evidence of both quit and layoff behaviour could register in our results. The estimated effect of job tenure, for example, is consistent with both interpretations. We find strong evidence that the probability of flowing into unemployment declines with the length of time spent on the job particularly for men. This supports both the idea that firms will retain workers with more job-specific capital and that these workers are simultaneously less likely to quit. Workers capable of extracting more rent within a firm are likely to have discounted any non-pecuniary aspects of the job. Long service workers dominate the flows into non-participation. This probably represents early retirement decisions. It may also be due in part to the job severance of workers endowed with large amounts of firm specific capital, who on subsequently facing less attractive re-employment probabilities, are more likely to retire from active job search than similarly aged workers with shorter tenures.

Manual workers are more likely to flow into unemployment, presumably because of their high chances of layoff, though this effect is insignificant. We were unable to obtain any significant effect from any

further disaggregation of the occupation variables or the inclusion of industry dummies, and the remaining coefficients were largely unchanged. This is again probably attributable to the small number of movers in our sample.

Those engaged in work of a temporary nature are however significantly more likely to become unemployed within a year. Males in particular demonstrate continued labour force commitment by being less likely to withdraw from the labour force. Men employed at workplaces with fewer than twenty-five employees are marginally more likely to experience unemployment, but significantly less likely to escape the labour force. This may reflect the occupational and industrial distribution of small plants.[12] If the prospects for re-employment are sufficiently good, the incentive to remain in the labour force is stronger. The major effect of part-time working on the employment transitions of men and women, is to increase the likelihood of labour force withdrawal. For women, this is supportive of a secondary worker hypothesis, with women dividing their working hours between market-time and home production. Upon termination of employment, whether voluntary or involuntary, many women will withdraw from the labour force and concentrate on household work until such times as a new employment opportunity presents itself. It is also known that for many older men, part-time working facilitates the movement from labour force into retirement.

Individuals engaged in on-the-job search demonstrate strong labour force attachment. Yet surprisingly they are significantly more likely to be observed unemployed one year after sampling. If workers have undertaken on the job search then it must be because the expected returns from so doing are greater than quitting into search unemployment

(Burdett (1978)). Our observations may therefore be due to a change in the respective opportunity sets of on and off the job search inducing a quit into full time (unemployed) search. Alternatively, we saw in chapter 3 that workers in industries with high redundancy rates were more likely to engage in on-the-job search. This effect may therefore capture job search by employees with the knowledge that an employment termination is imminent, (advanced notification of a redundancy is a condition of the 1975 Employment Act), who are subsequently unsuccessful before leaving work. Indeed two thirds of all male and 50 per cent of female job seekers subsequently found to be in unemployment report that they were laid off from their previous work. Of course some job seekers are successful. The normalisation constraint implies that the coefficient for remaining employed (i.e. the flow EE), are also positive. We estimate that 20 per cent of this EE flow of on-the-job seekers involves inter-firm mobility. We pursue this further in chapter 6.

The impact of personal characteristics on employment transitions, differs across the sexes. We have already seen that the young are more likely to flow into unemployment and the elderly into non-participation. This is confirmed in Table 5.6. Quits into search unemployment and layoffs are more likely among the young, but the returns to staying in the labour force remain greater. The longer the working horizon, the greater the ability to engage in job shopping. The more educated a worker the less likely an unemployment inflow and the more likely a labour force withdrawal. This reflects the value of a skilled worker to a firm and in part the nature of the work in which more educated people are placed. The dominance of layoffs in the male EU flow[13] and quits in the EN flow, implies the education variables partly capture the

voluntary-involuntary nature of these movements. Chapter 3 has demonstrated the capacity of more highly qualified workers to search on, rather than off, the job. Hence we are less likely to observe a transition into search unemployment. Similar arguments apply to the effects of council housing tenure on labour market status. Single women maintain a closer attachment to the labour force, since the need to work is paramount. The presence of dependent children only significantly effects the labour force transitions of male employees, simultaneously keeping them in the labour force but rendering them more liable to unemployment.

The effect of local economic conditions is again weak. Men working in high wage areas are more likely to flow into unemployment.[14] This is inconsistent with a search theoretic explanation of events, though may suggest a greater tendency of workers in high wage areas to be more prone to layoff. A similar signed wage variable was obtained by Marston (1976) in an OLS estimation of US employment outflows. We speculated earlier that the sign of the effect of local demand conditions was ambiguous, dependent on the dominance of quits and layoffs in employment outflows. Quits tend to be pro-cyclical, layoffs counter-cyclical. There is weak evidence that layoffs dominate male unemployment inflows and that workers remain in the labour force where there is more opportunity for employment renewal and a consequent higher expected return from job search. No clear pattern emerges from the female flows. Female unemployment inflows are composed almost equally of job quits and layoffs. Hence these two opposing influences may render the economic indicators insignificant.

5.4.4 Transitions into the Labour Force

Table 5.7 examines the annual probability of labour force participation of those classified inactive in 1983. Men with previous labour force experience who lost their last job through layoff, are demonstrably less likely to regain employment, should they resume participation, than job quitters. This effect is probably linked to the coefficient on discouraged workers. A laid off worker is more likely to suspend job search if the perceived opportunities for re-employment are sufficiently low, only returning to active search if the expected returns improve. In contrast a job leaver may view a spell out of the labour force as leisure. The young in particular face a higher probability of re-hiring, as captured in the gross flows in Table 5.2. As a consequence they lose less from a temporary period of labour force withdrawal. Female job losers are more likely to regain employment from out of the labour force, although this effect is likely to be connected with the secondary-primary division of female employment. Female discouraged workers are again more likely to enter unemployment than employment. If discouragement is the result of a decline in the perceived re-employment probability then it is conceivable there will be an accompanying attrition of job search skills. The loss of informational flows and contacts will make it harder to locate job offers upon resumption of participation. The positive coefficients on the NU flow of discouraged workers emphasise the ambiguity of labour force status for this group. A large part of this flow may be attributable to measurement error. Unemployed re-entrants differ only from the unemployed in general in their subjective estimates of labour force returns.

The longer a male spends out of the labour force the more difficult

it is to gain employment. Whether this observation is due to duration dependence or sorting cannot be determined here. Women experience the opposite circumstances. The longer the time spent outside the labour force, the greater the chance of re-employment and the lower the likelihood of unemployment entry. The high unemployment inflows of those women with only short spells outside the labour force is consistent with the Clark and Summer's notion of a temporary suspension in job search activities. The high employment inflows probably capture the movement of women back into the labour force after time spent looking after children. Interestingly, the presence of dependent children encourages rather than impedes female participation. We were unable to detect any deterrent effect of younger children by disaggregating this variable into age categories. The increased availability of part-time work may facilitate this flow. The need for additional household income may stimulate the transition.

The effect of demographic variables is generally as expected. Young workers flow largely into employment and older workers tend to refrain from participation. These results confirm the gross flows of Table 5.2. Yet we saw in Table 5.3 that much teenage unemployment was caused by an inability to find work upon labour force entry. What Table 5.7 shows is that those teenagers with *some* work experience face the greatest barriers to employment entry, particularly if they were made redundant or dismissed. Unsuccessful job experiences scar workers relative to labour force newcomers. The more educated the individual, the higher the chance of flowing into employment rather than unemployment. The presence of a working spouse significantly raises the likelihood of observing a direct transition from outside the labour force into employment over the year. As in Table 5.5, the enhanced flow of labour

market information from a working household member appears to increase the probability of contacting a job offer. Those households with unemployed or inactive spouses therefore face an informational disadvantage. In addition, the potential for benefit loss of an unemployed partner appears to discourage participation. Most NE flows are from individuals with employed spouses.

With regard to local economic conditions, we find only a significant effect of vacancies on male inflow rates. In general, individuals living in high vacancy areas face a higher probability of receiving a job offer, and are more likely to enter the labour force with employment.

5.2.5 Estimated Impact on Labour Force Flows

Finally, in Table 5.8, we present some representative transition probabilities, for various demographic groups, based upon our results in Tables 5.5 to 5.7. The predicted probabilities emphasise the diversity of escape rates according to personal and state characteristics. For example, an unemployed, unskilled male aged between fifty and sixty-four, living in council accommodation seeking work for over two years after being laid off from his previous employment, claiming benefit but using only minimal search effort (row 4) is ten times less likely to obtain employment over the year then a prime age married woman living in owner-occupied housing who left her previous job voluntarily, not claiming unemployment benefit but using several search methods (row 7). (The former are also 55 per cent more likely to withdraw from the labour force.) Row 2 indicates that short unemployment durations still effect some influence on increasing the likelihood of successful job search and row 7 emphasises the beneficial effects of increased search

intensity. Row 5 confirms that a 10 per cent increase in the wage offer distribution has a marginal effect on labour force retention.

Row 9 shows the estimated transition probabilities for a typical employed male. The likelihood of an employment separation over the year is just 9 per cent and the individual is three and a half times more likely to continue searching for work than to withdraw from the labour force. The probability of an employment separation falls with increased education, skill and owner-occupied housing tenure, to a little over 1 per cent (row 10). A 10 per cent rise in the wage distribution trebles the likelihood of an employment separation (row 12). The chances of an employment separation ending in labour force withdrawal appear higher for women than men (rows 13 to 15). The continuity of an employment spell for most groups is apparent. The likelihood of an employment interruption being higher for the young and unskilled would be supportive of a segmented labour market hypothesis.

The probability of successful labour force entry is higher for mature women and teenagers, and those who left their previous jobs voluntarily (rows 16 to 22). Note the differential employment probabilities of inexperienced and experienced teenagers (rows 19 to 20). The scarring effect more than halves the employment probability. Discouraged males do not sever their connections with the labour force entirely. The probability of a typical discouraged worker re-entering the labour force within the year is high (91 per cent), despite the relatively low probability of gaining employment in the short term.

5.5 Conclusion

Having recognised that the labour market is shaped by large flows between states, it becomes important to try and measure these movements, particularly at the micro level where information is most scarce. A thorough knowledge of individual transitions facilitates a more complete understanding of the labour market. It is apparent from this chapter that individuals differ in their propensities to experience specific states. This study has attempted to highlight some possible explanations of these differences, within a general Markovian analysis of turnover.

We model labour market dynamics from a large disaggregated data-set not specifically designed for that purpose. We estimated gross and individual annual probabilities of transition between labour market states. In the period 1983-84, 50 per cent of those unemployed in 1983 were no longer in that state one year later. With an unemployment stock of 2.9 million[15], this represents a change of circumstance of around 1.4 million individuals. Given similar sized estimated movements out of employment and inactivity, the implication is that over 4 million individuals can be expected to change labour market states within a year. It is clear from Table 5.2 that the probability of transition varies substantially across demographic groups. This chapter has endeavoured to further identify the more mobile members of the population of working age.

Analysis of the gross flow data enabled us to assess the impact of estimated flow probabilities on the unemployment, employment and inactivity rates of several heterogeneous demographic groups. We contrasted the labour market experiences of prime age males with the

rest of the population. The unemployment of the former is largely due to employment severance and subsequent difficulties in regaining work. Teenage and much female unemployment is caused by an inability to find work on labour force entry. In order to understand within-group heterogeneity, we examined individual transition probabilities. Table 5.8 summarises many of our results.

We were able to find a number of coefficients that conformed to our prior expectations, in particular, the importance of state spell duration in determining employment transitions. Increased length of spell will reduce the likelihood of transition if employed. This is consistent with firm-specific capital and job matching hypotheses of employee turnover. We are however unable to say whether this observation is due to true state dependence or unobserved heterogeneity. In contrast, unemployed and participatory flows are dominated by the individual's characteristics and environment rather than the experience of a specific state. Thus for example, unemployed workers laid off from their previous job are more likely to regain employment. Worker discouragement appears to be only a temporary phenomenon. The impact of identical personal characteristics often differs between the sexes.

The experience of any state or condition will shape the individual opportunity or preference sets which in turn influence the probability of transition. We have shown the importance of many human-capital and search theoretic variables in explaining observed transitions, notably the effect of on-the-job search and increased search effort, examined in chapters 3 and 4, in facilitating employment termination and accession respectively.

Our analysis is however constrained according to the nature of the data set at our disposal. Since we have only two observations on the

same individual taken one year apart, it would be inappropriate to model the instantaneous rate of labour market transition from a discrete data set that does not contain an exact record of labour market histories. In modelling the annual probability of transition therefore, we must be aware that our results could be affected by the interactions of the effects of the explanatory variables on the various transition rates. Secondly, there are potential biases arising form the construction of our data, namely issues of censorship and reporting errors, which may be important. Thirdly, our results may be sample and period specific.

This study is by definition supply-side in nature. Whilst undoubtedly the major factor in labour force entry and exit, the role of demand in helping determine employment inflows and outflows is also a matter worthy of further consideration.

Footnotes

1. This assumes a correlation between the LFS and UK registration definitions of unemployment. A restriction on benefit qualification may deter individuals from expressing availability for work in the survey definition of unemployment.

2. At the time of construction, the 1983 and 1984 surveys were the latest available. The method is of course applicable to any consecutive pair of surveys from 1983 onward. In future work we hope to repeat the exercise over a period with a different level of aggregate unemployment.

3. Evidence from the 1984 LFS indicates that some 11 per cent of the population of working age are excluded in this way.

    The selectivity problem restricts our estimation of the annual probability of a state transition to be conditional on there being no accompanying residential movement. Using Bayes law

$$Pr[\text{Change State}] = \frac{Pr[\text{Change State and No Move}]}{Pr[\text{No Move/Change State}]}$$

Our dataset does not contain sufficient information to estimate either the denominator or the numerator. It has proved difficult to devise a technique to circumvent this problem.

4. Give n states there are only (n-1) possible unique transition probabilities in an equilibrium. But in general there are n(n-1) unique transition probabilities outside a steady state, (Tuma and Hannan (1979)). Table 5.2 offers some confirmation that the latter situation holds.

5. The relevant test statistic is

$$\sum_{i=1}^{3} = \frac{[Oi-Ei]^2}{Ei} \sim X^2 (k-1) \qquad k=1,2,3$$

where Ei are the "true" LFS state proportions and Oi are the matched sub-sample proportions.

6. It follows that any flow, Fij = Si x Pij.

7. The relevant flow numbers are EU=173, EN=163, UE=157, UN=116, NE=276 and NU=181.

8. There are 25 categories of economic activity when using actual responses and only nine groups in the retrospective data. For example, the recall data asks only whether the individual was unemployed one year ago. The true unemployed status incorporates five categories – actively seeking work, waiting to start work, temporarily sick, on holiday and awaiting results of a job application.

9. The small sample numbers involved prevent us from identifying separately the flows into discouragement in Tables 5.2, 5.3 and 5.4.

10. We exclude attendance at a government job centre from the list of potential job search methods since this is likely to be highly correlated with receipt of unemployment benefit. See chapter 4.

11. In the male regression for example, just forty-eight people made the transition into employment. Pooling the male and female sample results in theoretically consistent wage coefficients (positive into employment, negative out of the labour force) but inconsistently signed vacancy and unemployment effects. None of the coefficients are significant.

12. Evidence from the 1984 Labour Force Survey indicates that some 75 per cent of small establishments are located in the service industries and that a majority of employees are white collar.

13. In 1983-84, male flows into unemployment were dominated by layoffs in the ratio 60:40, female flows were comprised in the ratio 45:55. The corresponding flows out of the labour force were 25:75 (males), 18:82 (females).

14. The manual status dummy controls for occupation effects. The nominal wage variable is therefore essentially a "south-east" effect. We also experimented with a "real wage" variable, constructed by deflating nominal earnings by regional mean house price data. The results were not significantly different to warrant separate reporting.

15. 1983 LFS estimate.

Appendix A5

Information on individual socio-economic characteristics is taken from a matched sample of participants in the 1983 and 1984 Labour Force Surveys. The raw unmatched data was supplied to us by the UK Office of Population Census and Survey and the ESRC Data Archive. We restrict our analysis to the population of working age, resident in England and Wales. All variables refer to the individual's circumstances in the Spring of 1983.

AGE	= 1 if individual falls within either 16-19, 20-24 or 50-retirment age categories, 0 otherwise.
DEGREE	= 1 if individuals highest qualification is degree or equivalent, 0 otherwise.
GCE	= 1 if highest qualification is 'A' or 'O' level or equivalent, 0 otherwise.
OTHER	= 1 if individuals hold any other qualification, 0 otherwise.
SINGLE	= 1 if single, divorced or separated, 0 otherwise.
SPOUSE	= 1 if husband or wife currently employed, 0 otherwise.
DEPENDENT CHILDREN	= 1 if resident in a household with children under the age of sixteen, 0 otherwise.
COUNCIL TENANT	= 1 if living in local authority accommodation, 0 otherwise.
TENURE	= 1 if length of current employment with firm falls within specified range, 0 otherwise.

SMALL   = 1 if current workplace has fewer than twenty-five

                          employees, 0 otherwise.

TEMPORARY WORK   = 1 if current job seasonal, temporary, casual or

                          fixed period, 0 otherwise.

PART-TIME   = 1 if job assessed to be part-time, 0 otherwise.

MANUAL   = 1 if job categorised as skilled or unskilled manual

                          or general labourer, 0 otherwise.

SEARCHING   = 1 if individual looking for new or additional

                          employment, 0 otherwise.

WORK EXPERIENCE   = 1 if individual has worked previously, 0 otherwise.

LAID OFF   = 1 if individual made redundant, dismissed or

                          temporary job ended,0 otherwise.

DURATION   = 1 if individual seeking work within specified

                          range, 0 otherwise.

BENEFIT CLAIMANT   = 1 if individual claiming unemployment benefit,

                          supplementary allowance or a National Insurance

                          credit, 0 otherwise.

LEFT   = 1 if individual last worked within specified range,

                          0 otherwise.

DISCOURAGED   = 1 if individual reports reason for inactivity as

                          belief that no jobs are currently available.

SEARCH EFFORT   = Number of reported methods of job search utilised

                          by an unemployed worker in survey   reference

                          week.

In addition we have supplemented our data set with information from
the following sources:

(a) Vacancies.

Regional vacancies expressed as a percentage of employees in employment. Source: Department of Employment Gazette, Table 3.6.

(b) Employment.

All employees in employment disaggregated by region. Source: Regional Trends (Central Statistical Office), Table 8.1.

(c) Unemployment.

Aggregate area unemployment rate, disaggregated to metropolitan county level. Source: Department of Employment Gazette, Table 2.9.

(d) Wages

Average hourly earnings of men and women, disaggregated to metropolitan county level (and by manual/non-manual if employed). Source: Department of Employment New Earnings Survey (1983), Part E, Tables 122-123.

Table 5.1

Comparison of Labour Force Composition, 1983-84

	Employed	Unemployed	Out of Labour Force
Labour Force Survey			
1983	64.1	7.7	28.2
1984	67.3	8.4	24.3
Matched Sample			
1983	66.5	7.3	26.2
1984	67.8	8.4	23.8

Note: The 1983 LFS contains 123,365 individuals; the 1984 LFS contains 80,515 individuals. There are 7,172 individuals in our panel. All figures relate to population of working age.

Table 5.2. Annual Labour Market Transition Probabilities by Sex and Age, 1983-84

Sex and Age	Probability of Transition								
	EE	EU	EN	UE	UU	UN	NE	NU	NN
	1.	2.	3.	4.	5.	6.	7.	8.	9.
1) *Total*	.930	.036	.034	.284	.507	.209	.151	.086	.764
Males									
2) Total	.948	.033	.019	.235	.603	.161	.141	.099	.760
3) 16-19 years	.937	.047	.016	.512	.390	.098	.259	.075	.667
4) 20-49 years	.958	.033	.009	.225	.689	.086	.117	.245	.638
5) 50-64 years	.924	.031	.045	.133	.489	.378	.038	.057	.905
Females									
6) Total	.902	.040	.057	.387	.304	.309	.154	.081	.765
7) 16-19 years	.886	.072	.044	.500	.267	.233	.275	.087	.638
8) 20-49 years	.904	.040	.056	.385	.303	.312	.150	.093	.756
9) 50-59 years	.900	.033	.067	.188	.375	.438	.065	.035	.900

Note: The probability ij represents the likelihood that an individual will flow from state i to state j. E = employment, U = unemployment, N = out of the labour force. First letter signifies status in 1983. Sample size = 7,172 of which in 1983 there were 4,793 employed, 554 unemployed and 1,825 non-participants.

Table 5.3   Annual Labour Force Flow Ratios using Actual and Retrospective Data

Sex and Age	EE	EU	EN	UE	UU	UN	NE	NU	NN	Sample Size
1) Total	0.987	1.065	1.250	1.013	0.873	1.554	1.213	1.203	0.944	7,122
Males										
2) Total	0.997	0.971	1.061	0.885	0.907	1.311	1.322	1.788	0.948	3,718
3) 16-19 years	0.915	0.667	0.667	0.846	1.000	2.000	1.341	1.273	0.987	320
4) 20-49 years	1.001	1.015	1.115	0.911	0.914	1.000	1.167	1.824	0.953	2,340
5) 50-64 years	0.997	0.960	1.086	0.857	0.846	1.522	1.800	2.800	0.927	1,053
Females										
6) Total	0.974	1.212	1.397	1.228	0.754	1.931	1.176	1.027	0.943	3,404
7) 16-19 years	0.945	0.900	0.833	1.143	0.643	2.333	1.083	1.500	0.961	293
8) 20-49 years	0.975	1.341	1.441	1.378	0.804	2.222	1.154	0.935	0.933	2,489
9) 50-59 years	0.977	0.917	1.444	0.500	0.667	1.125	2.000	1.800	0.963	618

Note: E = Employed   U = Unemployed   N = Not in labour force.   First letter signifies status in 1983.

Table 5.4 Characteristics of Annual Labour Market Flows, 1983-84

Sex and Age	Proportion of Flows				
	1. into employment from outside the labour force (fne/fne + fue)	2. out of labour force from employment (fen/fen + feu)	3. into unemployment from employment (feu/feu + fnu)	4. out of labour force from unemployment (fun/fun + fen)	5. into unemp. from outside labour force (fnu/fnu + fne)
Total	.655	.486	.515	.424	.364
Males					
Total	.462	.366	.652	.406	.413
16-19 years	.713	.250	.284	.160	.140
20-49 years	.180	.217	.739	.514	.676
50-64 years	.400	.589	.657	.507	.600
Females					
Total	.762	.588	.406	.325	.344
16-19 years	.800	.379	.301	.583	.207
20-49 years	.737	.587	.410	.319	.383
50-59 years	.850	.666	.550	.241	.346

Note: fij represents the number of individuals moving from state i to state j over the period.

E = employment, U = unemployment, N = out of the labour force.

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Table 5.5 Annual Transitions from Unemployment

	Sample Mean		U-E		U-N	
	Males	Females	Males	Females	Males	Females
Constant			-11.47	5.62	18.76	3.44
			(15.56)	(17.25)	(17.49)	(18.22)
Age: 16-19	0.12	0.18	0.94**	0.18	-0.01	0.70
			(0.41)	(0.51)	(0.55)	(0.57)
: 20-24	0.17	0.15	0.11	-0.05	-0.13	0.62
			(0.36)	(0.40)	(0.45)	(0.42)
: 50-Retirement	0.25	0.11	-0.93**	-0.68	1.27**	-1.02**
			(0.33)	(0.55)	(0.35)	(0.49)
Education: Degree	0.04	0.07	-0.72	-0.28	1.29**	0.17
			(0.54)	(0.54)	(0.54)	(0.54)
: GCE	0.18	0.29	0.68**	-0.12	-0.69*	0.06
			(0.30)	(0.32)	(0.39)	(0.33)
: Other	0.15	0.14	0.63*	0.31	-0.77*	0.16
			(0.31)	(0.38)	(0.43)	(0.44)
Single	0.42	0.47	0.21	-0.28	-0.14	-0.61
			(0.29)	(0.33)	(0.34)	(0.49)
Working Spouse	0.16	0.43	1.64**	1.26**	-1.42**	-1.09**
			(0.34)	(0.49)	(0.47)	(0.48)
Dependent Children	0.47	0.58	-0.02	-0.11	-0.15	0.55
			(0.24)	(0.29)	(0.31)	(0.34)
Council Tenant	0.41	0.27	-0.43*	0.09	-0.02	-0.70**
			(0.23)	(0.31)	(0.28)	(0.35)
Work Experience	0.92	0.87	-0.07	-0.79*	0.84	1.04*
			(0.24)	(0.48)	(0.55)	(0.55)
: Laid off	0.53	0.27	0.70**	1.02**	-1.08**	-0.80
			(0.24)	(0.32)	(0.28)	(0.39)
Unemployment Duration						
: < 3 months	0.11	0.27	0.47	0.29	-0.65	-0.35
			(0.36)	(0.44)	(0.45)	(0.42)
: 3 months-1 year	0.27	0.42	0.23	0.63	-0.18	-0.56
			(0.28)	(0.42)	(0.34)	(0.38)
: 1-2 years	0.25	0.13	-0.10	0.88*	-0.10	-1.47**
			(0.30)	(0.54)	(0.34)	(0.57)
Benefit Claimant	0.94	0.58	0.15	-0.09	-0.40	-0.45
			(0.41)	(0.28)	(0.43)	(0.30)
Search Intensity	1.53	1.32	0.32**	0.14	-0.59**	-0.08
			(0.13)	(0.15)	(0.16)	(0.16)
Local Economic Conditions						
: Vacancy Rate	-0.60	-0.60	1.09	-0.85	-0.41	0.27
			(1.27)	(1.46)	(0.89)	(0.84)
: Wage Rate	5.93	5.59	2.52	-1.07	-3.08	0.06
			(1.91)	(1.84)	(2.10)	(1.91)
: Unemp.Rate	-1.95	-2.01	0.94	-1.11	-1.13	0.14
			(0.60)	(0.72)	(0.71)	(0.74)

Table 5.5 (cont.)

Diagnostics	Males		Females	
	At Zero	At Convergence	At Zero	At Convergence
Log L	-407.6	-263.4	-198.8	-164.4
Degrees of freedom	742	700	362	324
% correct predictions	33.0	66.9	33.0	53.6
Sample size	371		181	

Note: Standard errors in parenthesis - ** denotes significant at 95% level
* denotes significant at 90% level. Likelihood Ratio test for
male-female sample split, LR = 51.0 ~ $X^2(40)$. Sample flow sizes are
UU=224, UE=88, UN=59 for men and UU=54, UE=71 and UN=58 for women.

Table 5.6

Annual Transitions from Employment

	Sample Mean		E-U		E-N	
	Males	Females	Males	Females	Males	Females
Constant			-28.42**	-8.11	8.34	13.12
			(11.12)	(10.35)	(13.29)	(8.42)
Age: 16-19	0.04	0.06	0.03	0.49	-0.32	-0.36
			(0.46)	(0.43)	(0.58)	(0.54)
: 20-24	0.09	0.13	1.03**	0.01	-1.48**	0.36
			(0.41)	(0.28)	(0.71)	(0.25)
: 50-Retirement	0.26	0.19	-0.13	-0.37	0.42*	0.60**
			(0.22)	(0.28)	(0.23)	(0.21)
Education: Degree	0.17	0.09	-0.82**	-0.02	0.51	0.06
			(0.36)	(0.37)	(0.34)	(0.32)
: GCE	0.30	0.34	-0.39*	-0.06	0.39	0.07
			(0.22)	(0.24)	(0.24)	(0.20)
: Other	0.10	0.12	-0.13	-0.08	-0.01	0.41*
			(0.27)	(0.26)	(0.32)	(0.22)
Single	0.20	0.29	0.01	0.14	0.14	-0.56**
			(0.24)	(0.23)	(0.24)	(0.21)
Dependent Children	0.53	0.49	0.49**	-0.17	-0.74**	0.02
			(0.20)	(0.21)	(0.23)	(0.18)
Council Tenant	0.17	0.15	0.44**	0.46**	0.02	0.41**
			(0.19)	(0.22)	(0.23)	(0.22)
Job Characteristics						
: Tenure < 6 mths	0.04	0.08	0.75**	0.51	-0.19	-0.04
			(0.34)	(0.35)	(0.46)	(0.29)
: Tenure 6mths-2yrs	0.11	0.19	0.63**	0.42	-0.32	-0.20
			(0.27)	(0.31)	(0.33)	(0.24)
: Tenure 2-10yrs	0.36	0.49	0.32	0.47*	-0.41*	-0.48**
			(0.21)	(0.27)	(0.23)	(0.20)
: Small Firm	0.26	0.43	0.19	-0.08	-0.43*	0.11
			(0.20)	(0.18)	(0.25)	(0.15)
: Temporary Work	0.02	0.06	1.07**	0.47*	-0.78	0.04
			(0.40)	(0.26)	(0.62)	(0.23)
: Part-Time	0.01	0.43	-0.46	-0.09	1.29**	0.29*
			(0.54)	(0.21)	(0.54)	(0.17)
: Manual	0.56	0.35	0.92	0.09	-0.17	0.17
			(0.62)	(0.45)	(0.69)	(0.40)
: Searching on Job	0.04	0.05	0.73*	1.05**	-0.90	-1.14**
			(0.43)	(0.27)	(0.71)	(0.29)
Local Economic Conditions						
: Vacancy Rate	-0.57	-0.57	0.26	-0.59	-0.42	0.17
			(0.57)	(0.61)	(0.61)	(0.52)
: Wage Rate	5.94	5.53	2.62*	-0.30	-0.96	1.08
			(1.44)	(1.31)	(1.57)	(1.21)
: Unemp.Rate	-2.04	-2.04	0.52	-0.38	-0.27	0.31
			(0.43)	(0.44)	(0.44)	(0.43)

Table 5.6 (cont.)

Diagnostics	Males		Females	
	At Zero	At Convergence	At Zero	At Convergence
Log L	-3127	-669.2	-2087	-714.5
Degrees of freedom	5688	5650	3826	3758
% correct predictions	33.3	94.1	33.3	89.4
Sample size	2846		1900	

Note: Standard errors in parenthesis - ** denotes significant at 95% level
* denotes significant at 90% level. Likelihood Ratio test for male-female sample split, LR = 57.0 ~ $X^2(42)$. Sample flow sizes are EE=2679, EU=98, EN=69 for men and EE=1700, EU=76 and EN=124 for women

Table 5.7

Annual Transitions from Outside Labour Force

	Sample Mean		N-E		N-U	
	Males	Females	Males	Females	Males	Females
Constant			8.82	4.31	-10.99	9.51
			(14.44)	(6.14)	(14.72)	(9.27)
Age: 16-19	0.32	0.11	0.82*	0.56**	-0.69	-0.02
			(0.42)	(0.23)	(0.41)	(0.28)
: 20-24	0.05	0.10	0.52	-0.30	-0.19	0.28
			(0.57)	(0.22)	(0.51)	(0.21)
: 50-Retirement	0.46	0.23	-0.11	0.06	-0.85**	-0.82**
			(0.38)	(0.24)	(0.36)	(0.29)
Education: Degree	0.06	0.05	0.40	0.58**	-0.15	0.20
			(0.47)	(0.27)	(0.42)	(0.29)
: GCE	0.23	0.28	0.15	-0.28	-0.13	-0.45
			(0.54)	(0.27)	(0.59)	(0.42)
: Other	0.09	0.11	-0.02	-0.16	-0.06	0.39**
			(0.24)	(0.14)	(0.29)	(0.16)
Single	0.56	0.26	0.77*	0.26	-0.33	0.22
			(0.43)	(0.27)	(0.37)	(0.29)
Working Spouse	0.14	0.59	0.87*	0.58**	-0.75*	-0.02
			(0.45)	(0.24)	(0.41)	(0.24)
Dependent Children	0.46	0.72	0.52	0.41**	-0.06	-0.58**
			(0.35)	(0.18)	(0.34)	(0.19)
Council Tenant	0.32	0.24	0.08	-0.48**	0.61**	0.59**
			(0.23)	(0.16)	(0.24)	(0.17)
Work Experience	0.75	0.84	-1.29**	0.35	0.97*	-0.12
			(0.54)	(0.27)	(0.40)	(0.29)
: left < 1 yr ago	0.15	0.11	0.87*	-0.03	-0.05	0.90**
			(0.52)	(0.25)	(0.47)	(0.25)
: left 1-3 yrs ago	0.22	0.13	0.23	-0.19	-0.07	0.68**
			(0.52)	(0.44)	(0.47)	(0.24)
: Laid off	0.12	0.04	-0.81	-1.03**	0.92*	0.70**
			(0.57)	(0.27)	(0.50)	(0.30)
Discouraged Worker	0.09	0.03	-0.25	-0.45**	0.62*	0.19
			(0.28)	(0.18)	(0.36)	(0.23)
Local Economic Conditions						
: Vacancy Rate	-0.56	-0.56	1.37**	-0.07	-2.16*	0.04
			(0.68)	(0.39)	(0.77)	(0.47)
: Wage Rate	5.94	5.58	-1.71	-0.22	1.39	-0.91
			(1.74)	(0.99)	(1.81)	(1.16)
: Unemp.Rate	-2.03	-2.03	0.04	-0.02	-0.07	0.41
			(0.65)	(0.34)	(0.71)	(0.40)

Table 5.7 (cont.)

Diagnostics	Males		Females	
	At Zero	At Convergence	At Zero	At Convergence
Log L	-517.4	-296.0	-1488	-864.5
Degrees of freedom	942	904	2708	2670
% correct predictions	33.0	73.3	33.0	75.6
Sample size	471		1354	

Note: Standard errors in parenthesis – ** denotes significant at 95% level
* denotes significant at 90% level. Likelihood Ratio test for male-female sample split, LR = 72.0 ~ $X^2(36)$. Sample flow sizes are NN=330, NE=82, NU=59 for men and NN=1021, NE=221 and NU=112 for women

Table 5.8

Predicted Transition Probabilities

Description of Origin State	Predicted Probability	

A. Unemployment	U-E	U-N
1. Prime-age married man, no qualification, council house, children. Seeking work between 3 months and 1 year, laid off, claiming benefit, average search intensity.	0.20	0.01
2. As 1. but duration over 2 years.	0.14	0.04
3. As 1. but owner occupier, duration < 3 months, using 3 search methods.	0.44	0.02
4. As 1. but local wage rate 10% above average.	0.18	0.02
5. As 1. but local wage rate 10% above average.	0.18	0.02
6. Prime-age married woman, owner occupier, children. Quit last job and claiming benefit duration 3-12 months, average search intensity.	0.43	0.44
7. As 6. but using 3 search methods.	0.52	0.34
8. As 6 but teenage, single, no work experience, claiming benefit.	0.31	0.25

B. Employment	E-U	E-N
9. Prime-age male, some qualifications, married, children, council house, manual, large firm, full time, tenure > 10 years, not searching on job.	0.07	0.02
10. As 9. but non-manual, owner-occupied, degree.	0.003	0.008

Table 5.8 (cont.)

Description of Origin State	Predicted Probability	

11. As 9. but young, single, small firm,

    tenure < 6 months, searching on job.   0.49   0.001

12. As 9. but living in area with wages 10

    above average.   0.27   0.02

13. As 9. but female.   0.03   0.13

14· Prime-age female, some qualifications,

    children. Non-manual part-time,

    small firm. Tenure 6 months-2 years.   0.03   0.13

15. As 14. but degree, full-time, large firm.

    Tenure 2-10 years. Searching on job.

    Single.   0.02   0.01

C. Outside Labour Force   N-E   N-U

16. Prime-age married man, no qualifications,

    children, council house. Laid off over

    3 years ago. Discouraged.   0.01   0.91

17. Teenage, single male. No work experience.

    No dependents. Some qualifications.   0.27   0.10

18. As 16. but job quit.   0.11   0.76

19. As 16. but vacancy rate 10% above average.   0.02   0.88

20. Prime-age married female, some qualifications,

    children, owner occupier. Previous job ended

    in quit over 3 years ago.   0.25   0.06

21. As 20. but left 1-3 years ago.   0.30   0.21

Chapter 6: Job Tenure and Inter-Firm Mobility in Britain

6.1. Introduction

Each year in Britain between ten to fifteen per cent of the working population, i.e some 2 to 3 million people, separate from their jobs. Many workers flow directly into unemployment, others withdraw from the labour force and still more, around 50 per cent, begin work with a new employer. Labour turnover is a necessary means by which to allocate human resources efficiently. Most workers in Britain hold long-term productive jobs. The movement of workers across firms facilitates this flow into long term employment. Workers unhappy with their current circumstances can engage in mobility as a means of improving their worth. Chapter 3 examined the first stage of this process - the decision to undertake on-the-job search. Here we seek to identify which workers are ultimately successful in their attempts to move. This chapter uses cross sectional and longitudinal observations of individuals to explore the incidence of inter-firm mobility in Britain, the determinants of a worker's likelihood of changing jobs and the process of job shopping.

Several studies in the United States have analysed inter-firm mobility using individual micro data. Bartel (1982) examined the effect of non-pecuniary characteristics on mobility. Mincer and Jovanovic (1981) concentrated upon the negative relationship between job tenure and the probability of a transition. Akerlof, Rose and Yellen (1988) investigated the pro-cyclical nature of job quits. Hitherto, United Kingdom studies of turnover (see Burgess and Nickell (1987), Shorey (1980) and Wickens (1978)) have used industry-level data specific to the manufacturing sector to analyse job separations, in part for want of an

alternative dataset. Our analysis of UK individual mobility draws upon the information contained in the Labour Force Survey (LFS). In order to study differences in mobility behaviour, we make use of the dynamic information contained in the two period longitudinal dataset constructed from the 1983 and 1984 LFS used to analyse labour market transitions in chapter 5.

Following a technique developed by Hall (1982), we use LFS information on uncompleted job tenure to estimate a worker's "eventual tenure" and so infer the likely process of job shopping. Our approach embodies search theoretic, human capital and job matching considerations of labour mobility. In this way workers and firms form matches, the value of which may evolve over time if the worker invests in firm specific capital, or new information arrives to change the relative value of any job match. The individual decision to change jobs is based on information acquisition as measured by the characteristics of the job, both wage and non-pecuniary, some of which may be observed only after a match takes place. External economic conditions should also influence the ability of workers to change jobs.

In the following study we test these propositions empirically and assess the implications for the job shopping process. Of particular importance throughout this chapter, is the relationship between time spent with the firm and mobility. Since we consider lengthy job tenure as evidence of a successful job match, we concentrate upon the flow into long term jobs. Section 6.2 outlines the theoretical background to our work and Section 6.3 describes aspects of the dataset and its construction. Section 6.4 presents a series of analyses of turnover over time, by industry, occupation and tenure. High wage industries demonstrate significantly lower inter-firm mobility. We present logistic

regression results of the likelihood that a worker will change jobs within the course of a year which confirm the existence of an inverse tenure-turnover relationship in Britain. We find evidence that long term employment relationships comprise the majority of British employment experiences. The average male employee is currently in a job that will last 15 years. Women hold jobs on average for around seven years. This reflects their segmented labour market participation. Over the working horizon women can be expected to hold around 2 more jobs than men. Section 6.5 concludes to the effect that the ability to engage in job shopping and efficiency enhancing inter-firm mobility may be limited by high levels of unemployment.

6.2. Theoretical Background

We seek to explain the movement of workers across firms as a means of increasing the personal returns to employment. Owing to the nature of our dataset, we do not exclude the possibility of an intervening unemployment spell. We therefore attempt to identify those workers who successfully changed jobs over a one year interval. These movements incorporate both worker initiated quits and firm inspired layoff behaviour. In other words, we measure aggregate turnover.

The recognition that labour turnover would result from the optimising decisions of firms and workers first appears in the works of Becker (1962) and Oi (1962). The theory of human capital embodied in these studies views workers as seeking to maximise lifetime income. In its simplest form, the theory predicts that workers will change jobs if by so doing they increase expected lifetime rewards, net of any

transaction costs. Yet firms are not passive agents in this process. Both Becker and Oi realised that investments made by workers and firms during the course of a job would affect the value of the job match and that this could subsequently influence labour turnover.

In particular the provision of training programmes specific to the needs of an individual firm was seen as likely to reduce turnover, since their existence created an economic rent which both firm and worker could exploit if the job match was maintained. Firms gain from specific training if as a result, a worker's productivity is raised above that which would have occured without training. Likewise a worker will benefit should he/she be able to capture some of the returns from the increase in productivity. Firm specific, as opposed to general training, leaves a worker's productivity, and hence worth, in alternative employment unchanged. It is therefore in a worker's interest to remain with a firm providing such training. The greater the volume of investment undertaken by firms or workers, the greater the cost of a job separation.

Parsons (1972) demonstrates that the size of worker and firm job investment will be reflected in quit and layoff behaviour respectively. Firms are less likely to layoff those workers in whom they have invested heavily for at least two reasons. Firstly, such workers will be endowed with the highest marginal product value and be most experienced with the firm's means of production. Secondly, the hiring and firing costs of these highly skilled workers will be correspondingly larger. Similarly, workers receiving a higher reward than obtainable elsewhere due to specific training, will be less likely to quit. The existence of worker search and transfer costs will also serve to raise the value of an existing job match and reduce quits accordingly. If workers share the

cost of training by receiving lower current rewards coupled with a higher return upon completion of training, then once again the incentive to quit is reduced.

Parsons, among others, reports a strong empirical inverse relationship between turnover and job tenure. This issue is pursued by Jovanovic (1979a, 1979b) who offers two possible explanations for this observation. The first, (contained in Jovanovic (1979b)), belongs to the 'inspection-good' theory of turnover with which the Parsons study is also associated. Here workers are assumed to posess information regarding current but not alternative job matches. The rewards from a job are directly related to match-specific marginal productivities. Over time workers acquire information regarding the quality of alternative job offers whilst at the same time being free to invest in firm-specific capital on the current job. Hence the observed turnover-tenure relation. The more specific capital investment undertaken, and hence the more time spent on the job, the higher the productivity (and reward) in the current job and the less likely an alternative job will offer a higher match-specific productivity.

The alternative explanation for the inverse turnover-tenure relationship offered by Jovanovic (1979a), Wilde (1979) and Johnson (1978), belongs to the 'experience-good' theory of turnover. Here workers possess imperfect information regarding the quality of any job match. This informational uncertainty can only be reduced by a period of time spent on the job. Over time, characteristics regarding the job or the worker's productivity on the job are gradually revealed. Workers terminate matches in which their productivity or worth is deemed to be low. Since a mismatch is likely to be detected during the early stages of the job, so the inverse turnover-tenure observation is derived.

Inter-firm mobility in this context is a means by which to engage in 'job shopping' for new potentially more productive and rewarding job matches. Workers and firms could be expected to sample a succession of jobs for short periods until a productive match is eventually revealed and a long-term employment relationship begins. That the productivity of a job is dependent upon each worker-firm pairing is sufficient to create a distribution of returns and individual differences in the tenure-turnover relation. Neither hypothesis directly addresses the problem of firm initiated separations. If however firms layoff those workers with the least amount of specific human capital or terminate less productive job matches, then we would expect to observe a similar tenure-separation relationship. It will also be difficult to distinguish empirically between the experience and inspection explanations of the tenure effect. In practice we might expect elements of both hypotheses to be present. We now consider other possible determinants of inter-firm mobility.

Akerlof, Rose and Yellen (1988) have recently applied an inspection-good model of turnover to address the observation that voluntary job separations in the United States are highly pro-cyclical. The authors assume the existence of job rationing, i.e. firms set wages above market clearing levels, which creates competition for job vacancies. The greater the competition, as measured by an increase in the unemployment rate, the harder it becomes to change jobs and turnover subsequently falls. In good times the likelihood that a vacancy will be filled by an employed worker is much higher, hence the pro-cyclical nature of inter-firm mobility. A similar argument is advanced in Burgess and Nickell (1987). In their analysis of aggregate turnover (quits plus layoffs) the authors note that job-to-job quits will vary

with job availability. A firm's layoff behaviour is then determined by the difference between total quits and planned employment levels. Thus in any empirical study of inter-firm mobility we would expect to observe a positive coefficient on vacancies and a negative effect of unemployment.

Ball commenting on Akerlof, Rose and Yellen (1988) notes that there may be positive externalities arising from the increased number of trading opportunities that a bouyant economy provides. This stems from the work of Diamond (1982) who demonstrates that turnover is not necessarilly efficient in search based models, because workers and firms engaged in a job match ignore the impact that this has on the ability of others to form a successful pairing. A greater number of trading opportunities improves the matching of jobs and workers by lowering the cost of finding a new job. Employed workers find it easier to engage in job shopping faced with more vacancies and reduced competition. Firms also benefit from increased trading opportunities. The cost of opening a vacancy is reduced under "thick-market conditions". Firms however will be indifferent to the status of the job seeker. The firm benefits from the wider pool of potential employees that an increase in the number of job seekers will bring. Such a situation could arise equally in times of high unemployment or when employed job search is high. The results of chapter 3 suggest that on-the-job search is higher when unemployment is low. This could limit the effect of any unemployment variable in a turnover regression.[1] Search externalities created by job matching models are necessary conditions for observing such effects.[2]

Since turnover is seen as a response to the total value of a job match it is perhaps useful to examine the constituent parts of a job's total worth. To the worker, the total reward from a job is the sum of

its monetary and non-pecuniary components. In the experience good models, non-pecuniary characteristics (working environment, fringe benefits, the journey to work, for example) will be major motivating factors in the turnover decision, since the wage can always be observed before the job begins. A dissatisfied worker is more likely to generate an unproductive job match. If satisfaction or indeed non-pecuniary preferences evolve over time, as job aspects gradually reveal themselves to the worker, then turnover behaviour will respond likewise.

Several studies have endeavoured to test for the importance of non-pecuniary characteristics in explaining turnover behaviour. It has however proved difficult to measure these effects precisely in empirical work. Viscusi (1979) for example, uses both the industrial injury rate and a set of self-assessed job characteristics, (for example speed of work, physical effort required, pleasantness of working conditions), to capture non-wage effects. The author reports a positive effect of the former on industry and quit rates and significant effects of the latter on individual quit intentions. Bartel (1982), obtains significant effects on realised worker quit behaviour for a series of occupational characteristics. Akerlof, Rose and Yellen (1988), reduce the non-wage aspects of the job to a single monetary valuation. This is based upon a survey-initiated response to the subjective amount each worker must be compensated by to induce a move to a new job equivalent to the one currently held. On this basis the authors claim that non-pecuniary aspects of the job can explain around fifty per cent of all turnover decisions.

Whilst it seems doubtful that a satisfactory measure of non-wage job attributes currently exists, it does appear important to try and proxy the effect, if any, in empirical work. The approach we take follows

that of Viscusi and Bartel. Since our dataset does not contain sufficient information regarding a worker's assessment of non-wage aspects, we include industrial and occupational characteristics in our mobility regressions.[3] Further details are given in Section 6.4.

Finally, it is important that we interpret the available information on turnover correctly. If labour mobility is indeed influenced by job matching or firm-specific capital considerations, then we would expect those workers with good (poor) matches to have long (short) job tenures. This would not necessarily be apparent from an analysis of aggregate incomplete tenure spells as contained in the LFS. Workers in the midst of an employment spell may be on the point of severing that link or may have embarked upon a job that will ultimately last the remainder of their working career. If some form of job shopping behaviour does hold then one might expect short durations to be a prelude to longer, more successful matches in which both firm and worker share in the resulting higher marginal productivity. Using a technique developed by Hall (1982) it is possible to estimate the likelihood of eventual tenure length from the data on distribution of current, incomplete spells. Hence we are able to assess the contribution of long-term (productive) jobs to total employment and their relevance to the British labour market.

6.3.   Data

Our analysis of job tenure and turnover is drawn from the United Kingdom Labour Force Survey (LFS), an annual survey of around 60,000 private households. Each year the LFS questions those currently in work

as to whether they were employed by a different firm one year previously. We utilise the information contained in these responses as the basis for our investigation of inter-firm mobility. No details are given as to the exact data of transition, if any. In addition from 1983 onwards, the LFS has contained information on the length of tenure of jobs currently in progress. Ordinarily it would be impossible to analyse the effect of tenure on inter-firm mobility using data from a single LFS. Since the information on tenure refers to the current employment spell, it is endogenous with respect to the turnover variable. However such an analysis is possible using the specially constructed LFS longitudinal dataset used in chapter 5. By matching the personal characteristics of individuals contained in the 1983 and 1984 surveys, we have access to around 4,500 people employed in both years (see also Wadsworth (1989) for further details). It is therefore possible to assess the effect of 1983 job tenure and other characteristics on subsequent mobility behaviour. As far as we are aware this dataset is unique. It allows us therefore to examine aspects of turnover hitherto possible using only United States data.

There are however some problems that should be noted as being particularly relevant in any analysis of turnover. Firstly, our dataset is not an entirely random sample of the population. The LFS sample overlap between successive surveys is constructed by returning to addresses and not individuals. Consequently those people who move home between survey interview dates are excluded. If there exists a correlation between household and inter-firm mobility, our turnover estimates may be prone to sample selection bias. Estimates from the full 1984 LFS suggest that some 25 per cent of job-to-job changes are accompanied by a change of address.[4] Unfortunately it has proved

difficult to devise an adequate selectivity correction technique. All our subsequent work is therefore restricted to households who remained at the same address between surveys. We therefore exclude most long distance job related moves[5] and all further inferences are tempered accordingly.

A second (lesser) problem concerns our inability to measure the exact timing or cause of any job separation. We restrict our sample to those individuals employed at both survey dates. We cannot however exclude the possibility of intervening unemployment or a spell outside the labour force between these two survey dates. Our measure of inter-firm mobility is therefore similar to that found in Mincer and Jovanovic (1981) rather than Mattilla (1974), who reports that around sixty per cent of all U.S. job changes involve no unemployment. The two concepts are highly correlated, yet because we cannot distinguish the cause of separation, our aggregate turnover measure incorporates aspects of both quit and layoff behaviour i.e. both worker and firm initiated decisions.[6]

Finally, our dataset does not contain any wage information. Since a worker's wage relative to that obtainable elsewhere partially determines the value of a job match, it is necessary to proxy this variable. We therefore include measures of the worker's occupational and industrial wage, available from an external source (see Data Appendix). As in chapter 3, the former approximates an own wage effect. The more highly paid the worker, the greater the value of the job match and the less likely a separation. The latter should capture a relative wage effect. The lower the industrial wage with respect to the available alternatives, the higher the chances of job dissatisfaction and a subsequent separation.[7] In addition we have augmented the dataset with

variables intended to measure local labour market demand and potential non-pecuniary characteristics of a job. We therefore include regional vacancy, unemployment and redundancy rates together with industrial accident incidence.

6.4.   Results

6.4.1 The Pattern of Turnover in Britain

We begin with an outline of the pattern of job separations in Britain over a seven year period, 1977-1984, using data from the 1977, 1979, 1981, 1983 and 1984 Labour Force Surveys. During this time the economy moved into recession and had begun to recover again. We categorise the annual separation rate according to whether the transition resulted in a new job, unemployment or labour force withdrawal. We are further able to distinguish whether the movement into unemployment was due to either a quit or a layoff.[8] Between 13 and 16 per cent of the employed work force separate from their jobs every year.

Table 6.1 illustrates that the incidence of aggregate separation appears to vary somewhat pro-cyclically. As aggregate conditions worsen, the proportion of separations comprising job-to-job changes falls and the flow into unemployment rises. The increased flow into unemployment is an involuntary movement, being principally attributable to a rise in layoffs. This accounted for a maximum of 72 per cent of the flow into unemployment by 1980-81, but fell back steadily to around 50 per cent thereafter. Inter-firm mobility and job quits into unemployment are highly correlated. Both these flows fell as aggregate

conditions worsened, particularly between 1977 and 1981, the height of the recession when layoffs were at their peak. This apparent pro-cyclicality of inter-firm mobility, suggesting that total quits dominate layoffs, is consistent with similar findings by Burgess and Nickell (1987) for separations in the manufacturing sector. This is indicative of the difficulties in gaining employment once lost or of changing jobs within slack labour markets. Individuals will not quit when the expected returns from doing so are low. High unemployment increases the value of a job match to the worker. In the relatively tight labour market of 1976-79, the opportunities for re-employment were correspondingly greater. Hence those who quit into search unemployment or were laid off could more readily find work within a year. Similarly the likelihood of observing a job-to-job transition with no intervening unemployment is correspondingly greater. Jobs are valued less in tight markets. From the firm's side, Pissarides (1986) notes that layoffs are a response intended to rid the firm of its least productive job matches. As the number of job quits fall, firms can no longer rely on natural wastage and resort to redundancies. This seems particularly relevant to the period 1980-81.

Given this established pattern of turnover, we now concentrate on inter-firm mobility over the period. Tables 6.2 and 6.3 outline the incidence of job-to-job moves by origin industry and occupation respectively. We do not distinguish between separations within and across occupational and industrial classifications. The 1984 LFS suggests that 68 per cent of those who moved firms also undertook a change of occupation. Inter-firm turnover fell by around fifteen per cent between 1977 and 1981, rising by a similar amount thereafter, until by 1984 the separation rate had almost reached the same level as in

1977. Turnover is consistently higher amongst women. These patterns are reflected across all industries. Those industries with high turnover rates, notably Construction and the Retail and Distributive services, maintain these rates throughout the fluctuations in aggregate turnover. The cyclical sensitivity of the Construction industry is most apparent. Turnover is most volatile in this sector. Separation rates in male Manufacturing have remained broadly constant despite large employment falls in this sector. Mobility may also be lower where the value of the job match is higher. There is some evidence of an inverse relation between the industry wage rate and its turnover. The Energy and Communications industries demonstrate consistently low turnover rates and high wage rates. (The 1984 industry wage-turnover correlation coefficients are -0.38 for men and -0.49 for women.)

Turnover rates within occupations follow a similar if less pronounced pattern. Turnover is again higher for women. Separation rates are high throughout the period in the traditionally low paid Personal Service and Selling occupational groups, and generally lower in the more highly paid occupations. Turnover in the Professional and Managerial group remains the exception, being above average over the period. This may reflect the relatively tight labour market in this sector. A continued large number of opportunities would enable such workers to move more freely between firms. (The 1984 correlation coefficients between occupational wage and turnover were -0.23 for men and -0.35 for women).

Table 6.4 combines industrial and occupational separation rates. High (low) turnover industries display high (low) separation rates across all occupations, and vice versa. The standard deviation of occupational quit rates is generally higher across industries than is

the equivalent industrial turnover dispersion across occupations. This is particularly apparent for manual workers. This suggests inter-firm mobility is a response to firm, rather than occupational, specific differentials. High turnover industries exhibit high rates of mobility amongst all workers. The reduction in turnover between 1977 and 1981 holds for all occupations, with the exception of the managerial and professional group, across all industries. Consequently those industries with more professional staff experienced smaller reductions in turnover during the period.

6.4.2 Job Tenure and Turnover

We now examine the relationship between inter-firm mobility and time spent in a job in an attempt to assess the importance of job matching theories. Using our longitudinal dataset, Table 6.5 replicates the "tenure-turnover profile" which appears in Mincer and Jovanovic (1981). We report the proportion of each job tenure category who changed jobs between survey dates. Separation rates decline markedly with tenure, male rates more sharply than female. Indeed, the female profile is less concave over the entire tenure range. Twenty-five per cent of all males with completed tenure of under six months can be expected to change jobs, compared with less than three per cent of those with tenure in excess of twenty years. These observations are consistent with job matching theories. The flatter female tenure profile is indicative of lower specific capital investment and job worth. Since investments generate returns, the concave tenure profile may reflect the growth of these returns and eventual exhaustion. Males with longer expected working horizons may invest more and consequently face steeper profiles. High turnover rates in low tenure groups indicates job shopping.

Turnover also declines with age. The age (or work experience) profile given in Table 6.6 is however less pronounced and distinct compared with the tenure relationship. It nevertheless suggests that the opportunities for, and returns to, inter-firm mobility decline over the life cycle. Heterogeneity amongst workers could also account for these observations. If workers simply differed in the amount of innate human capital, this would be sufficient to generate such profiles and not the idea that workers acquire firm-specific capital which imposes an eventual constraint on mobility. Heterogeneity implies the existence of movers and stayers. Movers will face high flat turnover profiles at all tenure (age) levels. Stayers face downward sloping profiles. Aggregation produces the observed concave relation. In practice the heterogeneity and job shopping effects are complementary. In subsequent turnover regressions we attempt to distinguish between these effects.

We argued earlier that the extent to which the population is successfully matched will be reflected in the completed tenure distribution of the working population. Productive jobs will be characterised by long tenure. Hall (1982) confirmed the existence of a majority of long-term employment relationships in the United States by extrapolating information on a worker's current (incomplete) spell of employment. Current tenure data fails to measure those workers now in jobs that will ultimately last the majority of their working life. It is possible however to estimate the probable additional tenure spell. Table 6.7 summarises our estimates of these 'eventual tenure' figures using similar data from the 1983 LFS, (of which our longitudinal dataset forms a subset). This is achieved by calculating a series of retention rates i.e. the probability that a worker of given age and tenure will remain in the current job for a further specified number of years.

Specifically we compute the n year retention rate for age group w with

current tenure x years as :

$$\frac{\text{\% in age group w+n with tenure x+n}}{\text{\% in age group w with tenure x}} \quad \frac{\text{Employment Rate w+n}}{\text{Employment Rate w}}$$

The employment weights control for differential labour force

attachment over the age cycle. The eventual tenure distribution is

calculated by multiplying these retention rates by the initial tenure

stock.

The eventual tenure of the average worker in the United Kingdom in

1983 is around twice the length implied by the distribution of current

tenure. Men can expect to remain continuously employed twice as long as

women.[9] Median tenure is around 10.5 years (14.7 years for men and 7.8

years for women). Hall's equivalent U.S. estimate was 7.7 years.

Although taken at different years and stages of the business cycle (1978

in the U.S.), our results imply that turnover in Britain is

correspondingly lower. Our results complement that of Main (1982) who

using only a 10 year retention rate calculated from longitudinal data,

estimates eventual U.K. tenure of 20 years for full time men aged 21 and

above. Bellman and Schasse (1988) present similar estimates which

suggest that employment tenure in West Germany is somewhat longer than

in the U.S.

A similar result can be derived from the current tenure distribution

if we were to adopt the approach of Akerlof and Main (1981). Since on

average an individual will be interviewed halfway through any

incompleted spell of employment, we can double the length of current

tenure to arrive at the eventual tenure distribution. Hashimoto and

Raisian (1985) adopt a similar technique when asserting that long-term employment relationships are more prevalent in Japan than in the U.S. This method is not nearly as flexible as the Hall approach, since it allows no scope to estimate interim tenure probabilities. Institutional factors across countries undoubtedly help explain these differences. The relative absence of employment hiring and firing legislation in the U.S. is often cited as evidence of labour market flexibility, yet it does not help foster continuous employment. Firm-specific apprenticeships of the kind practised in Japan and in many skilled manual jobs in Britain, are more likely to engender long-tem job matches. Britain would appear to lie somewhere between the U.S. and Japan with respect to long-term employment relationships.

Our results imply that most men, and to a lesser extent women, eventually acquire a good job match as measured by lengthy tenure. Over one third of men are currently engaged in an attachment to a firm that will last over twenty years. In contrast, only eight per cent of women will remain in the same job match for an equal period, though a notable 37 per cent can be expected to hold a job for more than 10 years. At the other end of the tenure distribution, ten per cent of the working population are in jobs that will last less than two years. If Jovanovic's hypothesis is correct, then these workers are engaging in job shopping. Table 6.8 shows the probability that a new job, one begun within 6 months of the survey interview, will become a long-term match. The likelihood is not large and varies across the age spectrum. Less than a quarter of all teenagers starting a new job will remain with the firm for two years, compared with around sixty per cent of prime age males. Even so, under one half of new jobs will not last five years. This would appear to support the claim that jobs are experience goods

and that certain information is only acquired during the course of the match.

The likely process of job shopping is shown by Table 6.9. The number of new jobs held each year is estimated at double the fraction of workers in jobs with tenure less than six months.[10] We therefore predict that the average man and woman can expect to hold approximately 6 and 8 jobs respectively, over the entire working horizon. The majority of job shopping occurs in the teenage years and early twenties, when the opportunities and returns from doing so are greater. Over the life cycle, women can be expected to hold at least two more jobs than men. Indeed women continue to change jobs regularly until their forties. This may reflect the re-entry of women into the labour market in their late thirties. The higher rate of female turnover seen in Table 6.7 results in them holding more jobs with shorter average durations over the life cycle. Time spent outside the labour force does not appear to offset these observed shorter durations. Women are not therefore found in as productive job matches as men. Levels of worth in work, or firm-financed specific human capital investment, are sufficiently low to create the flatter tenure turnover profiles of Table 6.5. Workers with low match values are more likely to accept alternative job offers as and when they arrive.

6.4.3 Econometric Results

We have stressed the importance of tenure as a significant determinant of the likelihood of inter-firm mobility. We now test this hypothesis more formally utilising the turnover information contained in our longitudinal dataset. The principal equation takes the form:

$$Pr[Mi] = f[Tenure_i, NPCi, Xi, Zi] + e_i$$

where $Pr[Mi]$ is the probability that a worker will change firms over the course of a year, $NPCi$ represents proxies for the non-pecuniary characteristics of the job, Xi is a vector of personal and firm specific characteristics, Zi is a set of variables measuring local labour market activity (including wage proxies) and e_i is a logistically distributed error term. The maximum likelihood estimates are given in Table 6.10. We exclude the self-employed from our analysis.

The most striking feature of our results is the strength and significance of job tenure in explaining inter-firm mobility.

The relationships implied by our results on eventual tenure are confirmed. Workers are more likely to separate from jobs during the initial stages of a match. The tenure turnover relationship is monotonic and declines non-linearly. Workers are particularly likely to change jobs within the first two years of any engagement. This then is consistent with both experience and inspection good theories of turnover. Either workers acquire information regarding aspects of the job hitherto unobservable or an alternative job offer is deemed to be acceptable and a separation ensues. Workers are more likely to observe job characteristics or receive preferential job offers when their stock of firm-specific capital is low, at the beginning of a job match.

We were unable to find a significant difference between the tenure-turnover profiles of men and women suggested by Table 6.5. Whilst being generally negatively signed and therefore suggestive of lower human capital investment by females, the introduction of female-tenure interaction variables into our equation produced a likelihood ratio (L.R.) statistic of just 3.74 ~ $X^2(5)$ which is rejected at the 99 per

cent level. The only behavioural differences of note are a) that single women are significantly more likely to change jobs than men, emphasising the role of such women in the primary workforce and b) women in temporary jobs will not move between firms as frequently as men. Chapter 3 has shown that female temporary workers are less likely to search on the job than their male counterparts. This smaller propensity to search on the job directly translates into reduced inter-firm mobility.

Table 6.10 shows that the age (i.e. experience) dummies are rendered insignificant by the inclusion of tenure variables. Hence the observed tenure-experience profile of Table 6.6 is mostly accounted for by time spent in a job. Older workers are more likely to have longer tenure and so carry the characteristics of a successful job match.

The existence of heterogeneous turnover behaviour other than that implied by job matching behaviour is acknowledged by the inclusion of a dummy variable indicating whether the individual left a further job in the year prior to initial sampling. We therefore attempt to control for an individual's propensity to move at any given level of tenure. The results suggest that were we to exclude this variable we would attribute to the tenure variables factors that were in effect due to heterogeneity. Workers, who left jobs in the recent past are more likely to change jobs again. This may reflect job shopping behaviour, but it also suggests that certain individuals are more prone to movement irrespective of tenure.

Aspects describing the worker's job will also measure the potential for job shopping and mobility. We have already remarked on the significantly higher turnover of men in temporary jobs. This may be indicative of the fact that neither firms nor workers have much

incentive to invest in such a match. A similar argument could apply to the significant positive coefficient on part-time working, the composition of which is almost entirely female, secondary workers. Small establishments will not generally have the resources to provide extensive training programmes nor an internal labour market structure in which productive workers can be rewarded. The likelihood of some form of "voice" (see Freeman (1976)) is higher in larger plants. Turnover is correspondingly lower in these firms.[11] Individuals currently receiving or having received some form of training with a company are less likely to move. Although not strong it does give tentative support to the idea that training, particularly if firm-specific, increases the value of any job match and reduces the probability of a separation.[12] A successful training programme will also be reflected in the observed negative tenure-turnover relationship.

Of the other variables reflecting heterogeneity or human capital differentials, only the education dummies proved to be significant. Workers with qualifications, either academic or vocational, were more likely to change jobs. Highly qualified workers can invest in human capital by moving between firms in the initial stages of their careers. If the labour market for skilled workers is tight, the opportunity to change jobs is that much greater than for poorly qualified, unskilled workers.[13]

Pecuniary rewards from a job match are captured by two variables, the industrial and occupational wage specific to each worker. The coefficients are significant and are signed consistently with the results of Tables 6.2 and 6.3. Turnover is higher in low wage industries and high wage occupations. Workers with higher pecuniary rewarding jobs have a lower propensity to move. The negative industry

wage may reflect a turnover response to inter-industry wage differentials. Table 6.2 shows greater mobility in the low paid areas of retailing and non-metal or electrical manufacturing. Low wage industries could also generate higher turnover if the workers concerned changed firms within the same sector. However, according to our dataset some 68.9 per cent of workers who changed jobs were classified under a different two-digit SIC from the origin industry.[14] Even allowing for reporting error, this would tend to support the idea of a relative earnings response in turnover behaviour. The positive occupational wage probably reflects a relatively tighter labour market for skilled workers and a consequently greater number of job openings. High initial turnover among human capital investors will be more likely to feature in high wage occupations, though over time we would expect high wages to reflect successful job matches.

Our attempts to capture the effect of non-pecuniary rewards on turnover were mixed. We experimented with occupational morbidity statistics, industrial strike and redundancy incidences, each with little success. Our final equation therefore closely resembles that of Viscusi (1979), in that our only significant non-pecuniary determinant is the industrial accident rate (see data appendix). Unlike Viscusi's study, our measure is positive and significant. Workers in high accident rate industries are more likely to separate from jobs. Presumably adverse non-wage working conditions, eventually outweigh any pecuniary consideration. This result supports the findings of Chapter 3 which suggest that a significant negative effect of the industrial accident rate on on-the-job search is evidence that the workers concerned quit into search unemployment rather than remain in an unsatisfactory job. The results in Table 6.10 confirm the tendancy to

separate more readily from dangerous industries. In a world of perfect information there would exist compensating wage differentials and such behaviour would not be observed. This result therefore lends support to experience good theories of turnover.

Our theoretical framework indicated that mobility is greater in low unemployment, high vacancy regions because of the increased opportunities for trade that such conditions engender. Table 6.1 and our results here confirm this general hypothesis. Unemployment has a significant and negative effect on turnover. Workers in high unemployment regions move between jobs less frequently. This finding complements both that of Burgess and Nickell (1987), who present a strong positive effect of the vacancy/unemployment ratio on manufacturing turnover[15], and Akerlof, Rose and Yellen (1988) who find a negative but insignificant unemployment coefficient in a similar regression to ours. Higher unemployment reduces the opportunity for change and increases the competition for available jobs. Similarly a greater supply of vacancies appears to facilitate greater incidence of job shopping, though this effect is not as significant as our unemployment variable. Nevertheless it does indicate that workers are more able to leave jobs when the supply of alternative work is high. Firms may also benefit if the quality of available workers increases as a result. The sign of our final measure of local labour market activity, regional redundancy rates is somewhat puzzling. One might expect that workers would react to such a downturn in labour demand by remaining in the current job. It may be that since our data incorporates both quit and layoff behaviour then a region with high redundancy rates will record a higher number of job separations. Given sufficient advance notification of an impending layoff workers will also

increase job search (as confirmed in Chapter 3), which increases the likelihood of inter-firm mobility.

Table 6.11 presents some alternative specifications of the mobility equation. In column 1, we replace the 6 economic variables with a full set of 38 regional, industrial and occupational dummy variables. Comparison of the log likelihood with that of Table 6.10 shows that the economic variables capture the majority of the unexpained variation. The LR statistic for the joint significance of the dummy variables is 30.6 $\sim X^2(38)$. This is rejected at the 95 per cent level. We also removed the six variables representing local economic conditions as a means of testing their explanatory power. On the basis of the LR statistic (LR = 25.10 $\sim X^2(6)$), we cannot reject the hypothesis that they are jointly significant.

Table 6.11 also provides additional confirmation of the debilitating effect of high unemployment on mobility. In column 2 we interact the tenure variables with a dummy indicating whether the individual was resident in a locality with above average unemployment (13 per cent in Spring 1983). Whilst the standard errors on the interaction parametres are large, the coefficients are negative throughout. High levels of unemployment reduce the ability of workers to change jobs at all tenure levels. This is particularly acute at tenure between 5 and 10 years. We might expect the supply of new jobs to fall in high unemployment regions. The results here indicate that it is those workers with considerable amounts of experience who find the most difficulty changing jobs. Seniority may cushion these workers from layoff unemployment, but the market for their skills outside the workplace becomes restricted. Firm-specific capital may increase a worker's worth within a firm, but is a more of a deterent to mobility under adverse economic conditions.

Table 6.12 illustrates the implications for turnover of our regression results with some calculations of predicted probabilites for given sets of characteristics. Row 1 gives the likelihood of inter-firm mobility for a worker who most closely resembles the average characteristics of our sample. The base characteristics are given at the foot of the Table. The predicted probability of transition is 0.067, near to the sample mean of our dependent variable. Row 2 shows that the same person in a new job match (ie under 6 months duration) is twice as likely to terminate the match within the next year. Increasing job tenure to over ten years reduces the chance of a separation by 300 per cent (row 3). Men engaged in temporary work are three times as likely to change jobs, (row 4), but for female temporary workers the probability of transition falls to 0.036, (row 5). Part-time working almost doubles the likelihood of a move (row 6).

Rows 7 to 10 show the effect of varying aggregate economic conditions. A ten per cent rise in the industry wage differential reduces mobility by the same magnitude that a ten per cent increase in occupational wages will increase it (rows 7 and 8). Turnover also increases by a similar amount if the worker is employed in an industry with an accident incidence rate of 1.5 per 1000 employees (as opposed to the sample mean of 0.67). Row 9 provides some empirical clarification of our findings of the consequences of high unemployment on turnover. Should the worker live in a region with an aggregate unemployment rate of 0.18, not unprecedented in 1983, then the average probability of inter-firm mobility falls by one third. Finally rows 11 and 12 give predicted transition probabilities for differing mixes of characteristics. Young, single workers with short tenure and a history of prior mobility are around four times more likely to change firms within the year than the

average worker. Conversely, the probability that an older worker with tenure in excess of ten years working in a less hazardous industry will undergo a transition is less than one per cent.

In summary, information regarding local economic conditions, potential working hazards and particularly job tenure says much about the likelihood of individual inter-firm mobility.

6.5. Conclusion

Inter-firm mobility by workers is an important subject for analysis since it constitutes the largest single movement within the labour market in any year. The movement of workers across firms facilitates the efficient allocation of human resources. This chapter has analysed these movements in the context of a theoretical framework which views labour turnover as an optimising decision made by individual firms or workers. Labour moves between jobs with the ultimate aim of securing a satisfactory long-term relationship. Only by sampling a succession of jobs/employees can a good match be located. Once secured both worker and firm profit from the resulting rise in marginal productivity.

The main conclusions of this chapter are that:

1) A negative relationship between job tenure and inter-firm mobility is shown to exist in Britain. The longer the employment duration, the more firm-specific capital acquired and the more valuable the match.

2) Turnover is highest in low wage industries and where there are likely to be adverse working conditions. This is supportive of "experience-good", imperfect information theories of turnover. Workers can only discover certain aspects of a job by first-hand working knowledge. This may influence their decision to invest in firm-specific

human capital.

3) Long-term employment relationships are a common feature of the British labour market. The average male is currently engaged in a job that will ultimately last around 15 years. Women, because of their segmented labour market experiences, hold jobs for 7 years on average.

4) Workers only attain such relative stability by extensive job shopping early in their careers. Men can expect to hold 6 jobs and women 8 over their working lifetime.

5) The allocation process is adversely affected by high levels of unemployment. Annual job-to-job movements appear to vary pro-cyclically and as such are highly correlated with the behaviour of job quits into unemployment. Inter-firm mobility of workers living in above average unemployment areas is reduced at all tenure levels. A five percentage point rise in the unemployment rate reduces the average probability of movement by one third.

If unemployment does impair mobility as we have shown, then job shopping is reduced and the opportunity to flow into long-term productive jobs is denied.

Footnotes

1. This result also assumes homogeneity of employed and unemployed job seekers which may be unlikely given the better access to labour market information that the employed should possess.

2. This is because search externalities allow the possibility of a multiplicity of equilibria and hence differential job-matching environments.

3. The LFS asks only those currently engaged in on-the-job search whether they are satisfied with aspects of the current job other than wages. We experimented with instrumenting job satisfaction in our turnover equation based on a prediction equation using the sub-sample of on-the-job seekers, suitably corrected for selectivity bias. However neither the prediction equation nor the instrumented variable proved significant.

4. The LFS includes a question as to whether the individual moved house within the last year, in addition to whether a change of job occurred. By definition our sample is restricted to those who replied negatively to the first question.

5. The sample selection problem can be demonstrated more formally as follows:

   We wish to estimate the unconditional probability that an individual will change jobs during the year. Our dataset only allows us to estimate the likelihood of inter-firm mobility conditional on there being no accompanying residential movement. Using Bayes law

$$Pr(\text{Job Change}) = \frac{Pr(\text{Change Jobs and No Move})}{Pr(\text{No Move/Change Jobs})}$$

$$= \frac{\int_{0}^{\infty} \int_{-\infty}^{0} f(j,m) \, d_j \, d_m}{G(j)}$$

where f(j,m) is a bivariate distribution of the decision to change jobs and/or move, and G(j), is the univariate (conditional) distribution of job change. Our dataset does not contain sufficient information to estimate either the denominator or the numerator. It has proved difficult to devise a technique to circumvent this problem.

6. It is of course possible, given sufficient advance redundancy notification, that a pure job-to-job change measure would incorporate firm initiated behaviour. Conventional wisdom however views job-to-job moves as worker quit decisions. See Gottshalk and Maloney (1985) for an interesting approach to this subject.

7. The industrial wage is also affected by the occupational distribution within industries. Several U.S. authors have established the validity of industry wage differentials however. See Dickens and Katz (1987) for example.

8. From 1983 onward we can also determine the cause of job separation of those subsequently outside the labour force.

9. Hall finds that U.S. women hold a similar number of jobs to men (around ten). We find little evidence that shorter duration is due to the concentration of women in specific occupations. Differences in eventual tenure distributions of men and women in clerical occupations resemble those of the aggregate distribution.

10. Workers may of course begin more than one job within six months. This assumption is made neccessary by an inability to disaggregate tenure below six months when using the 1983 LFS.

11. The LFS does not contain any information regarding union status. The inclusion of plant size will partially control for this effect.

12. General training will of course increase a worker's productivity in all firms and could encourage turnover if the provision of training simultaneously increased the arrival of job offers. The LFS question relating to training is rather vague, referring only to the receipt of "training connected with your job".

13. The inclusion of occupational dummies whilst insignificant, (Likelihood Ratio statistic = 9.6 ~ $X^2(5)$) intimates at a higher likelihood of separation for professional and skilled groups.

14. The inclusion of industrial dummy variables renders both the industrial wage and accident rate terms insignificant (Likelihood Ratio statistic =18.6 ~$X^2(9)$). The only significant industry terms were Construction, Distributive Services and Other Manufacturing, all of which were positively signed and all of which are relatively low paid industries. See Table 6.2. Since the dummy variables obscure the effects we wish to highlight, they are omitted from our final specification.

15. The use of the VU ratio, as in Burgess and Nickell (1987), reduces our model's performance (Log L = -853.0).

Appendix A6

The primary data source for this study is the matched sample of participants taken from the 1983 and 1984 Labour Force Surveys. The raw unmatched data for 1977, 1979, 1981, 1983 and 1984 was supplied to us by the UK Office of Populations Census and Survey and the ESRC Data Archive. The sample is restricted to the population of working age resident in England and Wales. The LFS derived variables, which refer to the respondents' situation in 1983 unless specified, are as follows:

FEMALE = Female dummy variable: 1 if female; 0 otherwise.

AGE1619 = 1 if aged 16-19; 0 otherwise.

AGE2024 = 1 if aged 20-24; 0 otherwise.

AGE5064 = 1 if aged 50-64; 0 otherwise.

DEGREE = 1 if highest qualification is degree or recognised professional qualification; 0 otherwise.

GCE = 1 if obtained 'A' or 'O' level passes or equivalents; 0 otherwise

OTHER = 1 if obtained vocational, technical or any other recognised qualification; 0 otherwise.

SINGLE = 1 if single; 0 otherwise.

DCHILD = 1 if household contains dependent children under 18 years of age; 0 otherwise.

SMALL = 1 if number of people employed at the location where the respondent works is under 25; 0 otherwise.

TEMPORARY = 1 if current job seasonal, temporary, casual or of fixed contract length; 0 otherwise.

PTIME = 1 if respondent reports current job is part-time; 0 otherwise.

TRAIN = 1 if worker has received or is currently receiving training in connection with job; 0 otherwise.

TENLT6M to

    TEN5-10Y = 1 if current tenure is less than 6 months, 6-12 months, 1-2

        years, 2-5 years or 5-10 years respectively; 0 otherwise.

BEFORE = 1 if respondent changed jobs in the year prior to sampling; 0

        otherwise.

UHIGH = 1 if resident in area with above average unemployment; 0

        otherwise.

In addition we have supplemented the LFS dataset with the following:

OCCWAGE = Log of average weekly earnings of men and women disaggregated

        by 11 standard regions and 16 broad occupational categories.

        Source: Department of Employment *New Earnings Survey* (1983),

        Part E, Tables 122-23.

INDWAGE = Log of average weekly earnings of men and women disaggregated

        by 11 standard region and 2 digit SIC. Source: Department of

        Employment *New Earnings Survey* (1983), Part E, Tables 118-21.

VRATE = Regional vacancies (expressed as a percentage of employees in

        employment). Source: Department of Employment *Gazette*, Table

        3.6.

URATE = Log of aggregate area unemployment rate, disaggregated to

        metropolitan county level. Source: Department of Employment

        Gazette, Table 2.9.

REDRATE = Confirmed number of redundancies, disaggregated by 11 standard

        regions (expressed as a percentage of employees in employment).

        Source: Department of Employment, *Gazette*, Table 2.30.

ACCRATE = Number of fatal and major injuries reported to enforcement
authorities per 1,000 employees, disaggregated by 2 digit SIC.
Source: Health and Safety Executive, *Health and Safety
Statistics*, (1984-85), HMSO.

Employment = Employees in Employment disaggregated by 11 standard
regions. Source: Department of Employment, *Gazette*, Historical
Supplement, No.1, (August 1984).

Table 6.1

Job Separation and Outcome, Labour Force Survey 1975-84

	Annual Percentage of Employee Separations	Proportion of moves that are			Unemployment Rate
		E-E	E-U	E-N	
1976-77					
Total Separations	14.8	59.2	20.0	21.1	6.0
: Quits			42.5		
: Job Losses			57.5		
1978-79					
Total Separations	15.9	62.8	15.1	22.1	5.0
: Quits			46.8		
: Job Losses			53.2		
1980-81					
Total Separations	14.7	42.8	34.2	23.0	9.7
: Quits			28.3		
: Job Losses			71.7		
1982-83					
Total Separations	13.7	46.8	29.3	23.9	11.3
: Quits			38.8	75.9	
: Job Losses			61.2	24.1	
1983-84					
Total Separations	14.7	52.2	25.2	22.6	11.6
: Quits			43.4	79.4	
: Job Losses			56.6	20.6	

Note: E-E denotes individual employed by different firm one year after sampling as employed.   E-U denotes movement from employment to unemployment in the course of a year.   E-N denotes a movement from employment to outside the labour force during the year.

Source: Labour Force Surveys (1977, 1979, 1981, 1983, 1984).

Table 6.2

Inter-Firm Mobility by Industry

Industry	Percentage of Employees moving firms during the year											
(1 digit SIC)	All				Male				Female			
	1977	1981	1984	Wage Rank	1977	1981	1984	Wage Rank	1977	1981	1984	Wage Rank
0. Agriculture	4.9	5.0	6.0	8	5.0	5.2	6.0	8	4.2	5.0	5.6	*
1. Energy	4.8	2.8	2.7	1	4.5	2.7	2.6	2	7.4	3.6	4.0	2
2. Metal, Mineral Manufacture	7.1	6.3	6.5	3	5.6	5.7	5.1	4	10.4	7.0	9.9	5
3. Manufacturing	7.4	7.4	7.4	4	7.5	6.8	7.5	7	8.5	9.9	6.9	6
4. Other Manufacturers	9.0	7.6	9.7	9	8.8	7.5	9.4	6	9.3	8.3	10.4	7
5. Construction	13.4	9.0	12.0	6	13.5	8.5	11.8	9	11.8	14.7	13.9	*
6. Distributive Services	10.8	9.0	11.4	10	10.4	8.7	12.1	10	11.3	9.6	10.8	8
7. Transport and Communications	6.8	5.0	5.8	2	6.2	4.5	5.1	5	10.0	7.4	8.8	1
8. Financial Services	9.4	7.8	8.6	5	6.7	5.6	5.4	1	12.1	10.2	9.0	4
9. Public Administration	8.3	7.8	6.1	7	8.1	6.5	8.2	3	8.4	6.0	6.6	3
Mean Quit Rate	*8.6*	*7.1*	*8.4*		*8.3*	*6.5*	*8.2*		*9.3*	*7.9*	*8.8*	

Data Sources: Mobility rates are contained in the 1977, 1981 and 1984 LFS. Wage rankings are obtained from the 1984 New Earnings Survey. The small number of women employed in the Agriculture and Construction industries prevents an accurate estimate of the wage rate from being reported.

Table 6.3

Inter-Firm Mobility by Occupation

Occupation	All				Male				Female			
	1977	1981	1984	Wage Rank	1977	1981	1984	Wage Rank	1977	1981	1984	Wage Rank
1. Professional & Managerial	6.0	8.0	9.6	1	4.0	8.2	9.5	1	7.7	7.2	9.7	1
2. Professional – Health Education	7.3	6.5	6.3	6	5.9	6.1	6.6	5	8.1	6.7	6.1	4
3. Literary, Art, Sport	10.5	4.1	10.7	3	9.3	4.5	10.0	2	13.7	3.4	12.0	3
4. Professional – Scientific	6.7	5.9	6.0	2	6.7	6.0	5.8	3	6.0	4.1	8.1	5
5. General Managerials	5.9	6.5	7.4	5	5.7	6.4	7.1	4	6.8	7.0	6.9	6
6. Clerical	9.3	8.2	8.1	14	6.0	5.2	5.8	12	10.5	9.3	8.8	7
7. Selling	12.9	9.7	13.8	12	13.5	10.4	14.7	8	12.4	9.2	13.2	12
8. Security	8.8	5.3	6.0	4	8.8	5.1	6.3	6	8.5	7.1	2.7	2
9. Personal Services	8.9	7.7	10.4	15	10.7	10.5	11.9	15	8.5	7.0	10.0	13
10. Farming, Fishing	9.0	5.2	7.8	16	8.9	5.3	7.8	16	9.6	4.1	8.3	*
11. Materials Processing (ex. metal & electrical)	9.8	7.9	9.7	11	10.3	7.8	10.1	9	8.5	8.1	8.8	11
12. Materials Processing – metal & electrical	8.1	5.4	7.4	7	8.2	5.5	7.5	7	7.1	4.7	6.7	8
13. Repetitive Assembly	8.1	6.7	8.1	13	8.1	6.0	9.3	12	8.2	7.7	6.5	10
14. Construction, Mining	11.2	5.4	9.2	8	11.2	5.4	9.2	10	*	*	9.1	*
15. Transport	9.4	7.6	7.4	9	9.5	7.5	7.6	11	5.4	10.5	5.3	9
16. Miscellaneous	9.2	4.9	6.0	10	9.1	5.4	6.1	14	10.3	*	1.1	*
Mean Quit Rate	*8.7*	*7.1*	*8.4*		*8.3*	*6.7*	*8.2*		*9.3*	*7.5*	*8.8*	

Data Sources: Mobility rates are taken from the 1977, 1981 and 1984 LFS. Wage rankings are obtained from the 1984 New Earnings Survey. The small number of women employed in occupational categories 10, 14 and 16 prevents an accurate estimate of the wage rate from being reported.

Table 6.4

Turnover Rates by Industry and Occupation

Occupational Grouping		Industry (S.I.C.)										Mean (Std) Dev)
		0	1	2	3	4	5	6	7	8	9	
I:	1977	2.3	3.4	4.4	7.2	6.0	8.0	7.8	5.4	6.8	7.0	6.6 (1.3)
	1981	4.0	3.1	8.5	6.3	7.2	10.9	6.7	3.2	6.8	6.4	6.6 (1.6)
	1984	3.1	2.6	6.1	8.1	10.6	8.9	8.9	6.7	8.2	6.1	7.4 (1.7)
II:	1977	6.1	5.6	12.0	8.6	11.1	9.9	11.4	8.7	10.3	8.9	9.5 (1.3)
	1981	10.5	3.4	3.8	12.4	10.1	15.1	11.0	4.9	9.3	6.0	8.4 (2.9)
	1984	*	3.3	9.1	6.7	11.8	13.2	11.4	7.3	8.0	5.4	8.3 (2.6)
III:	1977	*	*	11.3	15.8	12.4	14.3	12.7	7.7	11.2	10.6	12.1 (1.3)
	1981	*	*	15.5	15.6	14.8	17.6	8.7	4.3	6.9	6.6	9.1 (2.7)
	1984	*	5.0	18.3	18.3	17.7	*	12.9	8.2	10.8	4.4	11.9 (4.5)
IV:	1977	2.9	3.7	5.7	7.1	9.2	14.7	10.4	3.4	6.7	10.8	9.0 (3.4)
	1981	5.9	2.1	4.8	6.2	7.6	7.0	6.8	1.8	5.7	3.5	6.0 (1.8)
	1984	14.3	2.8	6.2	7.5	10.1	12.0	10.8	2.7	8.3	6.0	8.9 (3.0)
V:	1977	8.2	7.2	7.0	6.9	9.1	15.7	11.9	7.4	10.4	8.9	9.0 (2.2)
	1981	5.9	3.4	6.2	7.1	6.4	12.7	11.9	6.6	5.3	5.0	7.1 (2.5)
	1984	8.7	2.2	5.1	5.7	7.6	12.9	12.9	6.0	14.3	6.8	8.4 (3.0)
Mean (Std. Dev)												
1977		*	*	6.9 (2.3)	7.4 (1.3)	9.0 (1.4)	13.4 (2.9)	11.8 (2.7)	6.8 (1.7)	9.5 (1.6)	8.3 (1.2)	
1981		*	*	6.4 (2.3)	7.4 (2.3)	7.6 (1.7)	9.1 (2.9)	9.0 (2.1)	5.0 (1.9)	7.8 (1.4)	5.8 (0.8)	
1984		*	3.1 (2.4)	6.4 (2.2)	7.3 (1.8)	9.7 (2.1)	12.0 (2.6)	11.4 (1.7)	5.9 (1.5)	8.6 (1.6)	5.8 (0.5)	

Sources: 1977, 1981, 1984 LFS. * indicates small cell numbers, estimate not reported. Occupational groupings are; I: Managerial and Professional, II: Clerical and Related, III: Other Non-Manual, IV: Skilled Manual, V: Unskilled Manual. Industrial Classifications are as given in Table 6.2.

Table 6.5

Inter-Firm Mobility by Job Tenure

| Tenure prior to Separation | Proportion of Tenure Category Changing Jobs | | |
	All	Male	Female
0-6 months	.194	.253	.149
6-12 months	.152	.164	.141
1-2 years	.120	.154	.090
2-5 years	.076	.096	.053
5-10 years	.047	.046	.049
10-20 years	.023	.024	.023
20 years+	.022	.025	*

Note: * denotes small sample size, estimate not shown.
Source: LFS longitudinal dataset 1983-84

Table 6.6

Inter-Firm Mobility by Age

| Age | Proportion of Category Changing Job | | |
	All	Male	Female
16-19	11.0	10.7	11.5
20-24	9.4	9.3	9.5
25-29	9.1	10.0	7.4
30-34	7.6	6.0	10.6
35-39	7.3	7.6	6.8
40-45	3.5	2.0	5.5
45-49	4.4	3.8	5.1
50-54	2.5	2.2	2.8
55-59	2.5	2.8	1.8
60-64	–	1.3	–

Source: LFS longitudinal dataset 1983-84.

Table 6.7

The Distribution of Current and Eventual Tenure

| Tenure | Percentage of Workers in each Tenure Category | | | | | |
| | Current | | | Eventual | | |
	All	Male	Female	All	Male	Female
0-6 months	7.6	6.3	9.4	0.6	0.4	0.9
6 months-1 year	7.3	6.1	8.9	5.1	4.5	5.9
1-2 years	9.0	7.2	11.5	3.5	2.0	5.5
2-5 years	23.5	20.7	27.2	16.0	12.4	21.0
5-10 years	22.5	21.8	23.5	23.6	19.1	29.7
10-20 years	19.7	22.5	15.9	26.4	24.7	28.6
20 years+	10.4	15.5	3.5	24.8	36.8	8.3
Median Tenure (Years)	5.6	7.2	4.3	10.5	14.7	7.8

Source: 1983 LFS

Table 6.8

The Expected Tenure of New Jobs

Age and Sex	Probability of reaching given Tenure					
	6-12 months	1-2 years	2-5 years	5-10 years	10-20 years	20+ years
Males						
16-19	.998	.568	.236	.197	.107	.063
20-24	.953	.532	.532	.337	.151	.092
25-29	.838	.483	.483	.353	.209	.117
30-34	.889	.567	.567	.409	.274	.144
35-39	.794	.629	.629	.435	.304	.189
40-44	.962	.627	.612	.438	.305	.103
45-49	.834	.613	.590	.461	.317	-
50-54	.999	.633	.633	.478	.311	-
55-59	.999	.778	.655	.485	-	-
60-64	.721	.524	.524	-	-	-
Females						
16-19	.999	.600	.172	.112	.037	.007
20-24	.891	.589	.589	.190	.044	.014
25-29	.875	.619	.453	.196	.069	.022
30-34	.891	.525	.390	.236	.096	.023
35-39	.881	.649	.485	.319	.153	.024
40-44	.978	.730	.680	.475	.225	-
45-49	.715	.693	.693	.486	.257	-
50-54	.999	.652	.652	.504	-	-
55-59	.775	.570	.570	-	-	-

Source: LFS 1983.

Note: Probability of reaching given tenure is the n year retention rate calculated for all new jobs i.e. jobs with a current duration of less than 6 months.

Table 6.9

The Incidence of Job Shopping Over the Life Cycle

Age	New Jobs Per Year		New Jobs over the Age Interval		Cumulative Number of Jobs Held	
	Male	Female	Male	Female	Male	Female
16-19	0.415	0.446	1.7	1.8	1.7	1.8
20-24	0.212	0.243	1.1	1.2	2.8	3.0
25-29	0.168	0.221	0.8	1.1	3.6	4.1
30-34	0.122	0.247	0.6	1.2	4.2	5.3
35-39	0.092	0.195	0.5	1.0	4.7	6.3
40-44	0.079	0.129	0.4	0.6	5.1	6.9
45-49	0.070	0.099	0.4	0.5	5.5	7.4
50-54	0.054	0.079	0.3	0.4	5.8	7.8
55-59	0.044	0.062	0.2	0.3	6.0	8.1
60-64	0.056	-	0.3	-	6.3	-

Source: 1983 LFS. The number of new jobs per year is the fraction of each age category with current tenure under 6 months.

Table 6.10
Logistic Estimation of the Likelihood of Inter-Firm Mobility, 1983-4

Independent Variable	Sample Mean	Estimate	Standard Error
Constant		-9.01	(2.96)**
FEMALE	0.41	-0.50	(0.31)*
AGE1624	0.05	-0.29	(0.32)
AGE2024	0.11	0.07	(0.21)
AGE5064	0.22	-0.22	(0.23)
DEGREE	0.14	0.63	(0.25)**
GCE	0.32	0.65	(0.18)**
OTHER	0.11	0.68	(0.22)**
SINGLE	0.24	-0.30	(0.25)
DCHILD	0.51	0.02	(0.15)
Job Characteristics			
: SMALL	0.32	0.26	(0.14)*
: TEMPORARY	0.03	1.07	(0.40)**
: PTIME	0.17	0.46	(0.25)*
: TRAIN	0.07	-0.21	(0.26)
: TENLT6M	0.05	1.98	(0.32)**
: TEN6-12M	0.07	1.59	(0.31)**
: TEN1-2Y	0.08	1.62	(0.27)**
: TEN2-5Y	0.23	1.17	(0.24)**
: TEN5-10Y	0.23	0.68	(0.25)**
BEFORE	0.05	0.60	(0.25)**
FEMALE*SINGLE	0.12	0.67	(0.32)**
FEMALE*TEMPORARY	0.02	-1.22	(0.57)**
Local Economic Conditions			
OCCWAGE	4.87	1.48	(0.59)**
INDWAGE	4.87	-1.16	(0.50)**
VRATE	0.55	0.48	(0.34)
URATE	-2.04	-1.25	(0.62)**
REDRATE	0.17	0.25	(0.17)
ACCRATE	0.67	0.17	(0.10)*

Diagnostics

Log L	-850.91
Model LR Test (d.f.)	119.14 (27)
% Correct Predictions	93.5
Mean of Dependent Variable	0.065
Sample Size	3947

Note: ** denotes significant at 95 per cent level, * denotes significant at 90 per cent level 2-tailed t test.

Table 6.11
Alternative Specification of Inter-Firm Mobility, 1983-4

Independent Variable	Model I		Model II	
TENLT6M	2.01	(0.35)**	1.99	(0.42)**
TEN6-12M	1.59	(0.31)**	1.65	(0.39)**
TEN1-2Y	1.62	(0.28)**	1.64	(0.37)**
TEN2-5Y	1.18	(0.24)**	1.33	(0.31)**
TEN5-10Y	0.69	(0.24)**	1.04	(0.32)**
URATE	—		-1.05	(0.64)*
UHIGH*TENLT6M	—		-0.02	(0.45)
UHIGH*TEN6-12M	—		-0.11	(0.45)
UHIGH*TEN1-2Y	—		-0.01	(0.27)
UHIGH*TEN2-5Y	—		-0.30	(0.37)
UHIGH*TEN5-10Y	—		-0.80	(0.43)*
Regional Dummies	Yes		No	
Industry Dummies	Yes		No	
Occupation Dummies	Yes		No	

Diagnostics

Log L	-835.61		-848.55	
Model LR Test (d.f.)	246.77	(59)	203.85	(32)
% Correct Predictions	93.5		93.5	
Mean of Dependent Variable	0.065		0.065	
Sample Size	3947			

Note: ** denotes significant at 95 per cent level, * denotes significant at 90 per cent level 2-tailed t test. Standard errors in parentheses. Both regressions contain the same variables as given in Table 6.10 in addition to those reported above.

Table 6.12

Predicted Probabilities of Inter-Firm Mobility for Given Characteristics

		Predicted Probability
1)	Base Characteristics*	0.067
2)	As 1) but TEN1619=1	0.137
3)	As 1) but Tenure in excess of 10 years	0.021
4)	As 1) but TEMPORARY=1	0.172
5)	As 4) but FEMALE=1	0.036
6)	As 1) but PTIME=1	0.101
7)	As 1) but 10% rise in INDWAGE	0.059
8)	As 1) but 10% rise in OCCWAGE	0.076
9)	As 1) but URATE= 0.18	0.045
10)	As 1) but INDRATE=1.5	0.076
11)	As 1) but AGE2024=1, DEGREEE=1, SINGLE=1, OCHILD=0, SIZE=1, TEN612M=1, BEFORE=1, living in low unemployment, high vacancy, high wage region	0.320
12)	As 1) but AGE5064=1, no formal qualifications, tenure in excess of 10 years, low industrial accident rate	0.005

*   Base characteristics define male aged 25-49, married with dependent children, working full time in some large plant for between 2 and 5 years.

Chapter 7: Summary and Conclusions

Mobility is essential to the efficient working of an economy because it transports labour from situations where it is no longer needed, or under-utilised, to environments in which it can increase productive worth. We have sought throughout this thesis to establish how unemployment may affect the mobility of labour. In practice, there is no single, readily identifiable relationship because of the breadth of definition that these two concepts encompass. We have therefore chosen to highlight five aspects of labour mobility and examined the potential for unemployment to influence each specific case. We have adopted micro-theoretic considerations to address individual behavioural decisions. The Labour Force Survey has proved a rich source of labour market data with which to analyse these issues. The conclusion that arises from these studies is that high levels of unemployment generally impose constraints upon the mobility of all individuals, not just the unemployed. The capacity for the movement of labour to act as an equilibriating force in the economy therefore functions less effectively when it is most needed, during periods of depressed aggregate demand. In this final chapter we summarise the results that led us toward this conclusion.

We saw in chapter 2 how inter-regional movements of labour could be influenced by unemployment at three levels. There is evidence that experience of the unemployed state provides a strong incentive to migrate. The potential rewards and costs to mobility ensure migration is a more valid option to the unemployed worker. Having controlled for

labour market status, we were unable to identify any additional influence of regional unemployment differentials on gross migratory behaviour. The observed outward movement of labour from high unemployment regions cannot be attributable to regional economic signals, but is instead caused by the greater propensity to migrate of the unemployed members of that region. A higher proportion of unemployed results in larger regional outflows.

Chapter 2 also provided evidence of a dimunition of mobility following the rise in unemployment that occured during the early eighties in Britain. Comparing migration responses across periods of low and high aggregate unemployment, we found evidence of a dramatic decline in the migration propensities of the unemployed. Whilst remaining the group most likely to undertake movement, the probability of migration for a typical unemployed worker halved over the period 1977 to 1984. In contrast, estimated migration probabilities for employed workers were little changed. Hence inter-regional mobility following a rise in unemployment suffers in the area where it would be most beneficial.

Evidence of this debilitating unemployment effect is also uncovered in chapter 3's analysis of on-the-job search. Although the decision to look for alternative employment is dominated by worker satisfaction in the current job, there exists a significant disincentive effect of high unemployment on search. Employed workers with long job tenures are generally in productive job matches. They have acquired a degree of firm-specific capital which renders their outside worth relatively low. Pecuniary disparities, as captured by industry wage differentials and non-pecuniary job characteristics, as measured by industrial accident rates capture aspects of job dissatisfaction that induce on-the-job search.

However workers who happen to live in high unemployment regions are demonstrably less likely to search on-the-job. Since this is the product of the decision to seek alternative work and to search in employment conditional on search, the observed negative coefficient must imply that high unemployment discourages the unconditional probability of job search and hence future mobility.

In addition it seems that the search strategies adopted by employed job seekers are also affected by local economic conditions. Most employed job seekers choose methods of search that are readily integrable into a working environment. High unemployment does however encourage workers to seek the help of intermediaries in their attempts to contact alternative job offers. Use of employment agencies, whether public or private, is concentrated in high unemployment regions. This suggests employed job seekers attempt to maximise the likelihood of making contact with existing vacancies and that this is best secured, in high unemployment areas, through an agency.

Chapter 4 was principally concerned with the role of unemployment benefits in promoting the mobility of unemployed workers. We provided empirical evidence that benefit recipients maintain a stronger labour force attachment. In addition, for the subset of workers who commit themselves to the labour market, benefit claimants search more extensively. The harder an unemployed worker searches, the greater the likelihood of locating a job vacancy and the higher the probability of gaining employment, for a specified level of worker choosiness. It is of course possible that benefits simultaneously affect the reservation wage, an issue addressed by numerous authors in earlier studies. Rather, chapter 4 sought to highlight the ways in which unemployment benefit can encourage, as opposed to discourage, the movement of unemployed workers.

We also uncovered evidence of an additional interaction between mobility and unemployment entering through the depressing effect of adverse economic conditions on search effort. The higher the level of unemployment, the fewer job search methods used by the unemployed. This complements the results of chapter 3. A reduction in job availability leads to an entrenchment of search effort.

The labour market is determined by continuous dynamic movements. The final two chapters were concerned with attempts to identify aspects of labour mobility that would ordinarily be denied in an analysis of conventional LFS data. We therefore constructed a two period longitudinal dataset by matching a sub-set of individuals interviewed in both the 1983 and 1984 surveys. This considerably expands our capability of investigating dynamic labour market issues in Britain. We are now able to determine the effects of previous environment and actions on current status in a more detailed and efficient manner. Despite difficulties with the randomness of the sample (we exclude the more mobile members of the population), the potential benefits for continued use of this dataset, and others similarly constructed over different time periods, are obvious. Future work will follow on from the studies presented here.

Chapter 5 made advantage of the present dataset to study the movement of workers across the states of employment, unemployment and inactivity. Using a broad Markovian framework, it was possible to estimate gross and individual annual probabilities of transition between these states. Whilst we are unable to account for the possibility of multiple transitions over our sample period, our results indicated the degree of mobility in the labour market. Over 4 million individuals can be expected to change status within a year. The probability of

transition was shown to vary substantially across demographic groups. Differential transition probabilities imply differential labour market problems for these groups. Over 80 per cent of prime age male unemployment inflow is caused by employment separation. Conversely, the majority of female and teenage unemployment was shown to be caused by difficulties of certain members of these populations in gaining employment having entered the labour force. Yet most women and teenagers face little difficulty in gaining employment. This suggests the existence of within-group heterogeneity.

Prime age and older men also face the greatest problem escaping unemployment. These conclusions were supported by the individual transition regressions. The results emphasised the dominance of heterogeneity over state duration influences. Since we estimated annual and not instantaneous transitions, we were unable to control for potential offsetting interactions of the explanatory variables on the alternative transition rates. Unemployment and inactivity outflows appear relatively impervious to state duration effects given observed heterogeneity. In contrast, state spell duration is the dominant influence on employment outflows. Human capital acquisition theories, which explain worker attachment to the employed labour force, do not appear to hold in reverse for the unemployed labour force. It should be stressed that these conclusions are very much specific to this dataset. Ideally we would require more precise information on the timing of any transition to deal with this question.

Chapter 5 did however confirm the results of earlier chapters, notably the effect of job search in encouraging mobility. The effect of unemployment benefit is however ambiguous once we control for the level of worker search effort. Though as chapter 4 stressed, the role of

unemployment benefits is to promote search effort.

Chapter 6 also drew upon the longitudinal dataset to analyse annual job to job movements. This is an important area for study since these movements constitute the largest single labour force flow in any year. Only by indulging in job shopping can workers move into long-term productive employment. We demonstrated the high incidence of inter-firm mobility, particularly amongst workers early in their careers. Men can expect to hold 6 jobs and women 8 over their working lifetime. The majority of these jobs are held only briefly as workers (and firms) sample the labour market.

We estimated that long-term employment relationships prevail in the British economy. Workers eventually move into jobs that can be expected to last 15 years on average, if male, and 7 years if female. Using the matched dataset we were able to show the dominance of job tenure over labour market experience, as proxied by age, in determining inter-firm mobility. This is consisitent with job-matching and firm-specific theories of turnover. The more valuable the match the less likely a separation. Job worth evolves over time. The ability to move into long-term employment is denied by high levels of unemployment. Inter-firm mobility varies pro-cyclically and is reduced in high unemployment regions at all tenure levels.

This thesis therefore ends with a similar result to that with which it began. We are led to conclude, from the evidence presented, that whilst the ability of labour mobility to act as an equilibriating mechanism in the allocation of human resources is undisputed, the opportunities for efficency enhancement appear to be diminished by high levels of unemployment.

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Errata

The following references should also appear in the bibliography:

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