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Houston, Donald Sinclair (2001) *Spatial barriers to employment within metropolitan areas: testing the spatial mismatch hypothesis using evidence from firm relocations in the Glasgow conurbation.*

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Spatial barriers to employment within metropolitan areas

**Testing the spatial mismatch hypothesis using evidence
from firm relocations in the Glasgow conurbation**

Thesis submitted for the degree of Doctor of Philosophy by

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December 2001

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ABSTRACT

The causes of high unemployment in the cores of metropolitan areas in Britain and in other countries are the subject of much debate. The skills profile of people who live in urban neighbourhoods has been shown to be strongly associated with neighbourhood unemployment rates; there is said to be a 'skills mismatch' between the unemployed and the job vacancies available. According to this perspective, metropolitan housing markets concentrate people disadvantaged in the labour market together, thus accounting for the spatially uneven pattern of unemployment. However, this perspective does not make reference to the marked deconcentration and restructuring of employment which has been occurring within metropolitan areas since the 1950s. The local availability of suitable jobs has generally not been incorporated into explanations of the spatial distribution of unemployment. However, in the US, the 'spatial mismatch hypothesis' literature has attempted to add this dimension to the debate, although specifically in attempting to explain high unemployment among African Americans and other ethnic minority groups, whose members tend to be concentrated in metropolitan cores. Findings have been mixed, and the spatial mismatch hypothesis remains contested.

This thesis applies the spatial mismatch hypothesis to the Glasgow conurbation in Britain. It also develops an innovative methodology which addresses some of the methodological concerns associated with much previous work and allows three different types of spatial barrier to employment to be examined – commuting, residential mobility and job search/ recruitment. Specifically, this thesis looks at firms which have relocated within the Glasgow conurbation. The number of employees who leave their job or move house because their employer relocates is examined in order to assess to what extent commuting and residential mobility are barriers to employment within metropolitan areas. Recruitment patterns to the firms' new sites are analysed in order to assess the extent of job search and recruitment as spatial barriers to employment.

The results show that those without access to a car and those in lower-paid and lower-skilled jobs are least able to commute to the new sites, and are the least able to move house closer to work, and so consequently are more likely to leave their job. Those in higher paid and more secure jobs are more likely to move house closer to work. People recruited at the new sites tend to live much closer to the firms than the remaining original workforce, which suggests that across space, job search and recruitment processes, as well as social networks and other neighbourhood effects, may be greater barriers to employment than commuting.

The theoretical and policy implications of these findings are discussed. It is argued that skills and spatial mismatches reinforce each other, and that this interaction needs to be incorporated into explanations of the relative importance of each. The proximity of jobs to neighbourhoods within metropolitan areas needs to be considered in understanding the level of unemployment in small areas. Explanations of unemployment more generally need to differentiate more clearly between explanations of the spatial distribution of unemployment, explanations of the probability of different individuals being unemployed, and explanations of the overall level of unemployment.

Policies to deal with unemployment need to be designed at the local level in order to take account of the level and type of demand and supply of labour in each local labour market. Suitable housing and employment opportunities should be promoted in closer proximity to one another, by attempts to reconcentrate employment in metropolitan areas, and in increasing residential mobility in all housing tenures. Policies to improve public transport, increase low income groups' access to private transport, and schemes to aid job search would also be of benefit.

ACKNOWLEDGEMENTS

I would like to thank the Economic and Social Research Council (ESRC) and Glasgow City Council for their financial support via an ESRC CASE Studentship, without which I would have been unable to carry out this research.

I am indebted to Keith Kintrea and Bill Lever for providing advice throughout the course of this work, and for patiently reading and commenting on numerous drafts. Thanks are due to David Webster for encouraging me to be ambitious in this work. I would also like to thank Tony Champion and Anne Green for providing useful comments on an earlier draft of this thesis.

The following people also helped me throughout the course of this research in a variety of ways: Glenn Athey, Nick Bailey, Nicky Burns, Jo Dean, Marjorie Houston, Margaret Keoghan, John Parr, Mark Probyn, Mike Shand and Ivan Turok.

Finally, I would like to express special thanks to Catherine Kennedy for all her encouragement, advice, understanding and support over the last five years.

TABLE OF CONTENTS

Abstract	ii
Acknowledgements	iii
Table of contents	iv
List of figures	xi
List of maps	xii
List of tables	xiii

PART ONE – BACKGROUND

1.	INTRODUCTION	2
1.1	Introduction	2
1.2	The spatial distribution of unemployment within metropolitan areas	3
1.3	Understanding the spatial distribution of unemployment within metropolitan areas	4
1.4	Aim, contribution and approach	8
1.5	Structure of thesis	9
2.	THE SPATIAL DISTRIBUTION OF UNEMPLOYMENT WITHIN METROPOLITAN AREAS	11
2.1	Introduction	11
2.2	The spatial distribution of unemployment within US metropolitan areas	12
2.3	The spatial distribution of unemployment within British metropolitan areas	13
2.4	Employment deconcentration within British metropolitan areas	17
2.5	Policies to deal with urban unemployment in Britain	21
2.5.1	Urban regeneration initiatives	21
2.5.2	Urban policy	22
2.5.3	Policies to deal with unemployment	22
2.5.4	Transport policy	23
2.6	Conclusion	24

3.	UNDERSTANDING THE SPATIAL DISTRIBUTION OF UNEMPLOYMENT WITHIN METROPOLITAN AREAS	26
3.1	Introduction	26
3.2	Skills mismatch in metropolitan areas	27
3.2.1	Outline of the skills mismatch perspective	27
3.2.2	Explaining the spatial distribution of unemployment within metropolitan areas	29
3.2.3	The demand side of the labour market	30
3.2.4	Spatial frictions within metropolitan areas	31
3.2.5	Conclusion	32
3.3	Spatial mismatch in metropolitan areas	33
3.3.1	Outline of the spatial mismatch hypothesis	34
3.3.2	The spatial mismatch hypothesis in British metropolitan areas	37
3.3.2.1	Contrasts between US and British metropolitan areas	39
3.3.3.2	Contrasts in specific spatial barriers	40
3.3.3	Critique of the spatial mismatch hypothesis	43
3.3.3.1	Assumption one – that the deconcentration of employment is greater than the deconcentration of population	45
3.3.3.2	Assumption two – that the unemployment rates found in the cores of metropolitan areas are greater than those in the rings	48
3.3.3.3	Assumption three – that employment deconcentration is not related to the quality of the workforce resident in metropolitan cores	49
3.3.3.4	Assumption four – that residential location influences employment prospects, but not vice-versa	51
3.3.3.5	Assumption five – that the daily transport mobility of core and ring residents is the same	55
3.3.3.6	Assumption six – that unemployment is the main outcome of low accessibility to jobs	57
3.3.3.7	Assumption seven – that commuting and residential mobility are the principal spatial barriers to employment	58
3.3.4	Conclusion	60
3.4	A conceptual framework in which to understand the spatial distribution of unemployment within metropolitan areas	61
3.4.1	Conclusion	67
3.5	Summary and conclusions	68

PART II – METHODOLOGY AND DATA

4.	METHODOLOGY	73
4.1	Introduction	73
4.2	Previous approaches	74
4.2.1	Comparison of commuting times	74
4.2.2	Comparison of earnings	76
4.2.3	Measures of job proximity	78
4.2.4	Conclusions	81
4.3	An alternative approach – ‘natural spatial experiments’	82
4.3.1	Transport improvements	85
4.3.2	Forced housing relocations	86
4.3.3	Firm relocations	86
4.4	Methodological design and hypothesis construction	89
4.4.1	Summary of hypotheses	96
4.5	Critique of the firm relocation approach	96
4.6	Non-spatial influences on propensity to leave employment or move house	102
4.7	The characteristics of ‘leavers’ and ‘movers’	102
4.8	Testing the spatial mismatch hypothesis in the Glasgow conurbation	103
4.8.1	Employment and population deconcentration	105
4.8.2	Spatial distribution of unemployment	108
4.8.3	Segregation of immobile groups	109
4.8.4	Low car ownership in the core of the conurbation	111
4.8.5	Geographical size	118
4.8.6	Slackness of the metropolitan labour market	119
4.8.7	Representativeness of other British metropolitan areas	119
4.8.8	Policy salience	121
4.9	Summary and conclusions	123

5.	DATA REQUIREMENTS AND DATA COLLECTION	128
5.1	Introduction	128
5.2	Data requirements	128
5.2.1	The firms	129
5.2.2	The employees	130
5.2.3	The friction of distance	132
5.3	The firms	134
5.3.1	Identifying firm relocations	135
5.3.2	Contacting firms	138
5.3.3	Representativeness of the firms	138
5.3.4	Reasons for relocation	139
5.3.5	Changes to jobs and incentives offered	141
5.3.6	The nature of the firm relocations	142
5.3.7	The geographical accessibility of the firms' new sites	146
5.4	The employees	148
5.4.1	A survey of employees	149
5.4.2	Hypotheses one to four (commuting constraints)	150
5.4.3	Hypotheses five to nine (residential mobility)	151
5.4.4	Hypothesis ten (job search and recruitment)	152
5.4.5	Qualitative interviews with retained staff and new recruits	152
5.4.6	Leaver surveys and interviews	153
5.4.7	Management interviews	153
5.4.8	Analysing the number and characteristics of leavers	154
5.4.8.1	Estimating the true number of leavers	156
5.4.8.2	Assessing the characteristics of leavers	156
5.5	The friction of distance	158
5.6	Response rate and possible biases	160
5.6.1	Response rate and the characteristics of the sample	160
5.6.2	Possible biases	163
5.7	Summary and conclusions	165

PART III – RESULTS

6.	COMMUTING AS A BARRIER TO EMPLOYMENT WITHIN THE GLASGOW CONURBATION	170
6.1	Introduction	170
6.2	Overall impact of the firm relocations	172
6.2.1	Hypothesis one: some staff leave their jobs because of the firm relocations	173
6.2.2	Hypothesis two: those who leave due to the relocations tend to end up in a weaker economic position	179
6.3	Spatial influences on propensity to leave because of the journey to work	181
6.3.1	Hypothesis three: those who have, or would have had, the longest (shortest) commutes to the firms' new sites are more (less) likely to leave due to the relocations	181
6.3.2	Hypothesis four: those who had, or would have had, their commutes lengthened (shortened) the most by the firm relocations will be more (less) likely to leave due to the relocations	184
6.4	Non-spatial influences on leave propensity	186
6.5	Who is affected the most by commuting as a barrier to employment?	191
6.5.1	Multi-variate analysis of propensity to leave because of the journey to work	199
6.5.2	Leave propensity by firm	207
6.6	Transportation and travel impacts of the firm relocations	209
6.7	Summary and conclusions	211
7.	RESIDENTIAL MOBILITY AS A BARRIER TO EMPLOYMENT WITHIN THE GLASGOW CONURBATION	216
7.1	Introduction	216
7.2	Spatial constraints on residential mobility within the Glasgow conurbation	218
7.2.1	Hypothesis five: residential mobility rates do not rise as a result of the relocations	218
7.2.2	Hypothesis six: there is no relationship between the length of commute and the probability of moving house	220
7.2.3	Hypothesis seven: there is no relationship between the amount that workers' commutes were altered by their employer's relocation and their likelihood of moving house	222
7.2.4	Hypothesis eight: there is no relationship between the length of the initial commute of those who move house (for any reason) and their likelihood of shortening their commute as a result of moving house	223
7.2.5	Hypothesis nine: there is no relationship between the amount that the commutes of those who move house (for any reason) were altered by their employer's relocation and their likelihood of shortening their commute as a result of moving house	225

7.3	The influence of non-spatial factors on residential mobility with the Glasgow conurbation	232
7.4	Who is affected the most by residential mobility as a barrier to employment?	235
7.4.1	Multi-variate analysis of propensity to make commute-shortening residential moves	242
7.5	Summary and conclusions	248
8.	JOB SEARCH AND RECRUITMENT AS SPATIAL BARRIERS TO EMPLOYMENT WITHIN THE GLASGOW CONURBATION	251
8.1	Introduction	251
8.2	Methodology	253
8.2.1	Recap of methodology to test hypothesis ten	253
8.2.2	Critique of hypothesis ten	255
8.3	Hypothesis ten: new recruits tend to live closer to the firms' new sites than retained staff	256
8.4	Job search as a spatial barrier to employment within the Glasgow conurbation	259
8.4.1	The spatial nature of different job search information channels	260
8.4.2	The spatial extent of job search behaviour	261
8.5	Recruitment as a spatial barrier to employment within the Glasgow conurbation	265
8.5.1	The spatial coverage of job vacancy advertising	265
8.5.2	Spatial implications of recruitment criteria	267
8.6	Summary and conclusions	267

PART IV – DISCUSSION AND CONCLUSION

9.	DISCUSSION	271
9.1	Introduction	271
9.2	Assessment of findings	272
9.2.1	The overall impact of the firm relocations	272
9.2.2	Commuting as a barrier to employment	273
9.2.3	Residential mobility as a barrier to employment	276
9.2.4	Job search and recruitment as spatial barriers to employment	277
9.2.5	The relative importance of different spatial barriers to employment	278
9.3	Assessment of the firm relocation methodology	279
9.3.1	Analysis of commuting as a barrier to employment	280
9.3.2	Analysis of residential mobility as a barrier to employment	281
9.3.3	Analysis of job search and recruitment as spatial barriers to employment	282
9.3.4	Overall assessment of the firm relocation methodology	283
9.3.5	Issues for future research into the effects of spatial mismatch in other metropolitan areas	284
9.4	Implications of the results for current understanding of the spatial distribution of unemployment within metropolitan areas	288
9.4.1	Introduction	288
9.4.2	Spatial and skills mismatches within metropolitan areas	289
9.4.3	Understanding neighbourhood disadvantage	292
9.4.4	Understanding unemployment	294
9.5	Implications of the results for policies influencing the spatial distribution of unemployment within metropolitan areas	295
9.5.1	Introduction	295
9.5.2	Urban regeneration initiatives	295
9.5.3	Urban policy	297
9.5.4	Policies to deal with unemployment	299
9.5.5	Transport policy	301
9.5.6	Issues for Glasgow City Council	304
9.6	Summary and conclusions	307
10.	CONCLUSION	312
	Bibliography	318
	Appendix one – firm biographies	338
	Appendix two – questionnaire	346
	Appendix three – interview schedules	367

LIST OF FIGURES

3.1	Conceptual model of labour and housing market interactions with reference to neighbourhood <i>i</i>	64
5.1	Normal distribution of propensities to leave because of the journey to work, with analysis groups marked (illustrative only)	158
6.1	Impact of firm relocations – sampled totals	175
6.2	Impact of firm relocations – actual totals reported by firms	176
6.3	Impact of firm relocations – estimated actual totals	177

LIST OF MAPS

4.1	1981-91 change in the spatial distribution of jobs, Glasgow conurbation	112
4.2	1981-91 change in the spatial distribution of unskilled jobs, Glasgow conurbation	113
4.3	1991 spatial distribution of unemployment rates, Glasgow conurbation	114
4.4	1991 spatial distribution of social renters, Glasgow conurbation	115
4.5	1991 spatial distribution of unskilled headed economically active households, Glasgow conurbation	116
4.6	1991 spatial distribution of households without a car, Glasgow conurbation	117
5.1	The firm relocations	144

LIST OF TABLES

2.1	Unemployment rates in eight US metropolitan central cities and suburbs, 1990	13
2.2	Unemployment rates in British metropolitan cores and rings, 2000	15
2.3	Employment change in British metropolitan areas, 1984-93	19
3.1	Labour market accounts for Britains' metropolitan cores, 1981-91	45
4.1	Distribution of distance to work of retained staff and new recruits, Gore and Herrington (1997)	86
4.2	Zax and Kain's (1996) move and quit rates	87
4.3	Research objectives and research hypotheses	97
4.4	Labour market accounts, Glasgow City, 1981-91	107
4.5	The weakness and strengths of methods to test the spatial mismatch hypothesis	127
5.1	Industrial composition of sampled firms and their employees in comparison to previous surveys	139
5.2	Mean travel times to firms' old and new sites (generalised minutes)	147
5.3	Public transport:car generalised travel time ratios to firms' old and new sites, to George Square and across the Glasgow conurbation as a whole	148
5.4	Summary of surveys and interviews	162
5.5	Estimated response rates by occupational group	163
6.1	Mean commutes to the firms' new sites by workers' propensity to leave because of the journey to work (generalised minutes)	181
6.2	Propensity to leave because of the journey to work, by mode of transport	183
6.3	Changes in workers commutes induced by firm relocations, by propensity to leave because of the journey to work	184
6.4	Summary of outcomes of the testing of hypotheses one to four	185
6.5	Reasons for leaving or considering leaving, for the original workforce and new recruits	187
6.6	Reason for leaving or considering leaving by mode of transport	189
6.7	Reason for leaving or considering leaving by occupational group	190
6.8	Propensity to leave because of the journey to work by occupational group	191
6.9	Propensity to leave because of the journey to work by income	193
6.10	Propensity to leave because of the journey to work by gender	194
6.11	Propensity to leave because of the journey to work by housing tenure	195
6.12	Propensity to leave because of the journey to work by household situation	196
6.13	Propensity to leave because of the journey to work by age band	198
6.14	Uni-variate logistic regression models of leave propensity	203
6.15	Forward stepwise multiple logistic regression leave propensity model	205
6.16	Impact of the mode of travel to work of the firm relocations	209
7.1	Commutes prior to moving of movers and non-movers	227
7.2	Firm relocation induced change in commute of movers and non-movers	228
7.3	Commutes prior to moving by type of move	229
7.4	Firm relocation induced change in commute by type of move	230

7.5	Summary of outcomes of testing hypotheses five to nine	231
7.6	Reasons for moving house	233
7.7	Move propensity by current housing tenure	237
7.8	Change in housing tenure associated with migration	238
7.9	Move propensity by occupational group	239
7.10	Move propensity by mode of travel to work	240
7.11	Uni-variate logistic regression models of commute-shortening move propensity	245
7.12	Multiple logistic regression model of commute-shortening move propensity	247
8.1	Mean commutes of retained staff and new recruits to the firms' new sites, by occupational group	257
8.2	Job search channels of new recruits and leavers	263

PART I - BACKGROUND

1. INTRODUCTION

2. THE SPATIAL DISTRIBUTION OF UNEMPLOYMENT WITHIN METROPOLITAN AREAS

3. UNDERSTANDING THE SPATIAL DISTRIBUTION OF UNEMPLOYMENT WITHIN METROPOLITAN AREAS

1. INTRODUCTION

1.1 Introduction

Unemployment is not evenly distributed within British metropolitan areas, and metropolitan areas as a whole have had higher unemployment rates than other areas since the 1930s (Gordon, 2002). Consequently, some of the highest unemployment rates found in Britain, and in other advanced economies, especially in the US, can be found in metropolitan neighbourhoods. This is particularly true of neighbourhoods within the cores of metropolitan areas (Massey, 1996). Such neighbourhoods also tend to have a high incidence of many socio-economic and social problems associated with unemployment such as low income, economic inactivity, long-term sickness, poor health, lone parenthood, poor quality housing, crime, drug misuse and low educational attainment (Wilson, 1987; Byrne, 1995; Lawless, 1995; Webster, 1997a; Nazroo, 1998; Downs, 1999; DETR, 2000a).

Despite considerable spatial variation in unemployment rates between and within regions, and between and within metropolitan areas, policies to address unemployment in Britain are generally designed at the national level. For example, the current national Welfare-to-Work programme, which seeks to enhance the skills and employability of the long-term unemployed, is assumed to be appropriate in both high and low unemployment areas. However, this policy may not necessarily be appropriate in areas which have experienced significant decline in employment opportunities, such as the metropolitan cores, which experience high unemployment rates (Turok and Webster, 1998; Peck, 1999).

An analysis of the spatial manifestation of unemployment may aid understanding of its causes more generally, as well as possible remedies. Furthermore, space *itself* may be part of the *cause* of unemployment in some instances, rather than unemployment simply displaying a spatially uneven manifestation, but being caused by other, non-spatial, factors. It is therefore important to understand the spatial distribution of unemployment within metropolitan areas.

Unemployment and associated socio-economic problems are thought to be exacerbated and reinforced by their spatial concentration (Benabou, 1994). The spatial concentration of unemployment and poverty, particularly in some neighbourhoods within metropolitan cores, has long been recognised by policy-makers in Britain. For example, many urban regeneration initiatives take an 'area based' approach (Chatterton and Bradley, 2000). In addition, Employment Zones have been recently established in a number of larger geographical areas which face particularly high unemployment rates, including some metropolitan cores, for example Birmingham, Glasgow, Liverpool and a number of inner London Boroughs.

1.2 The spatial distribution of unemployment within metropolitan areas

Generally, unemployment rates are higher in the cores of metropolitan areas than in their rings. This general pattern is true in metropolitan areas in Britain, Australia, much of northern Europe, Japan, and the US (Sorensen, 2000). For similar patterns of unemployment to exist in the metropolitan areas of several different countries, powerful economic, spatial and social processes are likely to be at work.

The metropolitan areas of these countries generally conform to an urban structure of declining urban density with distance from the centre. First, there is a Central Business District (CBD) at the geographical centre of the metropolitan area. This is popularly known as the city centre in Britain or 'downtown' in the US. Next, there is a high density zone of mixed residential and industrial land use, known as the inner city in Britain, and the 'central city' in the US. Moving out from here, as a *general* rule, urban density declines, residents' incomes rise, and unemployment rates fall. The 'core' of a metropolitan area throughout this thesis refers to the CBD and the inner city, plus a broader surrounding high density area which is predominantly residential, but housing a greater variety of income groups than the inner city, and generally having a lower rate of unemployment. Outside the 'core' lies a lower density built-up area, referred to as the 'ring' throughout this thesis. The 'ring' generally includes suburbs housing residents of higher average income and lower risk of unemployment; secondary centres; and, increasingly, industry.

This concentric pattern is modified by the physical geography and infrastructure of particular metropolitan areas, and numerous individual developments which lie outwith their 'normal' location within the overall urban structure. In addition, larger metropolitan areas in particular tend to be polycentric, often having significant secondary 'cores' within an overall larger core/ring structure.

Although most metropolitan cores tend to have higher unemployment rates than their rings, there can be significant variation at a finer geographical scale in unemployment rates within this broad core/ring pattern. For example, most British metropolitan areas have peripheral social housing estates with high rates of unemployment on the edges of their cores. In addition, although many neighbourhoods in the 'inner city' immediately surrounding the CBD experience some of the highest unemployment rates found in British metropolitan areas, there are examples of other neighbourhoods in this 'inner city' zone with low unemployment rates and higher average incomes.

1.3 Understanding the spatial distribution of unemployment within metropolitan areas

What does research reveal about the causes of the spatially uneven distribution of unemployment within metropolitan areas? Conventional understanding of unemployment emphasises the lack of skills held by the unemployed generally, and the poor skills profile of disadvantaged neighbourhoods in particular. This can be described as the 'skills mismatch' perspective. It argues that there is a mismatch between the skills held by the unemployed and the skills demanded by employers in the modern economy. In the spatial context, residents of metropolitan cores, for example, are generally less able to compete for city centre jobs than in-commuters from the ring (Cohn and Fossett, 1996; Zhang, 1998).

The skills mismatch perspective accounts for the uneven spatial distribution of unemployment within British metropolitan areas by arguing that people with characteristics which disadvantage them in competing for jobs become concentrated in certain parts of metropolitan areas by the housing market (Cheshire, 1979). Different socio-economic groups are segregated within British metropolitan areas (Green, 1995),

and there is particular segregation between private and social housing (Forrest and Murie, 1994). In addition, the system of allocating people to social housing plays a further role in concentrating together disadvantaged people *within* the social rented sector (Lee, 1994).

The skills mismatch view of urban unemployment has been criticised for failing to consider the deconcentration¹ of jobs from metropolitan cores in the US (Ihlanfeldt and Sjoquist, 1998) and in Britain (Turok and Webster, 1998). The 'spatial mismatch' perspective argues that there is a spatial mismatch between where the unemployed live and where job opportunities exist within metropolitan areas. According to this perspective, unemployment rates in the cores of metropolitan areas are higher than in the rings because there has been a deconcentration of jobs within metropolitan areas over recent decades, and there are impediments to the residential mobility of some residents of metropolitan cores, and to the distance over which people commute and search for lower-paid jobs (Kain, 1968; Fieldhouse and Gould, 1998; McQuaid et al, 2001). Recent research in Britain has shown that poor access to public transport contributes to social exclusion, particularly among the unemployed (DETR, 2000b). The spatial mismatch perspective, in conjunction with skills mismatch, offers a more complete explanation of the spatial distribution of unemployment within metropolitan areas than the skills mismatch perspective alone.

Relatively little direct empirical evidence has been presented in relation to the importance of spatial mismatch in explaining the pattern of unemployment within metropolitan areas in Britain. In contrast, much empirical work has been carried out in relation to this in the US. This work revolves around the 'spatial mismatch hypothesis', and generally tests the relative importance of 'skills mismatch' and 'spatial mismatch'.

The spatial mismatch hypothesis argues that African Americans are less residentially mobile than whites due to lower income and racial discrimination in suburban housing markets, and therefore African Americans are less able to migrate to the suburbs in

¹ 'Deconcentration' refers to a reduction over time of the proportion of the jobs or population in a metropolitan area located in the core.

order to be within commuting distance of suitable job opportunities (Ihlanfeldt and Sjoquist, 1998). Commuting barriers arise due to the large distances between central city and the suburbs, such 'reverse' commuting being served poorly by public transport (Pugh, 1998), and low car ownership among central city residents (Taylor and Ong, 1995; Shen, 1998). In addition, job search and recruitment practices may present central city residents with difficulties in accessing information about suburban job vacancies because of localised methods of advertising and recruitment, such as word-of-mouth and advertisements placed on the factory gate, in local shops or with local employment exchanges (Immergluck, 1998a).

Opponents of the spatial mismatch hypothesis argue that ethnic minority groups lack the requisite skills to compete for jobs (Cohn and Fossett, 1996; Zhang, 1998). It is also argued that African Americans suffer racial discrimination by employers (Ellwood, 1983). However, in Britain, white people also experience, on average, higher unemployment in the cores of metropolitan areas, and the cores of British metropolitan areas are not dominated by ethnic minority groups to the same extent as the central city is in US metropolitan areas (Nazroo, 1998). However, racial disadvantage and spatial segregation are not insignificant in some British metropolitan areas, particularly Birmingham and London (Phillips, 1998).

Although the issues surrounding urban unemployment in Britain are slightly different to the US context in which the spatial mismatch hypothesis has been developed, there are important common themes. First, the deconcentration of employment, particularly lower-skilled and manual employment, from British metropolitan cores has been substantial (Begg et al, 1986; Turok and Edge, 1999), as it has been in the US (Kasarda, 1990). Second, tenants in British social rented housing are segregated from residents in other housing tenures (Forrest and Murie, 1994) and face considerable administrative barriers to moving house (Minford et al, 1987), which forms a parallel with racial segregation in US metropolitan housing markets. Furthermore, a high proportion of households in British metropolitan cores live in social rented housing (Keenan et al, 1999). This does not imply, however, that people in other housing tenures do not face

spatial barriers to employment within metropolitan areas, including constraints on their residential mobility.

Finally, job search and recruitment practices may present a further spatial barrier to employment within British metropolitan areas. Information about job vacancies in different parts of metropolitan areas may become more difficult to obtain as the distance between job searcher and job vacancy increases. As in the US, advertising and recruitment may be localised, and people may not search for work across the whole of a metropolitan area. In addition, state run Job Centres in Britain may also further act to restrict the availability of job vacancy information across space by only placing on visual display local jobs, and by encouraging job seekers and employers to rely on their local Job Centre to find out about and advertise work (Bohlm and Taylor, 2001).

These common themes apart, recent evidence in the US suggests that the spatial mismatch hypothesis applies not only to ethnic minorities but also to white manual workers (for example, Ihlanfeldt and Sjoquist, 1990; Kasarda, 1990). The affordability and availability of suitable housing in the suburbs (Cooke and Shumway, 1991), and family and neighbourhood ties (Kasarda, 1990) are likely to pose considerable barriers to lower income households migrating, irrespective of race. In the British context, such financial (Meen, 1996) and social (Molho, 1995) barriers are also likely to exist, irrespective of housing tenure.

It should be noted that the skills mismatch and spatial mismatch perspectives on the spatial distribution of unemployment within metropolitan areas are not mutually exclusive. The changing location of jobs may influence the spatial distribution of unemployment while simultaneously housing markets segregate people according to a number of characteristics associated with their skills and employment status.

The spatial mismatch hypothesis has merit in being applied to a metropolitan area in Britain because the US literature provides considerable empirical evidence and theoretical and methodological discussion which have been lacking in Britain in relation to the importance and nature of spatial mismatch and spatial barriers to employment

within metropolitan labour markets. Furthermore, the findings of research into the spatial mismatch hypothesis in the US have produced mixed conclusions, and thus the hypothesis remains contested. In addition, the precise mechanisms by which space presents a barrier to employment within metropolitan labour markets remain largely unexplored, particularly the importance and nature of commuting, residential mobility and job search/recruitment (Ihlanfeldt and Sjoquist, 1998; Immergluck, 1998a).

1.4 Aim, contribution and approach

The aim of this thesis is to test the spatial mismatch hypothesis in a British metropolitan area. More specifically, this thesis assesses the relative importance of commuting, residential mobility, and job search/recruitment as spatial barriers to employment within the Glasgow conurbation. The nature and magnitude of these spatial barriers for different groups within the workforce are also investigated. In more detail, the specific research objectives of this thesis are:

- 1) to establish whether there are commuting constraints within metropolitan areas which cause some people to become unemployed;
- 2) to establish whether there are constraints on residential mobility within metropolitan areas which prevent some people from migrating to be closer to suitable jobs; and
- 3) to establish if job search and/or recruitment processes present spatial barriers to employment within metropolitan areas.

The Glasgow conurbation is a metropolitan area in west central Scotland, which in 1991 had a population of just under 1.6 million people² and 627,000 jobs located within it (Turok and Edge, 1999). It has experienced considerable employment deconcentration during the post-war era, particularly of manual and lower-skilled jobs (McGregor and McConnachie, 1995), and displays significant spatial variation in unemployment rates. Overall, unemployment rates are higher in Glasgow City (corresponding to the core of the conurbation) than in the ring. The proportion of households in social rented accommodation, and the proportion without a car, are overall both higher in Glasgow

² Source: Census of Population

City than in the ring of the conurbation. These factors suggest that spatial mismatch may contribute towards the spatial pattern of unemployment found within the conurbation.

This thesis makes six original contributions. First, it provides a new critique of the skills and spatial mismatch perspectives. Second, it applies to a British metropolitan area the spatial mismatch hypothesis which has been developed largely in the US. Third, it provides a detailed critique of methods used previously to test the spatial mismatch hypothesis. Fourth, it brings new empirical evidence to bear on the contested spatial mismatch hypothesis. Fifth, it investigates the significance of three different types of spatial barrier to employment within the Glasgow conurbation, whose importance relative to each other remains largely unexplored in existing literature.

Finally, it develops the little-used methodology of examining the impact of firm relocations on workers. This provides richer information than has hitherto been achieved, both on the processes operating within metropolitan labour markets and on the nature of spatial barriers to employment. This methodology also addresses some of the specific methodological criticisms that can be made of much previous research into the spatial mismatch hypothesis.

1.5 Structure of thesis

The remainder of this thesis is organised in four parts. The remaining two chapters (chapters two and three) of the first part of the thesis provide background description and explanation of the spatial distribution of unemployment within metropolitan areas, mainly focused on Britain. After highlighting the shortcomings of the skills mismatch perspective when applied to the spatial distribution of unemployment within metropolitan areas, a critical examination of the spatial mismatch hypothesis is made, identifying its main strengths and weaknesses and the key assumptions on which it is based. A conceptual framework is developed in which to locate the spatial mismatch hypothesis, by relating it to broader theories of urban form and of labour markets.

The second part of this thesis (chapters four and five) outlines previous methods used to test the spatial mismatch hypothesis, highlighting their weaknesses. The firm relocation approach is identified as a means to address these weaknesses, and to examine the three specific spatial barriers to employment within metropolitan areas which this thesis aims to assess. Ten specific hypotheses to be tested are developed. The ideal data requirements to test these hypotheses are then outlined, and the data actually available described. Choices made in the execution of the research are then explained and reflected upon.

The third part of the thesis (chapters six, seven and eight) presents the empirical findings of the research in relation to each of the ten hypotheses, along with qualitative findings from interviews with workers affected by the firm relocations. These three chapters present findings in relation to commuting, migration and job search/recruitment respectively, as spatial barriers to employment within the Glasgow conurbation. Multi-variate analysis is carried out in order to identify, *ceteris paribus*, which groups of people are most affected by spatial barriers to employment within the Glasgow conurbation.

The concluding part of the thesis (chapters nine and ten) discusses the theoretical and policy implications of the empirical work carried out. The findings are compared against those of previous research. The robustness of the findings, the effectiveness of the methodology and possible alternative interpretations of the results are then considered. Some reconciliation is made between the skills and spatial mismatch perspectives in explaining the spatial distribution of unemployment within metropolitan areas. Remaining gaps and uncertainties in knowledge, and questions raised by this work, are identified for future research attention.

2. THE SPATIAL DISTRIBUTION OF UNEMPLOYMENT WITHIN METROPOLITAN AREAS

2.1 Introduction

Metropolitan areas in many developed countries display considerable spatial variation in neighbourhood unemployment rates. As a *general* rule, neighbourhood unemployment rates are higher towards the centre of metropolitan areas. This overall pattern is particularly prevalent in metropolitan areas in Britain, Australia, much of northern Europe (particularly Germany and Sweden), Japan, and the US (Sorensen, 2000). Not only is there spatial variation in unemployment rates, but also in the associated socio-economic and social problems outlined at the start of the previous chapter.

Certain neighbourhoods, often in the inner parts of metropolitan areas, but also elsewhere, experience particularly concentrated unemployment. It is thought that spatially concentrated unemployment gives rise to greater social problems than spatially dispersed unemployment. Due to people's personal network of contacts being more likely to be with other people who are unemployed in the scenario of concentrated unemployment, residents' employment aspirations and expectations decline (O'Regan, 1993). It is also thought that spatially concentrated unemployment can make re-entering the labour market more difficult for individuals because they become dislocated from information networks which may enable them to find out about, and be recommended for, job vacancies (O'Regan and Quigley, 1998). The spatial concentration of poverty can also reduce spending on local services and on housing maintenance and improvements by individuals, as well as deterring commercial investment, thus causing neighbourhoods to experience environmental deterioration and further social problems (Megbolugbe et al, 1996). For these reasons, urban unemployment, including its spatial manifestation, is of considerable policy concern in Britain (DETR, 2000a).

It should be noted that there are also differences in unemployment rates between countries, and between regions within countries, but that differences within regions and within metropolitan areas are greater (Green and Owen, 1998). This thesis limits itself to the consideration of the spatial distribution of unemployment within metropolitan

areas because it is the topic of a contested theoretical debate, and urban unemployment is of considerable policy concern in Britain and elsewhere. Although the theoretical discussion presented in this thesis is largely applicable beyond Britain, the empirical work is based in the Glasgow conurbation within Britain, and reference to government policies is restricted to the British context.

This chapter provides a brief description of the spatial distribution of unemployment rates within the largest metropolitan areas in the US and Britain, and discusses employment deconcentration within British metropolitan areas. This is intended to set the scene for the following chapter which outlines possible explanations of these observed patterns of unemployment. Policy responses to unemployment in Britain are outlined, and broader urban policy discussed. The relevance of current transport policies to urban unemployment is also considered.

2.2 The spatial distribution of unemployment within US metropolitan areas

This section describes the spatial pattern of unemployment rates within metropolitan areas in the US, where the spatial mismatch hypothesis has been developed.

‘Metropolitan area’ refers to mostly contiguous built-up areas which provide important economic, administrative, service and cultural activities to a functional region extending far beyond the contiguous built up area (Parr, 1997). Because of these important functions, despite many metropolitan areas in both the US and in Britain having lost significant proportions of their populations during the twentieth century, they are likely to remain significant urban centres for some time hence (Lever, 1993).

Metropolitan areas in the US have large differentials between central city and suburban unemployment rates. Table 2.1 shows the 1990 unemployment rates found in the central cities and suburbs of the eight largest metropolitan areas in the US, and the ratio between them. The rows in the table have been ranked in descending order of the ratio between the central city and suburban unemployment rate.

Table 2.1 Unemployment rates in eight US metropolitan central cities and suburbs, 1990

Metropolitan area	Unemployment rate (% of economically active)		Central city:suburb ratio
	Central city	Suburbs	
Detroit	17	6	2.8
Chicago	11	4	2.8
Philadelphia	10	4	2.5
Baltimore-Washington	7	3	2.3
New York County	9	5	1.8
Dallas-Fort Worth	7	5	1.4
Los Angeles	6	5	1.2
San Francisco-Oakland	8	7	1.1

Source: Derived from Hughes and Loizillon (1999)

The unemployment rates found in the central cities of Detroit, Chicago, Philadelphia and Baltimore-Washington are all more than double those found in their suburbs. In all eight of the largest metropolitan areas in the US, the unemployment rate in the central city exceeds that in the suburbs.

There is variation in the strength of this general core/ring pattern between the different metropolitan areas in table 2.1. For example, the 'Rust Belt' cities of the north-east tend to have greater differences between central and suburban unemployment rates than Dallas-Fort Worth, Los Angeles and San Francisco-Oakland in the south. In addition, there are many significant pockets of high unemployment in suburban areas within US metropolitan areas (Wilson, 1987; Cooke, 1996).

2.3 The spatial distribution of unemployment within British metropolitan areas

There is also considerable spatial variation in unemployment rates found within British metropolitan areas. As in the US, the cores of British metropolitan areas generally experience higher unemployment than the rings. In 2000, over the eight metropolitan

areas in Britain, 8.9% of the workforce in the cores was ILO unemployed³ compared to 6.4% in the rings. This compares to an ILO unemployment rate at this time of 5.4% for the whole of Great Britain. So, although the eight metropolitan rings overall have an unemployment rate lower than the cores, this figure is higher than the national unemployment rate.

Some inner city neighbourhoods experience particularly high rates of unemployment and associated socio-economic and social problems. Neighbourhoods with particularly acute problems within some of Britain's metropolitan areas are notorious across the whole country. For example, many people throughout Britain have heard of the Gorbals in Glasgow, Moss Side in Manchester and Tower Hamlets in London.

The unemployed are more segregated from the rest of the population in metropolitan areas and cities in Britain than in other types of area. Furthermore, this spatial concentration of the unemployed and economically inactive increased throughout the 1980s within Britain's largest cities (Green, 1994a).

Table 2.2 shows the unemployment rates found in the cores and rings of each of the eight British metropolitan areas, and the ratio between the two. The spatial distribution of unemployment rates at a finer geographical resolution within the Glasgow conurbation is examined in chapter four.

The eight metropolitan areas in Britain are: the Glasgow conurbation; Greater London; Greater Manchester; Merseyside centred on Liverpool; South Yorkshire centred on Sheffield; Tyne and Wear centred on Newcastle upon Tyne; West Midlands centred on Birmingham; and West Yorkshire centred on Leeds.

³ Source: Labour Force Survey. The ILO definition of unemployment requires an individual to have looked for work in the previous four weeks and to be able to start work within a fortnight.

Table 2.2 Unemployment rates in British metropolitan cores and rings, 2000

Metropolitan area	Unemployment rate (% of economically active)		Core:ring ratio
	Core	Ring	
Greater Manchester	7.8	4.6	1.7
West Midlands	11.0	6.7	1.7
Greater London	9.3	5.8	1.6
Glasgow conurbation	10.5	7.4	1.4
Tyne and Wear	12.6	9.1	1.4
Merseyside	10.0	7.5	1.3
South Yorkshire	6.6	7.3	0.9
West Yorkshire	4.5	7.1	0.6

Source: Derived from Labour Force Survey

Note: 'Unemployment' refers to the ILO definition

Six of the eight British metropolitan areas had higher unemployment rates in their cores than in their rings in 2000. The differentials between core and ring in these six are substantial, the ratio of the core to ring unemployment rates being 1.7 in both Greater Manchester and the West Midlands conurbation, 1.6 in Greater London, 1.4 in both the Glasgow conurbation and in Tyne and Wear, and 1.3 in Merseyside. These core to ring ratios are lower than those of the US 'Rust Belt' cities presented in the previous section, but are comparable to those of New York County and the southern US metropolitan areas⁴.

Interestingly, both the South and West Yorkshire conurbations have *lower* unemployment rates in their cores than in their rings. Both cases can be partially explained by the polycentric urban structure of these metropolitan areas, particularly the influence of Bradford in the 'ring' of West Yorkshire, and of Doncaster and Rotherham in the 'ring' of South Yorkshire. Bradford, Doncaster and Rotherham are sizeable

⁴ The overall higher core:ring ratios in unemployment rates in the US metropolitan areas than in the British metropolitan areas may partly be due to the definition of metropolitan areas in the two countries. In the US, the cores and rings constitute functionally defined areas which combine to form a Standard Statistical Metropolitan Area (SSMA), whereas in Britain, metropolitan cores and rings are based on the administrative boundaries of local authorities. Therefore, data relating to the British metropolitan cores and rings are likely to correspond less closely to functional cores and rings than the US data.

towns with high unemployment which have suffered substantial employment decline themselves. As such, they can in some respects be considered to be part of non-contiguous economic 'cores' of these two metropolitan areas. In addition, the boundary of Leeds incorporates affluent suburbs more typical of a metropolitan ring.

There are exceptions to the general pattern of high unemployment in metropolitan cores and lower unemployment in the rings. Most metropolitan areas have at least one affluent neighbourhood within their functional inner urban area, for example the West End of Glasgow and Didsbury in Manchester.

Conversely, many British metropolitan areas have 'peripheral' public housing estates which, although not usually in the outermost parts of metropolitan areas, are often a considerable distance from the 'inner city' and may be located close to more affluent suburban areas (McGregor, 1977; Duffy, 1992). Most of these are the product of the policy of decentralisation of population from overcrowded slums in the metropolitan cores during the 1950s and 1960s (for details of this in the Glasgow conurbation, see Abercrombie and Matthew, 1949). In addition, the polycentric nature of many British metropolitan areas means that the 'cores' of smaller settlements which have been subsumed by the sprawl of the overall metropolitan area become pockets of high unemployment in metropolitan rings, for example the industrial towns surrounding Glasgow, and the mill towns surrounding Leeds and Manchester.

Although numerous, these are the exceptions rather than the rule, and these towns are generally small in relation to the metropolitan cores. Table 2.2 showed that the core/ring model of high/low unemployment rates can be applied to the general pattern of unemployment in most British metropolitan areas. Therefore, it provides a useful framework in which to begin to conceptualise the spatial nature of unemployment in British metropolitan areas.

That said, there could in theory be a spatial mismatch between the unemployed and suitable job vacancies within *any* urban structure. For example, a polycentric metropolitan area with no core/ring structure whatsoever could still have spatial

variations in the proximity of jobs to different neighbourhoods, resulting in spatial variation in unemployment rates.

2.4 Employment deconcentration within British metropolitan areas

The employment base in the cores of the eight British metropolitan areas has declined throughout the post-war era while their rings have fared more favourably (Begg et al, 1986; Turok and Edge, 1999). This is consistent with the 'spatial mismatch' explanation of geographical variation in unemployment rates within metropolitan areas.

This trend continues, with the metropolitan cores losing 9.2% of their employment base between 1984 and 1993⁵, while the number of jobs in the rings declined by only 3.3% (Turok and Edge, 1999)⁶, representing strong relative employment deconcentration during this period. During this time, employment in the whole of Britain grew by 1.2%.

The decline in manufacturing, manual and lower-skilled employment over the same period in the metropolitan areas was substantially greater than the decline in total employment. Between 1984 and 1993, manufacturing employment declined by 28.4% in the eight metropolitan areas as a whole compared to a 6.4% decline in total employment. Indeed, throughout the post-war period, the cores of metropolitan areas have experienced greater proportionate declines in manufacturing employment than the rings (Turok and Edge, 1999). Consequently, workers in manufacturing, manual and lower-skilled employment face a greater deconcentration of suitable employment opportunities than workers in other sectors.

The core:ring ratios in current unemployment rates in each of the British metropolitan areas presented in the previous section are closely associated with the degree of recent employment deconcentration in each metropolitan area. The six metropolitan areas with higher unemployment in their core than in their ring have all experienced recent employment deconcentration, while the remaining two with higher unemployment in

⁵ These years were chosen because they represent comparable points in the national economic cycle, since they both lie at 'troughs'. The change between these points therefore represents the long term underlying trend in employment change, uninfluenced by short term fluctuation as a result of the national economic cycle.

their rings than in their cores, have both experienced a recent *reconcentration* of employment.

The change between 1984 and 1993 in the number of jobs in each metropolitan core, and the extent of employment concentration or deconcentration between these years in each metropolitan area, are shown in table 2.3. The final column in the table entitled '*concentration change*' shows the extent of employment concentration or deconcentration over this period, expressed as the percentage change in the proportion of all jobs in each metropolitan area which are located in the core.

Between 1984 and 1993, Merseyside suffered the greatest proportionate decline in employment in its core, with the total number of jobs in Liverpool falling by 14.1% from 220,000 to 189,000. This was followed closely by the decline in inner London of 13.0%. Employment decline in other metropolitan cores ranged from 5.9% in Manchester to 9.1% in Birmingham at the heart of the West Midlands conurbation. The employment base in the core of Tyne and Wear (Newcastle) grew marginally during this period, and the employment base in Leeds, representing the core of the West Yorkshire conurbation, grew by 7.1% from 295,000 to 316,000.

The strong growth in Leeds and the marginal growth in Newcastle in *total* employment masks declines in manufacturing, manual and lower-skilled employment (Turok and Edge, 1999). Indeed, as noted previously, the decline in total employment in the other British metropolitan areas masks greater declines in the number of opportunities in manufacturing, manual and lower-skilled employment. Therefore, the reduction in availability of suitable jobs to manual and lower-skilled workers in these categories who reside in the metropolitan cores is understated by these figures which relate to all jobs.

In relation to employment deconcentration, in other words the performance of the cores relative to the rings, Greater Manchester experienced the greatest percentage decline in the core's share of total metropolitan employment, falling from 30.3% to 28.5% of total employment, a rate of 6.0%. The Glasgow conurbation experienced the next greatest

⁶ Using the Census of Employment/ Annual Employment Survey.

level of employment deconcentration, with the core's share of total employment falling from 55.2% to 53.0%, a rate of 3.8%. This is followed by Merseyside falling at a rate of 3.3%, the West Midlands at a rate of 3.2% and Greater London falling at a rate of 2.4%. Tyne and Wear experienced only marginal employment deconcentration, with very low growth in Newcastle slightly outstripped by low growth in the ring. South Yorkshire experienced a very slight reconcentration of employment, while West Yorkshire was the only metropolitan area to experience significant reconcentration, with the proportion of jobs located in the core rising from 41.7% to 42.9% of the metropolitan total.

Table 2.3 Employment change in British metropolitan areas, 1984-93

Metropolitan area	Employment in core (000s)		Employment change (%)	Concentration (core jobs as % of all jobs in metro. area)		Concentration change (%)
	1984	1993		1984	1993	
Glasgow conurbation	348	322	-7.5%	55.2	53.0	-3.8%
Greater London	2,005	1,744	-13.0%	57.9	56.5	-2.4%
Greater Manchester	270	254	-5.9%	30.3	28.5	-6.0%
Merseyside	220	189	-14.1%	53.3	51.5	-3.3%
South Yorkshire	218	205	-6.0%	73.9	74.0	0.1%
Tyne and Wear	153	154	0.7%	47.4	47.1	-0.6%
West Midlands	474	431	-9.1%	49.1	47.6	-3.2%
West Yorkshire	295	316	7.1%	41.7	42.9	2.9%

Source: Derived from Turok and Edge (1999) using the Census of Employment/ Annual Employment Survey.

Table 2.2 in the previous section showed that the South and West Yorkshire conurbations atypically both had higher unemployment rates in their rings than in their cores. Rather than raising a question over the relevance of the changing location of jobs within metropolitan areas in explaining the pattern of unemployment, in light of the reconcentration of employment in both these metropolitan areas shown in table 2.3, this finding actually reinforces it. These are the only two British metropolitan areas where employment deconcentration has *not* taken place (at least in the period 1984-93 – the decline of employment in Sheffield prior to this was substantial (Begg et al, 1986)).

This reversal in the broad spatial pattern of unemployment rates in these two metropolitan areas is therefore entirely consistent with the 'spatial mismatch' explanation of the spatial distribution of unemployment within metropolitan areas.

The figures for South and West Yorkshire conurbations should not be taken to mean that the deconcentration of employment has not been a dominant and ubiquitous trend in large urban areas in Britain. As noted in the previous section, the polycentric nature of these metropolitan areas accounts for their unusual 'core' and 'ring' patterns in unemployment rates and change in workplace-based employment. If Bradford, Doncaster and Rotherham were considered to be separate free-standing urban centres, then each sub-centre would most likely confirm to more typical core/ring patterns in unemployment rates and employment deconcentration (although the data required to show this in inter-censal years are not available at a sufficiently fine-grained geography).

This section has illustrated empirically the extent of employment deconcentration within British metropolitan areas. The impact of employment deconcentration in relative terms has been reinforced by substantial decline in employment opportunities in absolute terms, especially of manufacturing, manual and lower-skilled jobs in the metropolitan cores. There is a broad association between the extent of employment deconcentration and the core/ring differential in unemployment rates within each metropolitan area. This is consistent with the spatial mismatch hypothesis.

Although two of the eight metropolitan areas have *not* experienced recent employment deconcentration, these are the only two metropolitan areas not to conform to the typical pattern of higher unemployment in the core than in the ring. Furthermore, this phenomenon can be explained in both these metropolitan areas by their polycentric urban structure. This is consistent with the spatial mismatch view of urban unemployment. In each of the eight British metropolitan areas, recent change in the location of jobs is correlated spatially with the current pattern of unemployment rates.

2.5 Policies influencing the spatial distribution of unemployment within British metropolitan areas

Despite the prevalence of economic and social problems in British metropolitan cores, as well as in other types of urban area, a coherent urban policy is lacking (Atkinson and Moon, 1994). However, a number of policies, including what has been loosely termed 'urban policy' for the purposes of this discussion, impinge directly upon urban areas. This sections of this chapter considers four such policy areas: urban regeneration initiatives; urban policy; policies to deal with unemployment; and transport policy.

2.5.1 Urban regeneration initiatives

Urban regeneration policies in Britain are aimed at tackling some of the most deprived areas within towns and cities. It is thought that concentrating investment in certain areas and co-ordinating regeneration across different sectors such as housing, training, recreation and health can reap greater rewards; the whole is greater than the sum of the parts (McGregor et al, 1992). However, schemes of the 1980s and 1990s have been criticised for concentrating on physical renewal and making only modest social and economic improvements to the lives of those who live there, for example in terms of tackling unemployment (Carley, 1998). This criticism includes the New Life for Urban Scotland Partnerships (Cambridge Policy Consultants, 1999), the most recent urban regeneration initiative in Scotland to have been fully evaluated *post hoc*.

The area-based approach continues with the recent creation of the New Deal for Communities initiative in England, and Social Inclusion Partnerships in Scotland, both of which seek to tackle a range of physical, social and economic problems found in disadvantaged neighbourhoods, including unemployment (Social Exclusion Unit, 1998; Scottish Executive, 1999). In more recent years, training schemes and business start-up advice/grants have been integral parts of urban regeneration schemes (Nevin, 1999). However, direct job creation, which the spatial mismatch view of urban unemployment suggests would be effective in combating unemployment, has always lain outwith the remit of area-based regeneration (Mossberger and Stoker, 1997; Webster, 1997b).

2.5.2 Urban policy

Urban policies designed to deal with the economic, social and environmental well-being of urban areas as a whole, have been criticised for not tackling economic and employment decline in urban centres (Turok, 1999). An exception to this is the series of Urban Development Corporations (UDCs) which operated in England and Wales, mainly throughout the 1990s (Jones, 1996). The UDCs brought considerable resources to bear on the rehabilitation of derelict land, infrastructure works and the economic development of run-down urban areas, including metropolitan cores, for example the London Docklands and in Liverpool (Turok, 1987).

In England, and to a lesser extent in other parts of Britain, two issues currently dominate urban policy, and planning policy more generally. The first is the perceived environmental benefit of building on brown-field sites within existing urban areas rather than on green-field sites. The second is the projected large increases in the number of households. This latter issue is of more general land use planning concern, but has a strong influence on urban policy. These two issues have been combined in the approach taken to urban policy and planning at present, as illustrated by the report of the Urban Task Force (1999), the Urban White Paper (DETR, 2000a) and PPG3 Housing (DETR, 2000c), all of which recommend that, as far as possible, new housing development should take place on brown-field land in larger urban settlements. This approach has been criticised for failing to consider where people will work if they move to metropolitan cores (Breheny, 1999), and also for not addressing the importance of employment opportunities in achieving, in the words of the recent Urban White Paper, an 'urban renaissance' (Champion, 1999; Hall, 1999; Turok, 1999; Hall, 2001; Turok, 2001).

2.5.3 Policies to deal with unemployment

The centrepiece of the New Labour government's approach to tackling unemployment is the Welfare-to-Work programme, in particular the set of New Deal initiatives. The largest of these is aimed at the under 25 year-old long-term unemployed (those unemployed for more than six months). The conceptual basis of this policy is that the long-term unemployed have become unemployable due to long periods out of work and

a lack of basic work skills, and in some cases personal 'life' skills (Peck, 1999).

Therefore, the policy seeks initially to provide advice on how to secure a job through the 'Gateway' stage of the scheme which aims to enhance job search skills and increase the intensity of job search undertaken by the long-term unemployed. If this is unsuccessful, then the individual is placed in one of the following: a subsidised job with an employer; training or education; a voluntary sector role; or a position within the Environmental Task Force, which was established specifically for the New Deal.

However, the New Deal is applied in the same manner across the whole country, irrespective of the level of unemployment found in different areas. It is a purely supply side measure, based on the notion of 'skills mismatch' causing unemployment. It attempts to tackle the characteristics and behaviour of the unemployed to the exclusion of any consideration of the local availability of jobs. It does not consider possible shortfalls in the demand for labour in some local labour markets which have experienced economic decline over recent decades, such as metropolitan cores and former coal-mining areas (Turok and Webster, 1998; Beatty and Fothergill, 1999; Peck, 1999).

Employment Zones have been designated in some high unemployment areas, including Birmingham, Glasgow, Liverpool and a number of inner London Boroughs. The aims of Employment Zones are to enhance and 'bend' mainstream service provision, and increase flexibility in the local delivery of national policies, particularly the New Deal initiatives, to the benefit of particular areas (Simmons, 1998). Although recognising that the unemployment problem is more difficult to tackle in locations than others, Employment Zones simply respond to this by enhancing existing supply-side policies.

2.5.4 Transport policy

Given the deconcentration of jobs within metropolitan areas, transport mobility may be important in allowing people to gain access to employment. The public transport accessibility of new retail and housing developments has become a significant planning consideration throughout the 1990s, although this is much less the case with regard to new commercial and industrial developments (DETR, 2001).

The taxation levied on petroleum and diesel fuel in Britain is significantly higher than many other developed countries (Roberts et al, 1999). In addition, car insurance costs in disadvantaged neighbourhoods can be prohibitive (HM Treasury, 1999). These factors may mean that issues of 'spatial mismatch' between the location of jobs and the location of the unemployed within British metropolitan areas are compounded by low car ownership in areas with high rates of unemployment.

Local bus services in the UK were deregulated in 1986, but local authorities offer subsidies to private companies to operate 'social' routes, for example to hospitals or evening and Sunday services. However, nodes of employment such as industrial estates are rarely served by 'socially tendered' bus services (Allan, 1995).

The possible contribution of transport difficulties to social exclusion is increasingly being recognised by policy makers, with the Integrated Transport White Paper of 1998 emphasising the social, economic and environmental benefits of high quality, integrated transportation systems (DETR, 1998a). For example, a number of 'Wheels 2 Work' schemes whereby motor scooters are hired by job seekers to get to job interviews are spreading across Britain, as well as other schemes which seek to improve access to transport services of groups who have typically had low transport mobility such as the elderly, young people and people with mobility impairments (Enoch, 1999).

In addition, the Scottish Executive recently commissioned research into the measurement of accessibility, acknowledging the narrowness of the current emphasis on travel time savings in evaluating proposed transport investments (Halden et al, 2000). Similarly, the evaluation of proposed new trunk roads in England and Wales has already been changed to take more regard of the implications for accessibility, particularly for those without access to a car (DETR, 1998b).

2.6 Conclusion

Unemployment is generally concentrated in the cores of British metropolitan areas, and particularly so in some inner city neighbourhoods and other pockets within metropolitan

areas. It is generally held that this spatial concentration of unemployment contributes to, and reinforces, other social problems. Urban unemployment is therefore the source of considerable policy concern.

However, why is unemployment unevenly distributed within metropolitan areas?

Conventional understanding points toward the lower than average skills profile of the residents of metropolitan cores and of disadvantaged neighbourhoods. However, has the deconcentration of employment from metropolitan cores contributed to creating this pattern of unemployment rates? The importance and nature of 'spatial mismatch' in metropolitan labour markets is a source of some uncertainty, and is under researched, particularly in Britain. The following chapter identifies shortcomings with the skills mismatch explanation of the spatial distribution of unemployment within metropolitan areas, and critically examines the potential of the spatial mismatch hypothesis to enhance understanding.

3. UNDERSTANDING THE SPATIAL DISTRIBUTION OF UNEMPLOYMENT WITHIN METROPOLITAN AREAS

3.1 Introduction

There are many theories which seek to understand the reasons for different groups of *people* being more prone to unemployment than others. However, explanations of why different *places* have higher unemployment rates than others are less well developed, particularly at spatial scales below that of regions.

Perhaps the most prevalent labour market theory of unemployment is the view that there is a mismatch between the skills of the unemployed and the skills demanded by employers (for example, see Hawkins, 1987; Layard and Nickell, 1987; Budd et al, 1988; OECD, 1994; Holtham and Mayhew, 1996; Layard, 1997; and Manacorda and Petrongolo, 1999). However, the skills mismatch approach to understanding unemployment does not provide a direct explanation of why unemployment is unevenly distributed within metropolitan areas (or, indeed, unevenly distributed across space more generally). In addition, by focusing on the characteristics of the workforce, it does not consider the level of demand for labour (Peck, 1999; Turok and Webster, 1998; McQuaid, et al, 2001). The skills mismatch perspective also assumes that local labour markets have a high degree of internal fluidity, both in terms of occupational mobility and spatial mobility (Cheshire, 1979; Morrison, 2001).

It has been suggested that the deconcentration of jobs within metropolitan areas may be part of the cause of higher unemployment rates being found in their cores (Kain, 1968; Vipond, 1980, 1984; Hughes, 1989; Ihlanfeldt and Sjoquist, 1989, 1990; Kasarda, 1990; Webster, 1994; McLafferty and Preston, 1996; Thompson, 1997; Raphael, 1998; Thomas, 1998). In other words, there is a spatial mismatch between the residential location of the unemployed and the location of suitable jobs, and people face spatial frictions in accessing jobs within metropolitan areas. This notion has been termed the 'spatial mismatch hypothesis' and has received much research attention in the US, but remains under-researched in Britain.

This chapter briefly outlines the main shortcomings of the skills mismatch approach to explaining the spatial distribution of unemployment within metropolitan areas. The spatial mismatch hypothesis is identified as a means of addressing these shortcomings, while not denying the importance of skills mismatch. The chapter then traces the development of the spatial mismatch hypothesis in the US, before considering its relevance in the British context. The spatial mismatch hypothesis is then critically examined, and seven key assumptions behind the hypothesis are identified. Finally, a framework in which to conceptualise spatial mismatch within metropolitan areas is developed.

3.2 Skills mismatch in metropolitan areas

3.2.1 Outline of the skills mismatch perspective

Conventional wisdom, both in dominant academic understanding and among policy makers, in explaining unemployment emphasises the mismatch between the skills held by the unemployed and the skills demanded by most employers offering job vacancies in the modern economy (for example, see Hawkins, 1987; Layard and Nickell, 1987; Budd et al, 1988; OECD, 1994; Holtham and Mayhew, 1996; Layard, 1997; and Manacorda and Petrongolo, 1999). In accounting for the spatial distribution of unemployment within metropolitan areas in particular, the skills mismatch perspective highlights the fact that residents of metropolitan cores live in close proximity to a large number of jobs located in the city centre, but fail to compete for those jobs, losing out to higher skilled in-commuters from the rings (Metcalf and Richardson, 1976; Cheshire, 1979; Gordon, 1987; Hasluck, 1987; Garner et al, 1988; Gordon, 1988; Gordon et al, 1989; Robinson, 1991; Cohn and Fossett, 1996; Zhiang, 1998; Gordon, 2002).

Other perspectives on unemployment are related to the skills mismatch perspective in that they focus on the characteristics and behaviour of the unemployed themselves. For example, some authors stress the role of general 'employability' (Moss and Tilly, 1996), and the impact that long-term unemployment has on work 'readiness' (Main, 1981). As with the skills mismatch perspective, these approaches focus on the supply side of the labour market, i.e. the workforce. Other authors emphasise discrimination by employers in terms of gender (Bruegel and Perrons, 1996), race (Ellwood, 1983; Stewart, 1983),

class (Danziger and Gottschalk, 1987), or job applicants' addresses through the stigmatisation of certain neighbourhoods (McGregor, 1977). Although these introduce the influence of the behaviour of employers to understanding unemployment, they retain a strong focus on the characteristics of the workforce.

Most skills mismatch research addresses the level of unemployment nationally, or seeks to explain which groups of people are at greatest risk of unemployment. Indeed, qualifications, an important component of skills, and often used as a screening mechanism by employers, have a strong association with unemployment. In 1999, the unemployment rate in Britain of those with National Vocational Qualifications (NVQs) level four or above was 3.1%, compared to 6.1% of those with qualifications below this level, and 10.8% for those with no qualifications⁷.

However, the skills mismatch perspective is less frequently applied to the question of why unemployment is not evenly distributed within metropolitan areas. For example, Toothill (1961) argued that employment growth in Scotland was constrained by the poor skills profile of the workforce nationally, and this argument was more recently made by the Cabinet Office (1999) in relation to the whole of the UK. Mair and Miller (1989) used the skills mismatch perspective to explain the risk of unemployment faced by different individuals, showing that those with lower qualifications and previous work experience in lower-skilled occupations were at greater risk of being unemployed.

There are other, related, perspectives on the causes of disadvantage generally in deprived urban neighbourhoods. Most of these perspectives are loosely related to supply side views of the labour market in that they stress the characteristics of disadvantaged individuals and communities to the exclusion of structural explanations such as the changing location of jobs (Thrift, 1979). For example, some authors have stressed the role of the formation of sub-cultures (Wilson, 1987, 1997), the dislocation from information networks and weak labour market 'attachment' (Fieldhouse, 1999).

⁷ Source: Labour Force Survey

This discussion is not intended to imply that these notions are ‘wrong’, rather that they may be incomplete. For example, the characterisation of the sub-culture of a disadvantaged urban neighbourhood, or the analysis of information networks in different areas, are not intended to explain the spatial distribution of unemployment within an entire metropolitan area. Rather, they seek to explain the concentration of unemployment in a particular neighbourhood. Another limitation of these explanations in helping understand the spatial distribution of unemployment within a metropolitan area, is that they tend to focus on how disadvantage is *maintained* in a particular area rather than on explaining the root cause or causes.

There are three main shortcomings of the skills mismatch perspective, particularly when applied to unemployment in metropolitan areas. These are listed below before being discussed in turn. The skills mismatch perspective:

- 1) does not provide a direct explanation of the spatial distribution of unemployment within metropolitan areas;
- 2) neglects the demand side of the labour market; and
- 3) does not take into account spatial frictions within metropolitan labour markets.

3.2.2 Explaining the spatial distribution of unemployment within metropolitan areas

The skills mismatch perspective lacks a direct explanation of why unemployment is unevenly distributed within metropolitan areas. It accounts for the non-uniform distribution of unemployment within metropolitan areas by arguing that people with inappropriate skills, or lacking skills, become spatially concentrated due to the operation of housing markets which tend to segregate people of different socio-economic status (Cheshire, 1979). In the British context, the allocation of social housing also tends to concentrate people with similar characteristics in the same estates or neighbourhoods (Lee, 1994), and separate social renters from owners and private renters (Forrest and Murie, 1994). However, why should the unemployed become spatially concentrated in metropolitan cores in particular? Why not the rings of metropolitan areas? Or in pockets randomly distributed across space?

Conventional urban theory can, however, offer a partial explanation of why the unemployed are disproportionately found in the cores of metropolitan areas. Traditional urban economics explains urban residential structure in terms of a preference for space which the rich can afford to pay for (Hoyt, 1939). Suburban land with cheaper unit prices is occupied by more affluent groups because the income elasticity of demand for space is higher than that for time spent commuting (Alonso, 1964). In other words, as income rises, people's demand for space rises faster than their demand for leisure time. This explains why lower income groups are disproportionately found in metropolitan cores, although not why the unemployed are concentrated there. Obviously, however, people on lower pay at the lower end of the labour market are also those who are more at risk of experiencing a period of unemployment.

3.2.3 The demand side of the labour market

The skills mismatch perspective has been criticised for relying solely on the supply side of the labour market and not taking account of the decline in demand for manual and lower-skilled labour. The negative relationship between skill level and unemployment is not direct evidence of poor skills causing unemployment *per se*. Rather, at least in part, it is a reflection of the declining demand for lower-skilled labour causing these groups in the workforce to become unemployed. In concluding that low skills cause unemployment, the skills mismatch perspective assumes that there is a high degree of mobility between different occupational groups. However, there are cultural, educational, financial and social barriers to movement between different segments of the labour market (Fine, 1998).

The skills mismatch view of unemployment assumes that improvements in skill levels will allow vacancies to be filled more easily, which will restrain wage levels, and thus cause the demand for labour to rise (Ottersten et al, 1999). However, most employers do not find 'entry level' jobs difficult to fill (McQuaid et al, 2001), therefore training schemes such as the New Deal which are targeted on the unemployed, are unlikely to increase the number of jobs in the economy. Note that although some 'entry level' jobs can be difficult to fill, this is more a function of low pay and poor conditions than

people lacking the skills required to perform the tasks associated with the job (McQuaid et al, 2001).

Despite these concerns with the skills mismatch view of unemployment, employment initiatives in Britain and the US have focused on training the unemployed in order to address the problem of unemployment (Webster, 1997b; Ihlanfeldt and Sjoquist, 1998; Pugh, 1998; Peck, 1999). Training provision aimed at the unemployed is unlikely to enhance the skills of the unemployed to such an extent that they will be qualified for skilled jobs in the economy that employers do find difficult to fill due to skills shortages (Fine, 1998).

3.2.4 Spatial frictions within metropolitan areas

Not only does the skills mismatch perspective assume a high degree of occupational mobility, but also a high degree of spatial mobility within metropolitan areas (Ross, 1998). By focusing on the mismatch between the skills of the unemployed and the skills demanded by employers, it implicitly assumes that all groups of people can commute to any job within a metropolitan area (Morrison, 2001). Therefore, according to the skills mismatch perspective, the location of jobs within a metropolitan area does not influence the location of unemployment (Cheshire, 1979; Gordon, 2002).

Highlighting the problem of the assumption of frictionless space within metropolitan areas, Hanson et al (1997) point out that:

'even though we know that the vast majority of workers look for jobs at a scale well below that of the metropolitan area, there is a resilient idea within economics and geography that a metropolitan area is a viable measure of a local labour market. Geographic research must acknowledge the importance of intra-metropolitan labour markets, even in small and medium sized cities' (1997, p.286).

This means that unemployed people in the cores of metropolitan areas may face spatial barriers to employment due to the deconcentration of jobs (Hanson et al, 1997; Webster, 1997b; Peck, 1998; Pugh, 1998). In addition, people living on one side of a metropolitan area may find it difficult to find out about, secure and/or commute to a job on the other side of the metropolitan area.

There are limits to how far it is worthwhile to commute to a particular job because of the financial cost, time and hassle associated with travel. The financial cost alone of commuting a long distance to a minimum wage part time job is likely to dissuade a worker from taking that job, particularly those dependent on public transport (Sanchez, 1999). Empirical work has shown that there is a strong positive correlation between income and distance commuted (Gabriel and Rosenthal, 1996). In addition, manual workers and women have been shown to commute shorter distances than others (Madden, 1981; McLafferty and Preston, 1997).

Higher skilled workers also commute greater distances, largely because of the higher earnings they command (McLafferty and Preston, 1997). This means that there are more jobs open to higher skilled workers. Thus, skills and spatial mismatches interact and can be expected to reinforce one another. The lower someone's skill level, the more spatially restricted their catchment of potential jobs.

3.2.5 Conclusion

Unemployment is closely associated with low skill levels. Therefore, the skills mismatch perspective provides an explanation of why certain groups of people are at greater risk of experiencing unemployment than others. However, there are three limitations of skills mismatch as an explanation of the spatial distribution of unemployment within metropolitan areas.

First, the skills mismatch perspective cannot directly explain why unemployment should be concentrated in some parts of metropolitan areas rather than in others. Second, it does not consider the influence of the changing demand for labour in different locations and in different occupational and industrial groups. Third, it does not usually consider, explicitly, spatial frictions within metropolitan labour markets, despite evidence that the areas over which most people search for jobs and commute do not extend to the whole of metropolitan areas.

Given the deconcentration of employment within metropolitan areas and the overrepresentation of unemployment in the cores of metropolitan areas, these three limitations are potentially significant handicaps in the ability of skills mismatch to explain the spatial distribution of unemployment within metropolitan areas. The spatial mismatch hypothesis builds upon the skills mismatch perspective by introducing the spatial distribution, and changing spatial distribution, of jobs within metropolitan areas. The spatial mismatch hypothesis also considers the nature of spatial frictions, or barriers, to employment within metropolitan areas. It is to the spatial mismatch hypothesis that the discussion now turns.

3.3 Spatial mismatch in metropolitan areas

The spatial mismatch hypothesis introduces the possible role of employment deconcentration in explaining the spatial distribution of unemployment within metropolitan areas. It should not be seen as an alternative explanation to skills mismatch, as both can operate simultaneously.

The spatial mismatch hypothesis enhances the skills mismatch perspective in two principal ways. First, it introduces the demand side of the labour market explicitly to the consideration of unemployment, and therefore removes some uncertainty in interpreting the relationship between skills and unemployment. Indeed, once the spatial availability of jobs has been controlled for, the spatial cross-sectional relationship between skill level and unemployment rate may be weakened.

Second, by drawing attention to the deconcentration of jobs within metropolitan areas, the spatial mismatch hypothesis provides an additional explanation of why rates of unemployment are higher in metropolitan cores in particular, rather than elsewhere within metropolitan areas. Even if the spatial mismatch effect on unemployment is only small, it may be enough to make parts of metropolitan cores less residentially desirable and thus allow the housing market to concentrate together people with characteristics unfavourable in the labour market, consistent with the skills mismatch perspective. In addition, more sophisticated models of spatial mismatch which accurately measure the proximity of jobs to different neighbourhoods within a metropolitan area also address

the third weakness of the skills mismatch perspective, that spatial frictions are not considered.

A simple model of spatial variation in small area unemployment rates across a metropolitan area incorporating the skills and spatial mismatch perspectives is shown in equation one:

$$U_i = f(A_i, S_i) \quad (1)$$

Where:

U_i = unemployment rate in area i ($i = 1, 2, 3, \dots, n$)

A_i = accessibility to jobs from area i

S_i = vector of the skills and characteristics of the residents of area i

However, the spatial mismatch hypothesis also makes assumptions about the operation of metropolitan housing and labour markets. These are discussed in the critique of the hypothesis which follows. First, however, the development of the hypothesis in the US is outlined in more detail and its application to the British context is discussed.

3.3.1 Outline of the spatial mismatch hypothesis

The spatial mismatch hypothesis states that concentrations of unemployment in US central city areas exist, in part, because of the deconcentration of employment in the face of residential segregation which prevents the migration of central city residents to areas of greater labour demand in the suburbs (Kain, 1968). As Kain (1968) showed, this would disproportionately impact upon ethnic minority groups whose residences are disproportionately found in US central cities. The spatial mismatch hypothesis was a challenge to the prevailing notion in the US during the 1960s that employers' racial discrimination accounted for high unemployment among African Americans. The spatial mismatch hypothesis introduced a structural force (namely the local demand for labour) into the debate surrounding the causes of racial inequality.

The spatial mismatch hypothesis argues that because the deconcentration of the lower-skilled service sector and manufacturing employment have been the most marked, the impact has been the greatest on the lower-skilled and blue-collar residents of the central city (Kasarda, 1990). Although originally applied to the question of high unemployment among ethnic minority groups in the US in the 1960s, more recent work has shown that white people in manual occupations resident in US central cities face similar spatial barriers to employment (Ihlanfeldt and Sjoquist, 1989; Cooke and Shumway, 1991).

The general consensus emerging from the debates and discussions which have taken place in the US spatial mismatch hypothesis literature is that there are three main spatial barriers faced by residents of metropolitan cores in securing work located in metropolitan rings: commuting, migration and information (Ihlanfeldt and Sjoquist, 1998). However, the precise nature and magnitude of these spatial barriers has not been the subject of much empirical research. These three factors are now considered in turn.

Commuting to decentralised jobs is not a viable option for many residents of metropolitan cores. The financial cost of commuting, whether in public transport fares or private vehicle fuel, is high in relation to the wage on offer, meaning net earnings after commuting costs can be low (Holzer et al, 1994). In addition to the financial cost, the time spent travelling can be considerable, particularly by public transport. Furthermore, reverse commuting (i.e. core to ring) is often poorly served by public transport (Johnston-Anumonwo, 1995). Compounding the problems of public transport accessibility is the fact that central city residents have lower car ownership rates than suburban residents (Shen, 1998).

In the US context, migration from central city to suburb is restricted by racial discrimination in the suburban housing market (Ross, 1998). Although so-called 'red-lining', whereby real-estate vendors prevent members of ethnic minority groups from purchasing property in predominantly white suburban neighbourhoods, has been outlawed in the US, this is difficult to enforce and is thought still to be practised (Ihlanfeldt and Sjoquist, 1989). In the US context, racial discrimination in suburban

housing markets is thus thought to be an important component of the residential mobility barrier to employment. However, the availability of low cost housing in suburban areas is also restricted (Kasarda, 1990), often deliberately by planning measures (Downs, 1999), and this affects central city residents of all races who might wish to move to the suburbs (Ihlanfeldt and Sjoquist, 1990).

There is also evidence of racial discrimination in US labour markets in addition to suburban housing markets (Ellwood, 1983; Turner, 1997). Racial discrimination by employers has a spatial outcome in terms of labour market indicators such as unemployment, because racial groups are not evenly distributed across space. However, racial discrimination in labour markets does not actually constitute a spatial barrier to employment in itself.

Job search and recruitment may also present spatial barriers to employment. The further a job vacancy is from home, the less likely an individual is to find out about it (Russo et al, 1996). A number of reasons have been suggested for this. First, search costs increase with distance from home in terms of the time and cost of travel (Crampton, 1997; Morrison, 2001). Second, 'word-of-mouth' is an important source of labour market information for lower-skilled and blue-collar jobs (Wilson, 1987; Duffy, 1992). Friends, family and neighbours who are in employment may inform people about vacancies at their workplace. In more general terms, neighbourhood social networks may communicate information about pay, conditions and the culture of local workplaces, so some local firms obtain a reputation as a 'good place to work' (Immergluck, 1998a). A third, related, factor is the value which some employers place on recruiting individuals referred from current employees. This method of recruitment has a good success rate in recruiting a person who has the required attitude and personality to 'fit' with the firm (Fernandez and Weinberg, 1996). Finally, from the employers' perspective, lower-skilled vacancies are often advertised locally, for example on the factory gate, in local shop windows or through a local employment exchange (O'Regan and Quigley, 1998). Furthermore, employers may prefer locals because they are less likely to leave for a job elsewhere and are more likely to be punctual and able to work overtime at short notice (Russo et al, 1996). In addition, if

faced with commuting constraints, a job seeker may turn down job offers which are more distant (Crampton, 1997).

Results of work which tests the spatial mismatch hypothesis in the US remain mixed. Some studies claim considerable support for the hypothesis (for example, see Hughes, 1989; Ihlanfeldt and Sjoquist, 1989, 1990; Kasarda, 1990; McLafferty and Preston, 1996; Thompson, 1997; Raphael, 1998) while others claim that the location of jobs has no influence on the employment outcomes of central city residents (for example, see Ellwood, 1983; Gordon et al, 1989; Zhang, 1998). Opinion in both 'camps' can be strong, as demonstrated by Ellwood's over quoted "It's not space, it's race" (1983, p.57). This quotation highlights some of the anti-racial discrimination rhetoric and ideology which some opponents of the spatial mismatch hypothesis bring to the debate.

3.3.2 The spatial mismatch hypothesis in British metropolitan areas

This section considers the validity of applying to British metropolitan areas the spatial mismatch hypothesis, which was developed in the US. Differences between US and British metropolitan areas are set out before the relevance of the spatial mismatch hypothesis in relation to the three spatial barriers outlined in the previous section are considered; namely commuting, migration and job search/recruitment.

There has been a marked deconcentration of employment opportunities within British metropolitan areas, as there has been within US metropolitan areas. This was demonstrated empirically for the eight British metropolitan areas in chapter two. Thus, there is the potential for there to be a spatial mismatch between the location of new job opportunities and the location of the unemployed.

Two related strands of British literature provide useful context to the spatial mismatch hypothesis. The first strand of literature to lend indirect support to the spatial mismatch hypothesis in Britain (and elsewhere) is that which examines the distances travelled to work by different groups of workers. This literature has shown that some groups live closer to work than others, notably those on lower pay, those in manual occupations, those who travel by public transport and women (Madden, 1981).

The second looks at the reasons for different groups of people being more, or less, likely than others to migrate for employment related reasons. For example, it has been shown that those in social rented accommodation (Hughes and McCormick, 1981) and those in manual and less skilled occupations (Minford et al, 1987; Doogan, 1996) have lower residential mobility than other groups, although such studies usually focus on inter-regional migration rather than on migration within a metropolitan area. It has been argued that the former finding can be explained by administrative obstacles to residential mobility within the social rented sector in Britain. Thus, housing tenure in the British context forms a direct parallel with racial segregation in the US in accounting for residential immobility (although this is not intended to imply that ethnic minority groups are not spatially segregated within British metropolitan areas).

Manual and lower-skilled groups are thought to be less likely to migrate than other groups because of less suitable employment vacancies in all locations (Gordon and Vickerman, 1982; Gordon, 1985; 1990), information about these jobs being more spatially constrained (Doogan, 1996) and because members of these groups may have an intrinsic inflexibility or low propensity for change (Gordon, 1999). Older age groups have also been shown to have lower residential and occupational mobility rates than younger age groups (Millington, 1995).

While not wishing to denigrate the importance of race in determining the socio-economic status of ethnic minority groups in Britain, the benefit of applying the spatial mismatch hypothesis to Britain is to reshape the approach of academics and policy makers to the causes of, and solutions to, urban poverty and unemployment more generally. This is not to understate the severity of racial inequality in Britain, but to stress that urban poverty and unemployment are by no means exclusively racial issues. Some US authors (Ihlanfeldt and Sjoquist, 1989; Cooke and Shumway, 1991) have argued that the issue of race in US spatial mismatch studies has detracted from the broader structural forces affecting all low wage labour in metropolitan areas, for example:

“the confusion over the role of race and space stems from an over-emphasis on race in the spatial mismatch hypothesis”
(Cooke and Shumway, 1991, p.311).

And

“the key point in the formation of spatial mismatch is that low-wage labour is spatially immobile”
(Cooke and Shumway, 1991, p.311).

However, initial spatial mismatch hypothesis studies in Britain have focused on the issue of racial differences in employment status and distances commuted. For example, Owen and Green (1999) find that Black and South Asian groups work closer to home than white people, although this is mediated by age and gender, with the ethnic difference in commuting being less for younger women in particular.

Thomas (1998) finds that ethnic minority groups in Britain are at greater risk of spatial mismatch unemployment because they work closer to home than the population as a whole, and that differences in commuting accounts for around 20% of the difference between ethnic groups' unemployment duration. In contrast, Fieldhouse (1999) finds little support for the hypothesis, showing that small area unemployment rates in London are considerably more strongly correlated with housing, skills and demographic factors than with residential location. However, Fieldhouse does not explicitly incorporate the location and changing location of jobs, but rather limits his spatial analysis to a consideration of individuals' residential location.

3.3.2.1 Contrasts between US and British metropolitan areas

A few broad differences between US and British metropolitan areas should be borne in mind in applying the spatial mismatch hypothesis to British metropolitan areas. First, metropolitan deconcentration is not as far advanced in Britain as in the US (Summers, 1999). Second, British metropolitan areas are generally of higher density than US metropolitan areas, meaning heterogeneous socio-economic groups live in closer proximity to each other, although not to the same degree as in many continental European metropolitan areas (Downs, 1999). Third, metropolitan areas in Britain and the rest of Europe have more extensive public transport systems than in the US, and

lower car ownership rates (Downs, 1999). Fourth, British metropolitan areas are generally smaller than those in the US, on which spatial mismatch studies have focused. These factors would suggest that spatial mismatch may be slightly less significant in Britain than in the US. The implications of the characteristics of a particular metropolitan area for the issue of spatial mismatch are discussed in more detail in chapter nine.

However, British industrial estates, in which much employment in the rings of metropolitan areas is located, are difficult to serve by public transport because they tend to be in less accessible suburban locations, and, comprising only commercial land use, do not generate much demand for travel during the day to sustain the viability of public transport services. Some larger firms in suburban industrial estates, however, provide 'works buses' from the city centre or elsewhere.

3.3.2.2 Contrasts in specific spatial barriers

The relevance of the three spatial barriers outlined previously to British metropolitan areas is now considered. The three barriers are commuting, migration and information.

Reliance on private transport in Britain is lower than in the US (Downs, 1999). However, this difference may be less pronounced when comparing the unemployed or low income groups in the two countries. In both countries, there is a much greater reliance on public transport by the unemployed, and by low income and lower-skilled workers (Cooke and Shumway, 1991; Duffy, 1992). There is some evidence from survey responses from unemployed people that in Britain travel cost (Hasluck, 1987) and travel time (Duffy, 1992) are barriers to employment, especially to low-paid work (McGregor and McConnachie, 1995).

Residential mobility is generally greater in the US than in Britain (Clarke, 1998), although it is less clear to what extent this applies to different ethnic and socio-economic groups, and at different geographical scales. Mobility rates in Britain, particularly between local authority areas, are influenced by housing tenure (Hughes and McCormick, 1981). The process of securing accommodation in the social rented sector

can be bureaucratic, time consuming and intimidating (Minford et al, 1987). People on a waiting list, for example people leaving their parental home or moving out of the private rented sector, can be required to wait years before being allocated accommodation (Lee, 1994). Furthermore, transferring to another Housing Authority area puts people to the bottom of the queue (Hughes and McCormick, 1981) thus making migration between local authority areas difficult. Transfers within the same Housing Authority or other type of social landlord can also take considerable time (Minford et al, 1987).

Many inner city areas and peripheral housing estates in British cities are dominated by the social rented sector, although the inner cities also have considerable amounts of privately rented housing (MacLennan, 1999). Therefore, the restricted residential mobility of social rented sector tenants in Britain forms a direct parallel with the restricted mobility of African Americans in the US due to discrimination in suburban housing markets. However, restrictions also apply to other housing tenures in Britain. The private rented sector may be a suitable stop gap or permanent arrangement (Webster, 1994) but tends not to be prevalent in the suburban locations of manual and lower-skilled jobs growth (Gordon and Vickerman, 1982). Those currently in owner occupation but on low income seeking alternative employment may find search and relocation costs prohibitive (Green, 1994b). In all the above situations, a lack of savings is an additional financial barrier to migration (Gordon and Vickerman, 1982; Kitching, 1990), and the risk involved and psychological costs of leaving a familiar environment and losing social contacts also act as deterrents (Molho, 1995).

Similar arguments about job search and recruitment across space in US metropolitan areas also apply in Britain. One additional relevant consideration, however, is the role of Job Centres in Britain. These are employment exchanges run by the government's Employment Service that those eligible for Job Seekers' Allowance (JSA) must periodically attend in order to supply evidence that they are searching for work in order to continue to receive JSA. Although each individual Job Centre has access to a national database of job vacancies, generally only local jobs and those in the city centre are placed on visual display. In addition, only between one-quarter and one-third of all

job vacancies are notified to Job Centres (Newman and Denman, 1995). The Job Centre network may thus increase the total supply of information but may also actually restrict it to localised areas (Bohlm and Taylor, 2001).

It is sometimes thought that employers in Britain discriminate against applicants with an address in certain neighbourhoods which have poor reputations (for example, see McGregor, 1977; Social Exclusion Unit, 1998). However, direct evidence of 'postcode discrimination' is difficult to find. While this practice, if it exists to a significant extent, will disadvantage job seekers from certain neighbourhoods, there is no reason why the location of those neighbourhoods would be related to the location of employers. The spatial mismatch hypothesis is concerned with the extent to which physical separation between job seekers and job vacancies can be overcome. The criteria used by employers in recruiting staff are not of relevance to the spatial mismatch hypothesis, unless those criteria introduce a preference for job applicants who live locally. 'Postcode discrimination' is not an example of such a criterion, since stigmatised estates could be located close to employers, or equally could be located some distance away.

Some authors argue that 'area effects' can become established, particularly if unemployment and socio-economic disadvantage is geographically concentrated, and that these effects can help explain individuals' risk of unemployment (Jargowsky, 1997). Area effects can be broad ranging, including factors such as dislocation from information networks, lowered employment aspirations, and general stigmatisation, including postcode discrimination by employers. However, testing for 'area effects' is not the same as testing explicitly for unemployment being caused by a lack of locally available jobs as is the case with the spatial mismatch hypothesis. 'Area effects' do not require there to be any spatial variation in the availability of jobs within a metropolitan area, although the availability of jobs is sometimes included, but as another 'area effect' (for example, see Fieldhouse and Tranmer, 2001). To separate 'individual' and 'area' effects is not the same as the spatial mismatch hypothesis which seeks to separate supply-side and demand-side effects in the labour market. The individual/area debate is on a different axis to the supply/demand debate, as the former does not require there to be any spatial variation in the availability of jobs.

3.3.3 Critique of the spatial mismatch hypothesis

The spatial mismatch hypothesis has been criticised by Arnott (1998) for being incomplete and lacking a theoretical basis. Arnott argues that:

“Lurking behind the hypothesis is some conception of how urban housing and labour markets work, and how their operation is affected by housing discrimination and job suburbanisation”
(Arnott, 1998, p.1172).

For example, the spatial mismatch hypothesis literature has not systematically addressed the reasons for employment deconcentration (Fernandez, 1994), the reasons for the residential immobility of central city residents (Martin, 1997), nor possible outcomes of employment decline other than unemployment, such as lowered wages and lowered housing costs (Zax, 1991; Fernandez, 1994).

The spatial mismatch hypothesis makes seven assumptions. These theoretical assumptions have led to methodological weaknesses in some of the work which has been carried out to test the spatial mismatch hypothesis. The seven assumptions are:

- 1) that the deconcentration of employment is greater than the deconcentration of population;
- 2) that the unemployment rates found in the cores of metropolitan areas are greater than those in the rings;
- 3) that employment deconcentration is not related to the quality of the central city workforce (Fernandez, 1994);
- 4) that residential location influences employment prospects, but not vice-versa (Ihlanfeldt and Sjoquist, 1990);
- 5) that the daily transport mobility of core and ring residents is the same (Shen, 1998);
- 6) that unemployment is the main outcome of low accessibility to jobs (Zax, 1991);
and
- 7) that commuting constraints and residential immobility are the principal spatial barriers to employment (Immergluck, 1998a).

The first two of these assumptions, if false, would compromise the validity of the spatial mismatch hypothesis. The other five assumptions, if false, would expose incompleteness in the spatial mismatch hypothesis rather than necessarily invalidating it. The following section shows that in Britain assumption number 1) is true, and the previous chapter showed that number 2) is true in most of the metropolitan areas of the US and Britain.

Nevertheless, if *both* 1) and 2) are *not* true in a particular metropolitan area, then this is not inconsistent with the spatial mismatch view of unemployment, although it *is* inconsistent with the core/ring metropolitan spatial context to which the spatial mismatch hypothesis in particular is applied. The scenario of both 1) and 2) being false may indicate that space is indeed a barrier to people accessing employment within a metropolitan area, but that a rise in the availability of jobs per worker in the core relative to the ring has caused the unemployment rate in the core to be lower than that in the ring. Thus, the spatial mismatch hypothesis could be more generally stated as a postulated spatial relationship between the decline in the availability of jobs and unemployment rates at the sub-metropolitan scale (i.e. without actually stating a particular pattern such as higher unemployment rates in the core than the ring).

The other five assumptions do not necessarily call the spatial mismatch hypothesis into question, but rather expose gaps, mainly of extent rather than direction, which emerge when the hypothesis is examined more closely. 'Add-ons' and caveats can deal with these latter five assumptions from a theoretical point of view, but the assumptions have given rise to some methodological weaknesses in some of the work carried out to test the spatial mismatch hypothesis to date.

Each of these seven assumptions is now explained in more detail. The following section of this chapter then constructs a conceptual framework in which to locate the spatial mismatch hypothesis and in which to develop a robust methodology to test it.

3.3.3.1 Assumption one - that the deconcentration of employment is greater than the deconcentration of population

This is a prerequisite for the spatial mismatch hypothesis to apply. However, it is often assumed as a 'given', and is not explicitly examined by methods used to test the spatial mismatch hypothesis. If population deconcentration is greater than that of employment, then those remaining in the core would have *more* jobs available *per worker* than previously. However, Turok and Edge (1999) show that in Britain, employment deconcentration has indeed been greater than that of population, consistent with the spatial mismatch hypothesis.

Turok and Edge (1999) provide labour market accounts of net changes in Britain's metropolitan cores throughout the 1980s to illustrate how people respond to job loss. This is shown in table 3.1.

Table 3.1 Labour market accounts for Britain's metropolitan cores[#], 1981-91

		Male		Female	
		Number	%*	Number	%*
	Job Loss	384,000	20.0	46,000	3.4
PLUS	Natural increase in workforce	23,000	1.2	6,000	0.4
MINUS	Net out-migration	197,000	10.3	70,000	5.2
MINUS	Change in net out-commuting	95,000	5.0	-64,000	-4.8
MINUS	Rise in economic inactivity	117,000	6.1	14,000	1.0
MINUS	Rise in number on gov. schemes	31,000	1.6	20,000	1.5
EQUALS	Change in unemployment	-33,000	-1.7	12,000	0.9

[#]These are the eight metropolitan cores outlined in chapter two.

*% of economically active in 1981.

Source: Turok and Edge (1999) using Census of Population and Census Special Workplace Statistics.

As can be seen, out-migration is the largest response to job loss for males, representing just over 51% of the male job loss. Some of this, however, represents the suburbanising residential choices of people who remain employed in the metropolitan cores, but in *net* terms this is captured by the change in the net out-commuting figure. Despite this, net out-commuting from metropolitan cores by men *increased* between 1981 and 1991.

This shows that the increase in gross out-commuting due to employment deconcentration was greater than the increase in in-commuting due to the suburbanisation of population for reasons of residential preference. After migration, the

second most significant response is the rise in economic inactivity, for males representing just under one-third of the male job loss.

Bear in mind that the fall in the number of unemployed men resident in the metropolitan cores between 1981 and 1991 does not imply a fall in the unemployment *rate*, since the population of the metropolitan cores also fell during this period. In addition, it has been argued that the dramatic rise in the number of men on sickness related benefits in Britain comprises a large proportion of the 'hidden unemployed' due to social security benefit rules (Beatty and Fothergill, 1999). Thus, although there has been a reduction in the number of unemployed males resident in Britain's metropolitan cores between 1981 and 1991, the number of men not in work rose substantially.

The female labour market accounts show a different picture. The employment base of jobs held by women in the metropolitan cores has contracted much less than that of jobs held by men. The net-out-migration figure for females actually exceeds the loss of jobs held by women, most probably a result not of search for work elsewhere but wholly moving households moving in search of male work and the suburbanisation of households for reasons of residential preference. This interpretation is reinforced by the significant increase in net *in*-commuting to the metropolitan cores by women between 1981 and 1991.

Employment decline in the cores of the eight British metropolitan cores has been greater than the decline in population. However, if the converse had been true, and the decline in the size of the working age population had matched the decline of employment, then the relative availability of jobs to residents remaining in the core would have remained unchanged because the competition for job vacancies would have declined by the same amount as employment opportunities. Therefore, when designing a measure of geographical accessibility to employment, the amount of competition for jobs needs to be taken into account. Not all spatial mismatch studies do this. For example, Hanson et al (1997) measure accessibility simply as the number of jobs within a given radius of an individual without taking account of different levels of competition. The radii used for different labour market segments are the mean commute times of workers in each

segment, for example 2.86 miles in the case of part-time suburban women. Despite this limitation, the study finds support for an adverse effect on female unemployment caused by poor job accessibility, but for part time female dominated occupations only (although no male unemployment was included in the analysis).

A measure of the accessibility to employment from different neighbourhoods within a metropolitan area needs to take account of the spatial distribution of competing workers. A good specification of this is provided by Shen (1998), as shown in equation two:

$$A_i = \frac{\sum J_j f(T_{ij})}{C_j}, \quad C_j = \sum W_k f(T_{jk}) \quad (2)$$

Where:

A_i = Accessibility to employment from i ($i = 1, 2, 3, \dots, n$)

J_j = Jobs in each other area surrounding area i ($j = i-1, \dots, n-1$)

T_{ij} = Travel time from area i to each other surrounding area

C_j = Competition for jobs in area j

W_k = Workforce in each other area surrounding area j ($k = j-1, \dots, n-1$)

Equation two reflects the spatial distribution of competing workers as well as the spatial distribution of jobs. Given that the commuting flow from j empirically displays negative exponential decay with respect to distance from j , the competition to a resident of i from workers who live close to a job in j is greater than the competition from workers who live further from j . Therefore, if workers are not evenly distributed across space, then neither is the level of competition for jobs. Thus, it is vital to incorporate competition into access measures in order to accurately assess the spatial mismatch hypothesis.

3.3.3.2 Assumption two - that the unemployment rates found in the cores of metropolitan areas are greater than those in the rings

This may seem an obvious point, but the spatial concentration of unemployment in the cores of metropolitan areas is sometimes taken as a 'given', as with the changing availability of jobs explained above. Many studies of the spatial mismatch hypothesis in the US simply compare differences in commuting behaviour of residents of metropolitan cores with that of residents of metropolitan rings, without relating this to spatial differences in unemployment rates. The previous chapter showed that the cores of the largest metropolitan areas in the US and in Britain do indeed have higher unemployment rates than their rings. The next chapter explains in greater detail the methodological implications of this assumption.

However, as with the previous assumption, this assumption need not be a problem if the spatial mismatch hypothesis explicitly considered the changing spatial distribution of employment in relation to the changing spatial distribution of population. There could be a spatial mismatch between the location of the unemployed and the location of suitable job opportunities in any urban (or rural) land use structure. 'Spatial mismatch' unemployment could, in theory, occur in any location, and is in no way dependent on a particular land use structure. It is, however, dependent on a lowering through time of the availability of jobs per worker in a particular local area in the face of spatial barriers to employment.

The two assumptions of the spatial mismatch hypothesis outlined so far stem from the fact that the hypothesis is a narrow and highly specific empirically-derived statement of cause and effect in the context of contemporary change in metropolitan areas. As Arnott (1998) argues, it lacks a theoretical basis which allows it to be immediately transferred to the operation of local labour markets in other contexts and empirical situations, for example, if employment was concentrating in urban areas rather than deconcentrating. In these respects, it is important to develop a broader conceptual framework in which to locate the spatial mismatch hypothesis.

3.3.3.3 Assumption three - that employment deconcentration is not related to the quality of the workforce resident in metropolitan cores

If part of the reason for employment deconcentration is the low quality of the workforce resident in metropolitan cores, then it would be a skills mismatch which would be in part responsible for creating a spatial mismatch between the unemployed and employers. It is therefore important to consider the reasons for employment deconcentration. In relation to a firm that relocated from the CBD to the suburbs of Milwaukee, Illinois, Fernandez (1994) found that the quality of the central city workforce played no part in the firm's decision to relocate.

However, employment deconcentration is driven mainly by differential in situ growth/contraction between ring and core, rather than by the relocation of individual firms (although the latter is not insignificant). This, however, does not diminish the potential role for the quality of the workforce resident in metropolitan cores to contribute towards employment deconcentration. A low quality workforce resident in the core could restrain jobs growth there, while a high quality workforce in the ring could enhance growth in the outer parts of metropolitan areas. The mechanisms behind this may be that firms in metropolitan cores have: higher rates of industrial stoppage; less reliable or less competent workers; and that the cores of metropolitan areas may have lower firm formation rates than the rings.

Fothergill and Gudgin (1982) put forward four explanations of the poor employment performance of cities compared to the rest of Britain. First, they put forward the industrial mix argument, i.e. that cities have a larger share of industries that are in decline nationally, but acknowledge that since the mid 1960s this has "become more or less irrelevant as an explanation of disparities in growth" (p.8). Second, they note that the main factor driving spatial differentials in employment change is the failure of firms in cities to expand. This Fothergill and Gudgin put down to cramped sites and the impracticability of expanding floor-space. Third, the authors cite the size structure of firms in cities. People who create firms tend to have worked previously for a small firm. Since cities are dominated by larger firms, they have low firm formation rates. The final factor which Fothergill and Gudgin use to explain differential spatial

employment change is regional and other spatial policies such as the New Towns programme. These policies promoted the movement of people and jobs out of larger cities. Fothergill and Gudgin examined industrial stoppage rates and other labour productivity indicators for large cities but found no significant difference with the rest of the country. In other words, the quality of the workforce resident in metropolitan cores is not a significant factor behind employment deconcentration within metropolitan areas in Britain.

Keeble (1980) tests five possible explanations of differential spatial employment change in Britain. This is done after performing shift-share analysis to remove the industrial mix factor, which is shown to be significant. Thus, regression was performed using the spatial differential in employment change 1971-76 as the dependent variable, after taking industrial mix into account. The four remaining explanations are coded as independent variables in the regression equation. They are: 1971 manufacturing employment density to reflect level of urbanisation; real value of government regional policy incentives per £100 of investment over the five year period lagged by 18 months; an index of residential preference; and finally 1971 female activity rates to test whether firms were seeking non-unionised female labour availability. The results show that the single most important explanation of differential spatial employment change was the 1971 manufacturing density. This is consistent with Fothergill and Gudgin's (1982) 'cramped sites' argument. Residential preference and regional policy were shown not to have statistically significant relationships with the dependent variable, although the author acknowledges that during the period of severe economic downturn to which their data related, there may have been a lack of mobile capital for regional policy to influence. Although female activity rate was significant on its own, it was negatively collinear with manufacturing density thus questioning whether its association with differential spatial employment change actually represents a causal relationship.

Thus, there is only very limited evidence that employment deconcentration is caused by the quality of the workforce resident in metropolitan cores. Other factors, principally industrial mix, urban size and urban density, appear to be more important in explaining employment deconcentration. Therefore, the assumption of the spatial mismatch

hypothesis that employment deconcentration can be considered as a factor exogenous to the supply characteristics of the workforce resident in metropolitan cores appears to be valid in the British context, certainly during the 1970s when metropolitan employment deconcentration was occurring at its greatest rate and British industrial relations were at their worst since the War.

3.3.3.4 Assumption four - that residential location influences employment prospects, but not vice-versa

The spatial mismatch hypothesis assumes that because of the deconcentration of employment, *ceteris paribus*, residents of metropolitan cores are less likely to be employed than their counterparts in metropolitan rings. However, it may be the case that once an individual enters employment, they are then more likely to make a residential move to the suburbs (Ihlanfeldt and Sjoquist, 1990). In addition, this migration may be selective of those with higher skills.

If part of the reason for moving out of the core of a metropolitan area is to reduce a commute to a decentralised job, then the deconcentration of employment would be partly causing the poor skills profile of the core. This would challenge the skills mismatch perspective because it would be, in-part, the local availability of jobs creating the poor skills profile found in areas of high unemployment.

The suburbanisation of population, even if it is not to *any* extent caused by people shortening their commutes in response to the deconcentration of employment, presents a problem, methodologically at least, for the spatial mismatch hypothesis. If, when people can afford to do so, they tend to move to suburban areas because these areas offer a more attractive mix of housing, neighbourhood characteristics, environment and local services, then being employed is the causal mechanism behind residential location, as opposed to vice-versa, as the spatial mismatch hypothesis requires. This is not to imply, however, that causation cannot, and does not, operate in both directions (Andrew and Meen, 1999).

Congdon and Champion (1989) show that out-migration from inner London boroughs is indeed partially employment driven. Furthermore, it is shown to be selective of those with greater skills. Thus, the deconcentration of employment within metropolitan areas is indeed partially creating the poor skills profile of metropolitan cores. This will result in a spuriously exaggerated relationship between skills and unemployment in studies that look for a simple relationship between skills and unemployment using cross-sectional spatial data, since the deconcentration of jobs is contributing to the depletion of the skills profile of high-unemployment inner London boroughs.

Because most suburban areas are net exporters of commuters to city centres (i.e. have an excess of workers over local jobs), a geographical study using cross-sectional data which examines the relationship between proximity to jobs and neighbourhood unemployment rates may find that low unemployment suburban neighbourhoods actually also have low proximity to jobs (Coombes and Raybould, 2001). This is the result of the endogeneity of suburban residential location to employment status explained above.

Two points need to be made in relation to this effect. First, that it may only apply to the upper parts of the labour market. In other words, people in the lower parts of the labour market, who bear the brunt of unemployment, may not earn enough to move to the suburbs, at least not to areas of the lowest density which tend to be the greatest net-exporters of commuters. Therefore, it is important that spatial mismatch studies which employ a cross-sectional approach segment the labour market, i.e. restrict the analysis to lower parts of the labour market. This is related to the issue which was discussed in the skills mismatch section previously as to what degree of labour market segmentation should be assumed when assessing the relative importance of skills and spatial mismatches in causing higher unemployment rates in the cores of metropolitan areas than in the rings.

The second point that needs to be made in relation to this effect is that, to an extent, it can be controlled for by measuring neighbourhoods' accessibility to employment *growth* rather than simply to employment availability at a point in time. This is

consistent with the spatial mismatch hypothesis, which emphasises the role of employment *deconcentration*, i.e. change through time. Because, in the *long term*, a large proportion of people adjust to changes in the location of jobs, the *change* in the local availability of employment opportunities may be more important in explaining local unemployment rates than the absolute availability of employment opportunities at a point in time. Some authors have measured employment availability as the change in the number of jobs over a given time period. For example, Rogers (1997) uses the measure of job accessibility for Pittsburgh shown in equation three:

$$A_i = \sum_{t_{ij}} \frac{1}{T_{ij}} (J_i(t) - J_i(t-1)) \quad (3)$$

Where:

A_i = Accessibility to jobs from area i ($i=1, 2, 3, \dots, n$)

T_{ij} = Travel time from each other area j ($j=i-1, \dots, n-1$)

J_i = Jobs in area i

t = Time period

Rogers calibrates a model which predicts the probability of a male leaving unemployment in a given week. She uses the following additional independent variables: age, education, race, household size, marital status, earnings or previous earnings, duration of unemployment insurance entitlement and dummies for industrial sector (manufacturing, construction and retail). The most significant variable is duration of unemployment insurance entitlement followed by the magnitude of change in local employment. However, note that in Rogers' measure of job accessibility, the level of competition from other workers is not taken into account. As population density is greater in the central city than the suburbs, this has the effect of over stating the availability of jobs to central city residents, thus introducing a bias against finding evidence in support of the spatial mismatch hypothesis, yet the employment access variable remains the second most significant in the model. However, this bias is countered by the suburbanisation of workers creating the problem of the endogeneity of residential location with respect to employment status.

However, this concentric residential urban land use pattern with a high density core of low income housing surrounded by lower density, higher income suburban housing has been breaking down for some time (MacLennan, 1999). This is principally because of two reasons: cities have become more polycentric (Champion, 2001) and people's travel mobility has much increased over recent decades (Kivell, 1993). Thus, the problem of the endogeneity of residential location with respect to employment status in terms of the spatial mismatch hypothesis may be diminishing.

Employment has deconcentrated and smaller towns around large cities have grown, forming polycentric urban regions. Transport costs continue to fall in real terms (Hall, 1997a) and because of real earnings growth, *a priori*, even more so as a proportion of earnings. Rising car ownership, particularly of households' second vehicles, has broken the tie between residential location and access to frequent public transport services for many people. Within reasonable time and cost constraints, car owners are fairly footloose in terms of residential location. Increasing numbers of two earner households also opens up 'corridors' between the two workplaces which households consider in searching for a house (White, 1977) and make semi-rural locations close to motorway junctions attractive residential locations (Green, 1997). These changes have caused some to think of urban areas' land use patterns as mosaic (MacLennan, 1999).

Although traditional urban models are probably no longer as powerful in explaining urban land use patterns at a point in time, they retain some resonance in explaining locational decision making. Households still make trade-offs between housing and travel costs in their residential locational choices, although those choices no longer result in such a striking systematic land use pattern on the ground, for the reasons outlined above.

Some studies have assessed the extent to which people are actually 'compensated' for longer commutes with higher wages and/or lower unit housing costs. There is some evidence that those with longer commutes, *ceteris paribus*, are partly 'compensated' with higher wages in Britain (Kasper, 1983) and in the US (Zax, 1991a; Ong and

Blumenberg, 1998). This suggests that employers in parts of cities with lower proximate labour availability have to pay more to attract workers. US studies have shown that those with longer commutes have, *ceteris paribus*, lower unit housing costs (Gabriel and Rosenthal, 1996) and a combination of higher wages and lower unit housing costs (Zax, 1991a). This suggests that residential areas with low accessibility to jobs have lower housing demand, thus driving down property and rental values.

3.3.3.5 Assumption five – that the daily transport mobility of core and ring residents is the same

This assumption relates to the way in which the spatial mismatch hypothesis treats space within metropolitan areas. In analysing the association between neighbourhoods' unemployment rates and their geometric proximity to jobs in terms of distance, it is implied that a typical resident of a metropolitan core can commute equally far as a typical resident of the metropolitan ring. This is not true on three counts. First, as average residence-based earnings are lower in the cores of metropolitan areas than in the rings, it is to be expected that residents of the core will commute less far. This has been shown to be the case by work examining commute propensity in the US (for example, see Ihlanfeldt and Sjoquist, 1990; McLafferty and Preston, 1996). Second, residents of metropolitan cores are less likely to have access to private transport than residents further out (Shen, 1998). Private transport achieves higher average speeds than most public transport services (Holzer et al, 1997) and delivers more reliable journey times (Bruzeliuss, 1979), therefore those commuting by car can travel further in a given amount of time. Third, core residents may experience traffic congestion on a greater proportion of their journey to work, thus further decreasing average speed.

At first glance, the above factors may appear to merely introduce random noise to models which seek to explain the relationship between neighbourhood unemployment rates and local proximity to jobs. However, on closer consideration, all three actually introduce bias *against* finding evidence of the spatial mismatch hypothesis (Houston, 1998). All three result in the accessibility of jobs to inner city neighbourhoods being overstated because inner city neighbourhoods tend to be low income, have low car ownership and experience traffic congestion. This artificially weakens the relationship

found between neighbourhood unemployment rate and the local proximity to jobs. This effect could potentially be large. Consider the following hypothetical example: average earnings in the inner city are 65% of suburban earnings, car ownership is 75% of that in suburbia and extra congestion adds 10% to the typical journey from the inner city. Assuming that distance commuted is inelastic both with respect to earnings (as suggested by Alonso, 1964) and with respect to car ownership (as suggested by Loewenstein, 1965) with elasticities of 0.7 and 0.6 respectively, this will alter the distance that inner city residents commute by a factor of $(1 - ((1 - 0.65) * 0.7)) * (1 - ((1 - 0.75) * 0.6)) * 0.90 = 0.58$. In other words, inner city residents will, on average, commute only 58 per cent of the distance of their suburban counterparts. Given that the area of a circle is governed by the square of its radius, this reduces the number of jobs open to inner city residents to only 37 per cent of those open to suburban residents. This hypothetical example illustrates the importance of controlling for different mobility levels in calibrating accessibility models to explain the importance of the proximity of jobs to neighbourhoods in explaining their unemployment rates.

The importance of mode of travel cannot be over emphasised. To illustrate this, consider the findings of Shen (1998), who constructs indices of accessibility to employment by public transport and car for Boston using 1990 US Census data. Shen (1998) finds that employment accessibility is greater in the central city than in the suburbs for *both* public transport and car travel times, owing to the predominance of jobs in the central city. However, when these accessibility indices are combined into one general index by weighting by car ownership rates for each neighbourhood, Shen finds that the suburbs in actual fact have greater job accessibility. This apparent paradox is the result of the combination of two factors. First, car travel affords much greater average travel speeds than public transport; so much so that the neighbourhoods least accessible by car still compare favourably with neighbourhoods which are the most accessible by public transport. Second, central city neighbourhoods have much lower car ownership rates than suburban neighbourhoods. These two factors combine to mean that, on average, central city residents experience lower accessibility to employment than suburban residents, despite actually living in closer geometric proximity to jobs in terms of distance.

Taylor and Ong (1995) placed so much importance on car ownership that they entitled their paper *Spatial Mismatch or Automobile Mismatch?*. They conclude their paper by stating:

“ongoing metropolitan dispersion of employment has made the private automobile an indispensable employment tool; the data clearly show the difficulty that traditional public transit faces in adequately serving the journey to work. The importance of the automobile in providing employment access to lower-skilled, low-waged labour can hardly be overstated”
(Taylor and Ong, 1995, p.1471).

3.3.3.6 *Assumption six – that unemployment is the main outcome of low accessibility to jobs*

Unemployment rates or employment rates are the main focus of the spatial mismatch hypothesis. It is assumed that employment deconcentration in the face of residential immobility causes unemployment in metropolitan cores. However, there are outcomes of job loss, including localised job loss, other than unemployment. In particular, earnings, economic activity rates and housing costs can fall (Kasper, 1983; Zax, 1991a; Manning, 1995; Cooke, 1997).

People adjust to localised job loss in a variety of ways: some migrate; some commute further afield; some retrain; some take alternative, lower-skilled and lower-paid employment; some move into early retirement, sickness or other forms of economic inactivity; and, finally, some become unemployed. These responses, with the exception of wage adjustment, to job loss in British metropolitan cores between 1981 and 1991 were shown previously in the labour market accounts in section 3.3.3.1 (see also Turok and Edge, 1999).

If the employment rate and/or the earnings in a neighbourhood are falling, then house prices may fall in response (or at least rise slower than elsewhere). To a degree, low earnings can thus be partially ‘compensated’ by lower unit rent or mortgage repayments. Therefore, when analysing spatial aspects of labour markets it is useful to conceive of earnings *net* of housing and commuting costs (Ihlanfeldt and Sjoquist, 1989). This then

relates to a neo-classical economics framework which conceives of an equilibrium between labour demand and supply, mediated by price. Since wages are 'downwardly sticky' and often subject to national pay agreements, the price of labour is not highly responsive to changes in demand and supply at the local level (Roncaglia, 1988; Smith, 1994). However, if there is localised job loss, *net* earnings can fall by people commuting further to more distant jobs. Note, though, that this is countered by lowered earnings net of commuting feeding through to lowered unit housing costs. Hence, local housing and labour markets interact with each other and feedback mechanisms operate. This means that the outcome of local job loss can be a combination of increased net out-migration, increased net out-commuting, lowered earnings, increased (or redirected) human capital investment, increased economic inactivity, increased unemployment and lowered unit housing costs.

To be accurate, a model of dynamic processes operating in the housing and labour market of a metropolitan area needs to include all the above factors. To simply look at the relationship between the spatial distribution of jobs and the spatial distribution of unemployment is simplistic. First, as explained previously, it is the *change* in the location of employment opportunities that will give rise to disequilibrium unemployment while adjustment mechanisms take effect. Second, the other possible adjustment mechanisms to, and outcomes of, job loss outlined here need to be included.

3.3.3.7 *Assumption seven – that commuting and residential mobility are the principal spatial barriers to employment*

Work on the spatial mismatch hypothesis has been criticised for an over reliance on cross-sectional data, thus none of the dynamic processes operating in labour and housing markets through time is captured (Taylor and Ong, 1995). Most studies, either directly or indirectly, relate the spatial variation in unemployment *at a point in time* to the spatial variation in job accessibility at that point in time. Furthermore, they often make the assumption of fixed residences in order to make their methodologies fully consistent with the residential segregation assumed in the hypothesis by Kain (1968). For example, Ihlanfeldt and Sjoquist (1990) restrict their analysis to youths, based on the notion that young people are likely to have made few, if any, residential location

choices (other than staying put with their family or moving to their own accommodation close by). This, however, does not tell us if older workers can overcome space by migrating closer to suitable job opportunities.

Although potentially able to determine the overall importance of space in determining labour market outcomes at a point in time, cross-sectional studies do not shed any light on the precise mechanisms and processes through which spatial mismatch unemployment may occur, because labour market adjustment is a dynamic process operating through time. In addition, most previous cross-sectional work into the spatial mismatch hypothesis has attempted to measure the effect of 'space' in aggregate as a barrier to employment, without examining the mechanisms through which space may present a barrier to employment. In particular, the importance and nature of commuting constraints, residential immobility and job search/recruitment in producing the overall effect have not been researched in depth (Immergluck, 1998a).

O'Regan and Quigley (1998), however, attempt to differentiate between the effect of travel cost and information barriers. They measure the amount of information available to individuals by estimating the extent of social contact they have with employed people. This is done by creating an 'exposure to poverty' index based in part on neighbourhood unemployment rates. Since the dependent variable is the probability of an individual being employed, this seems somewhat tautological. However, the authors conclude that information inaccessibility is considerably more significant than simple geographical inaccessibility from employment opportunities. Note that this measures a 'neighbourhood' effect which is not dependent on the location of jobs, so is slightly different to how the role of job information should strictly be treated in the spatial mismatch hypothesis. The spatial mismatch hypothesis is concerned with how people access information about job vacancies across space as the distance between the job searchers and the jobs themselves increases. O'Regan and Quigley (1998), however, measure access to labour market information more generally.

Almost all of the spatial mismatch hypothesis literature reports work which examines the employment field of *workers*. Very little has been done on the labour sheds of

employers. An employment field refers to the catchment *to* which residents of a particular neighbourhood commute; whereas a labour shed refers to the catchment around an employer *from* which its employees commute (Morrison, 2001). The former tells us about the spatial extent of workers' jobs search, while the latter tells us about the spatial extent of employers' recruitment (mediated by residential moves of existing workers). Although obviously employment fields and labour sheds are closely related, their comparison can tell us something about the importance of job search and recruitment processes as spatial barriers to employment within metropolitan areas.

3.3.4 Conclusion

The spatial mismatch hypothesis makes seven assumptions about the nature of metropolitan deconcentration and about the operation of metropolitan housing and labour markets. The two most important of these are: that the deconcentration of employment is greater than the deconcentration of population; and second that the unemployment rates found in the cores of metropolitan areas are greater than those in the rings. However, it has been shown that these assumption both hold true in most of Britain's eight largest metropolitan areas.

Other theoretical assumptions made by the spatial mismatch hypothesis have strong methodological implications if not controlled for adequately, as demonstrated in the prior discussion. In general, most of these assumptions stem from the fact that the spatial mismatch hypothesis does not explicitly consider the processes operating through time to produce certain cross-sectional associations, or lack of them. The spatial mismatch hypothesis does not have a strong theoretical underpinning in either urban or labour economics (Arnott, 1998). In addition, the aggregate, quantitative and cross-sectional approach generally taken by most of the spatial mismatch hypothesis literature has not shed light on the importance and precise nature of different spatial barriers to employment within metropolitan areas. In particular, the relative importance of commuting, residential mobility and job search/recruitment has not been investigated in depth.

3.4 A conceptual framework in which to understand the spatial distribution of unemployment within metropolitan areas

This section develops a conceptual framework in which to locate the spatial mismatch hypothesis, incorporating the labour market, the housing market, urban form and the mechanisms by which space may present a barrier to employment. This framework seeks to address the limitations of the skills mismatch perspective and the assumptions of the spatial mismatch hypothesis, and in so doing develop a conceptual framework which accommodates both.

As illustrated in the previous sections, a more comprehensive conceptual framework than that provided by the spatial mismatch hypothesis is required in which to understand the processes creating the observed spatial pattern of unemployment within metropolitan areas. The focus of this study is to better understand the mechanisms through which space may present a barrier to employment and the *processes* which create the observed spatial pattern of unemployment, economic inactivity and low pay within metropolitan areas. The spatial mismatch hypothesis in general creates the impression of metropolitan labour markets consisting of segmented sub-markets, both occupationally and spatially. This is realistic to an extent, but there is substantial occupational, transport and residential mobility within metropolitan areas. Furthermore, people with higher skills have a greater degree of occupational mobility owing to the ability to 'bump down' the skills ladder (Gordon, 2002), and members of higher skilled occupational groups also tend to have greater transport mobility (McLafferty and Preston, 1997) and residential mobility (Cadwallader, 1992). These factors need to be conceptually and methodologically accommodated within the spatial mismatch hypothesis.

A key empirical question is how powerful are barriers to such types of mobility, and which groups of people face those barriers the most acutely. This thesis seeks to establish the nature and magnitude of specific types of spatial barrier to employment, and to establish which groups of people are affected the most.

Residential mobility within metropolitan areas, individuals' human capital investment decisions, and changing commuting patterns are likely to be influenced by the spatial configuration of local labour and local housing markets and transportation systems. There are therefore strong links between urban form, and housing and labour markets. A conceptual model of the links between urban form, and housing and labour markets is presented in figure 3.1, drawing on analytical frameworks from urban economics and labour economics.

A convenient way to read the diagram is to simultaneously start at the top left and right hand corners (*aggregate supply of new housing*, and *aggregate labour demand* respectively) and move diagonally downwards to meet at *transport infrastructure* and then read downwards from there. The housing market is represented to the left and the labour market to the right of the central column. A solid arrow pointing from box *a* to box *b* indicates a positive effect of *a* on *b* (i.e. an increase in *a* causes an increase in *b*), while a broken arrow indicates a negative effect (i.e. an increase in *a* causes a decrease in *b*). Arrows from a price box to a demand or supply box indicate *movement along* the demand or supply curve. Arrows from a demand or supply box to a price box indicate a *shift of the curve* itself.

The model shows that the location of jobs within an urban area attracts population (and vice-versa) because people seek to maximise their wage net of commuting costs (Morrison, 2001). The increased demand for housing associated with proximity to employment, and higher wages providing the ability to pay for housing, increase the cost of housing in neighbourhood *i*. Employers in inaccessible locations might need to pay higher wages in order to attract workers to commute or move house there. There is some evidence that this is the case in Detroit (Zax, 1991a), Glasgow (Kasper, 1983) and south-east England (Forrest and Murie, 1994). Lower income workers, through lower ability to pay for housing and through residential segregation processes in the housing market, are *partially* 'compensated' with lower unit housing costs (Zax, 1991a). However, commuting costs, wages and housing costs do not reach total equilibrium. If this was the case, wages net of commuting and housing costs would be equal across an urban area. If wages, net of commuting and housing costs, fall below that available

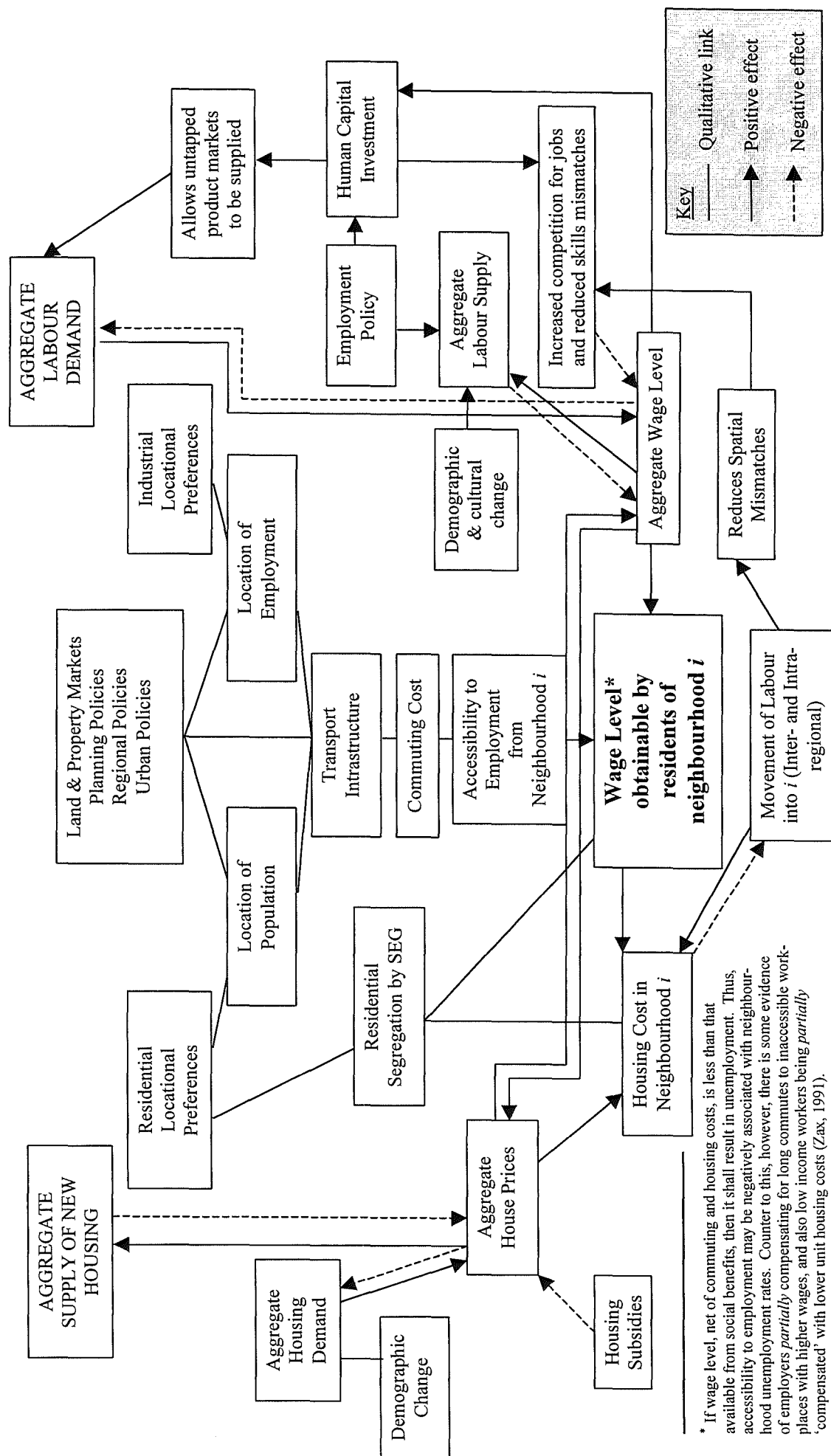
from social benefits, then unemployment results (Aronsson and Brannas, 1996). Thus, inaccessible locations have higher equilibrium unemployment (Molho, 1995).

However, in a situation of aggregate excess labour supply, employers in less accessible locations within regions are unlikely to need to compensate workers for long commutes, as there is likely to be adequate local labour availability. Therefore, house prices may become the primary mechanism to compensate for low pay. Also, if employers in less accessible locations are not compensating for long commutes, then living close to employment centres becomes important in keeping individuals' wages net of housing and commuting costs above benefit levels, i.e. in keeping individuals out of unemployment. Thus, the journey to work may become a stronger barrier to employment in a depressed high unemployment/ low-wage local labour market.

This process is not solely driven by employment accessibility, of course. Residential segregation by socio-economic group through the housing market also concentrates people on low pay and prone to unemployment together in the same neighbourhoods, consistent with the skills mismatch perspective. Processes of property decline and associated housing filtering may then set in (Megbolugbe et al, 1996). Local labour markets are differentiated by occupation and industry. Therefore, the magnitude of effects in this model depend upon a given individual's socio-economic group. Thus, a three-dimensional version of this model could be envisaged, with multiple layers for different socio-economic groups laid on top of one another. There would be links between the layers, notably aggregate demand, supply and prices of labour and housing.

People would be able to move up layers through human capital investment, or move down layers through 'bumping down' to jobs they are over qualified for. The concentration of over qualified labour in lower-skilled jobs means those in the lowest group have nowhere to 'bump down' to. Thus, the balance between labour demand and supply in all occupations impacts most on the bottom of the labour market, and accounts for the concentration of unemployment among the unskilled (Gordon, 1999). Political pressure, social norms, the cost of living and benefit levels make it difficult for wages at

Figure 3.1 Conceptual model of labour and housing market interactions with reference to neighbourhood i



the lowest end of the spectrum to fall any further (Fine, 1998). People are also unable to save to be able to invest in human capital. Thus, for the lowest socio-economic group, the operation of the labour market probably *cannot* be represented through conventional demand, supply and human capital as depicted in the model. They carry the weight of the shortfall in labour demand in all the layers above them.

This conceptual framework is consistent with everyday experience of disadvantaged neighbourhoods having a high proportion of residents in low socio-economic groups, a high unemployment rate, low pay and low unit housing costs (Hill and Bier, 1989). This model can also be described in mathematical terms, as laid out in the equations which follow.

Webster (1994) empirically showed in the Glasgow conurbation that the likelihood of a resident of neighbourhood i working in another given area is inversely proportional to the square of the distance between those two areas. Thus, assuming commuting cost and time are considered in people's residential and employment decisions, the demand, and thus price, of housing in neighbourhood i will be proportional to the proximity of jobs and alternative housing, as shown in equation four:

$$HC_i \propto \frac{J_i + \sum_{j=1}^{j=n} J_j / c_{ij}^2}{HQ_i + \sum_{j=1}^{j=n} HQ_j / c_{ij}^2} + NLHD \quad (4)$$

Where:

HC_i = Housing cost in neighbourhood i ($i=1, 2, 3, \dots, n$)

$J_i(j)$ = Jobs in neighbourhood i and in each other neighbourhood j ($j=i-1, \dots, n-1$)

$HQ_i(j)$ = Housing quantity in neighbourhood i

c_{ij} = Commuting cost from i to j

$NLHD$ = Non labour housing demand

Assuming compensation for low incomes with low unit housing costs (through ability to pay, negative neighbourhood externalities and residential segregation), wages (or pay,

denoted by P) obtainable by residents of neighbourhood i can be represented as shown in equation five:

$$P_i \propto HC_i + \frac{ALD}{ALS} \quad (5)$$

Where:

P_i = Wages obtainable by residents of neighbourhood i

ALD = Aggregate labour demand

ALS = Aggregate labour supply

Finally, in the case of excess aggregate labour supply in a metropolitan area as a whole, when employers do not need to fully compensate for longer commutes to attract sufficient numbers and quality of staff, residents of low job accessible neighbourhoods have their wages net of commuting and housing costs taken closer to their reservation wage, thus are more likely to become unemployed. Thus, neighbourhood unemployment rate is proportional to job accessibility. Substituting, HC_i for job accessibility from equation four, neighbourhood unemployment rate is proportional to local housing costs, as shown in equation six:

$$U_i \propto \frac{1}{HC_i} + \frac{ALS}{ALD} \quad (6)$$

Where:

U_i = Unemployment rate in neighbourhood i

Inserting equation five for HC_i , we get:

$$U_i \propto 1/P_i \quad (7)$$

The inverse relationship between wages and unemployment rate shown in equation seven was also found to exist at the regional level in many different countries both

across space and through time (Blanchflower and Oswald, 1994). This relationship was termed the Wage Curve by Blanchflower and Oswald (1994).

The 'Neighbourhood Wage Curve' shown in equation seven is likely to be arrived at by slightly different mechanisms than the regional level Wage Curve. However, the underlying importance of the demand for labour as the driver of labour market outcomes is the same in the two cases.

The 'Neighbourhood Wage Curve' as shown in equation seven does not assume a closed system as in the case of Blanchflower and Oswald's regions. Equation seven includes the effect of commuting to jobs outside of the neighbourhood. Assuming uniform wages for similar work across a metropolitan area (which will be the case when there is an overall surplus of labour removing the need for employers in less accessible locations to pay higher wages), then wages net of commuting costs will be lower in less accessible neighbourhoods. Residents who face greater commuting costs will have higher reservation wages, thus will on average experience lower wages net of commuting and higher unemployment, as shown in equations four to seven.

3.4.1 Conclusion

This section has drawn together some of the themes from the discussion of the skills mismatch perspective and the spatial mismatch hypothesis into a more comprehensive conceptual framework in which to develop a methodology for testing the spatial mismatch hypothesis. It has highlighted the importance of thinking about the processes operating through time. Also important are the interactions between the deconcentration of employment and population, commuting, the local labour market and the local housing market within metropolitan areas. Thus, an examination of the nature and importance of different types of spatial barrier to employment needs to consider processes operating through time, and needs to link employment choices and outcomes to travel choices and housing choices and outcomes.

Many authors conclude their work with calls for research into the processes operating to cause spatial barriers to employment (e.g. Holzer et al, 1994; Cooke, 1996; Immergluck,

1998b; Shen, 1998). This section of this chapter has developed a conceptual framework incorporating the housing market, urban form and the mechanisms by which space may present a barrier to employment.

The overall aim of this thesis is to test the spatial mismatch hypothesis in a British metropolitan area. The specific research objectives are:

- 1) to establish whether there are commuting constraints within metropolitan areas which cause some people to become unemployed;
- 2) to establish whether there are constraints on residential mobility within metropolitan areas which prevent some people from migrating to be closer to suitable jobs; and
- 3) to establish if job search and/or recruitment processes present spatial barriers to employment within metropolitan areas.

The following chapter develops an innovative methodology which seeks to guard against the pitfalls and drawbacks highlighted in previous work. This methodology can also assess the relative importance of commuting, residential mobility and job search/recruitment as barriers to employment within metropolitan areas.

3.5 Summary and conclusions

This chapter has outlined the skills mismatch perspective and the spatial mismatch hypothesis as means of understanding the spatial distribution of unemployment within metropolitan areas. The skills mismatch perspective stresses the supply side of the labour market by focusing on the characteristics and behaviour of the unemployed themselves to the exclusion of a consideration of the demand for labour. It argues that there is a mismatch between the skills held by the unemployed and the skills required by employers. In the metropolitan context, the skills mismatch perspective relies on the housing market to concentrate people with low skills together in certain neighbourhoods.

The spatial mismatch hypothesis states that concentrations of unemployment in US central city areas exist in part because of the deconcentration of employment in the face of residential segregation which prevents the migration of central city residents to areas of greater labour demand in the suburbs (Kain, 1968). Applied in Britain, the low residential mobility found among tenants in the social rented sector, due to administrative obstacles to migration, forms a parallel with racial segregation in the US, caused by discrimination in suburban housing markets. However, recent evidence in the US suggests that the spatial mismatch hypothesis applies to low income central city residents, of all racial groups, including whites.

Unemployment is closely associated with low skill levels. Therefore, the skills mismatch perspective provides a useful means to explain which groups are at most risk of unemployment. However, the skills mismatch perspective has three main limitations. First, it does not provide a direct explanation of the spatial distribution of unemployment within metropolitan areas. Second, it neglects to consider that the demand for lower-skilled labour has fallen while that for higher skilled work has risen. Because there are barriers to occupational mobility, this may partially explain the correlation between low skill and unemployment. Third, it does not take into account spatial frictions within metropolitan labour markets.

The spatial mismatch hypothesis builds upon the skills mismatch perspective by introducing the spatial distribution, and changing spatial distribution, of jobs within metropolitan areas. The spatial mismatch hypothesis should not be seen as an alternative to the skills mismatch perspective, but rather as a complement to it. The spatial mismatch hypothesis enhances the skills mismatch perspective by directly addressing each of these three limitations associated with the skills mismatch explanation of urban unemployment.

However, the spatial mismatch hypothesis makes seven assumptions about metropolitan deconcentration and about the operation of metropolitan housing and labour markets. Two of these, if false, would seriously challenge the spatial mismatch hypothesis. First, the spatial mismatch assumes that the deconcentration of employment is greater than the

deconcentration of population therefore depleting the number of jobs per worker found in metropolitan cores. Second, the hypothesis also assumes that the unemployment rates found in the cores of metropolitan areas are greater than those in the rings. The other five assumptions need to be adequately taken account of by careful methodological design in order not to introduce systematic biases into findings. Much previous spatial mismatch work has treated space in an aggregate manner, a result of which has been that the relative importance of commuting, residential mobility and job search/ recruitment as spatial barriers to employment within metropolitan areas remains largely uninvestigated. In addition, this chapter has highlighted the importance of thinking about the processes operating through time rather than relying on cross-sectional relationships between variables.

This chapter went on to draw together some of the themes from the discussion of skills and spatial mismatches into a more comprehensive conceptual framework in which to develop a methodology for testing the spatial mismatch hypothesis. This highlighted the importance of thinking about the processes operating through time. Also important are the interactions between the deconcentration of employment and population, commuting, the local labour market and the local housing market within metropolitan areas.

The evidence in relation to the spatial mismatch hypothesis is mixed, therefore it remains contested. The importance of spatial mismatch in determining the unemployment rates of inner city neighbourhoods has not been investigated in Britain, except for a small number of studies in relation to ethnic minority groups. Therefore, researching the spatial mismatch hypothesis in a British metropolitan area has the potential to considerably enhance existing understanding. This thesis has identified the following specific research objectives within the broader aim of testing the spatial mismatch hypothesis in the British context:

- 1) to establish whether there are commuting constraints within metropolitan areas which cause some people to become unemployed;

- 2) to establish whether there are constraints on residential mobility within metropolitan areas which prevent some people from migrating to be closer to suitable jobs; and
- 3) to establish if job search and/or recruitment processes present spatial barriers to employment within metropolitan areas.

Part two of this thesis now examines the methods and data used by previous studies to test the spatial mismatch hypothesis, and explains and justifies the choice of methods and data for this work. More specifically, the following chapter (chapter four) outlines the main methodologies which have been used to date to test the spatial mismatch hypothesis, and identifies their weaknesses. It then outlines a robust methodology to address the three research objectives set out above. Chapter five outlines the data requirements of this work, and explains how data were collected.

PART II – METHODOLOGY AND DATA

4. METHODOLOGY

5. DATA REQUIREMENTS AND DATA COLLECTION

4. METHODOLOGY

4.1 Introduction

The preceding chapter identified seven assumptions made by the spatial mismatch hypothesis in explaining the spatial distribution of unemployment within metropolitan areas. These assumptions have implications for the validity of the methods which have been used to explain skills and spatial mismatches in producing the observed pattern of unemployment rates within metropolitan areas. The conceptual framework outlined in the previous chapter, which should be borne in mind throughout the remainder of this thesis, provides a context in which to locate the interactions between skills and spatial mismatches and, by introducing time through which processes occur to the model, addresses the most important limitations of the skills mismatch perspective and the spatial mismatch hypothesis. This conceptual model in general terms guides the design of the methodology designed here to test the spatial mismatch hypothesis.

This chapter starts by summarising the three main methods which have been used to explain the spatial distribution of unemployment within metropolitan areas, with particular reference to the spatial mismatch hypothesis. The problems associated with each of these methods are explained in relation to the theoretical assumptions of the spatial mismatch hypothesis identified in the previous chapter that each method leaves exposed. The firm relocation approach adopted in this study is then explained and justified as an appropriate method with which to examine the three research objectives of this study.

Ten specific hypotheses to be tested in examining firm relocations within the Glasgow conurbation are outlined in relation to the three research objectives of this study. The weaknesses of the firm relocation approach are then highlighted and methods to deal with those weaknesses are explained. The suitability of the Glasgow conurbation in which to test the spatial mismatch hypothesis is then justified. The following chapter then provides an account of how the firm relocation approach was operationalised.

4.2 Previous approaches

The previous chapter introduced some of the methods which have been used to test the spatial mismatch hypothesis. These can be categorised under three main headings: comparison of commuting times; comparison of earnings; and measures of job proximity. The basis of each of these three approaches and their weaknesses are recapitulated here.

4.2.1 *Comparison of commuting times*

This methodology is widely used in the spatial mismatch literature, particularly the earlier studies (Holzer, 1991). The concept behind this methodology is that if there is spatial mismatch between the residences of the unemployed in metropolitan cores and appropriate lower-skilled and manual employment opportunities in metropolitan rings, then core residents, *ceteris paribus*, shall commute further (and hence longer in time) than their counterparts in the ring, owing to the greater distance between where lower-skilled and manual workers live and where lower-skilled and manual job openings are more plentiful (McLafferty and Preston, 1996). This methodology has the benefit of focusing on commuting, which is at the heart of the spatial mismatch hypothesis. However, this methodology has three key problems associated with it.

First, long commutes can be either evidence of high mobility (such as that enjoyed by highly paid workers), or can be evidence of physical mismatch between workers and jobs. If mismatch is severe, then residents of inaccessible neighbourhoods may be constrained to a small number of local jobs, resulting in shorter commutes (Fernandez, 1994). Commuting a long distance suggests that people, although spatially removed from job opportunities, are able to overcome that distance. Thus, longer commutes from the central city may show that there is geographical mismatch, but they do not show that it causes unemployment. Therefore, the relationship between commuting time from neighbourhoods and neighbourhood unemployment rates must be established in order to determine if inaccessibility does indeed constitute a problem, which some studies do (for example, Cooke, 1997).

A second problem with the comparison of commuting times methodology is that different groups have different propensities to commute. It has been well documented that the following groups of people have lower propensities to commute, over and above the effect of their greater reliance on public transport: lower-skilled workers (Gordon et al, 1989), lower income workers (Ihlanfeldt, 1993; Holzer et al, 1994), and women (Hanson and Pratt, 1988) and that this contributes to the disadvantage experienced by these groups in the labour market (Thompson, 1997). In some senses, this is in direct contradiction to the commuting times methodology which assumes that *long* commutes, *ceteris paribus*, reflect labour market disadvantage (Wyly, 1996). This stems from a lack of distinction in some research between physical mismatch in geometric terms and the variable ability of workers to overcome that mismatch by commuting.

To illustrate the complexity of taking accurate account of variations in mobility, consider the following example. Ihlanfeldt and Sjoquist (1990) restrict their analysis of mean commuting times from different US census tracts by using automobile commute time only, with the aim of eliminating a bias introduced because central city residents are more likely to travel to work by public transport. This justification of using mean automobile commuting times warrants scrutiny. The idea that using times relating to only one mode of travel will eliminate variations between census tracts with different mode shares is misconceived. Ihlanfeldt and Sjoquist (1990) produced an accurate measure of the geometric proximity of employment to neighbourhoods in terms of physical *distance*, based on the notion that most car travel is done at a similar speed (which is consistently faster than that by public transport). They have *not* produced a measure of people's ability to *travel* to employment. Indeed, they have unwittingly introduced a systematic bias in their results, ironically by eliminating the very data they were rightly concerned about. Using only automobile commute times means that neighbourhoods with low car ownership have the availability of jobs to them overstated in this study, because most of the residents cannot travel as far as the mean automobile commute times suggest. Since central city census tracts have lower car ownership and higher unemployment rates than other areas, the effects of employment deconcentration on central city neighbourhoods' unemployment rates found by Ihlanfeldt and Sjoquist are understated.

A third problem with the comparison of commuting times methodology is that it is difficult to accurately control for other factors which influence how far people commute, as they tend to be closely collinear with risk of unemployment, for example being in manual or lower-skilled occupations. In addition, some subtle but important characteristics of workers are very difficult to control for (Fernandez, 1994). In particular, the quantity and quality of work experience individuals have is usually unknown. Furthermore, Fernandez (1994) argues, the subjective characteristics of workers are immeasurable, and it is these, such as attitude and initiative, on which employers place much value. Fernandez (1994) argues that using longitudinal data which follows the same individuals through time gets around the problems of selective migration explained in the previous chapter and the need for technically complex controls. Indeed, this problem of accurately controlling for workers' characteristics, particularly subjective characteristics which are difficult to measure, is present when examining cross-sectional associations between employment outcomes and any measure of the proximity of employment, not only travel times.

4.2.2 Comparison of earnings

An alternative methodology to test the spatial mismatch hypothesis is to compare, *ceteris paribus*, the wages offered by employers in the central city with wages offered by suburban employers. The logic behind this methodology is that if there is a greater labour surplus relative to locally available jobs in the central city, then wages there will be lower than in the suburbs (Ihlanfeldt and Sjoquist, 1989). In tight local labour markets, labour costs are potentially a good indicator of the balance between labour demand and supply, as there is not a spatially ubiquitous surplus of labour to restrain wage levels.

To directly measure wage adjustment, it is more appropriate to measure workplace-based rather than residence-based wages, but data relating to this in the US are limited, particularly for small geographical units (Ihlanfeldt and Sjoquist, 1989). Therefore, Ihlanfeldt and Sjoquist (1989) used residence-based earnings data net of commuting as a proxy for workplace-based earnings, based on the fact that people will only commute

further afield than necessary if they earn higher wages as a result. Across US metropolitan areas, they find that both black and white central city residents earn less in the metropolitan areas which have experienced the greatest employment decentralisation.

Zhiang (1998) derived workplace-based earnings data for Cleveland from the Ohio Bureau of Employment Services' unemployment compensation tax records filed by firms. Wage gradients with distance from the CBD for most industries were insignificant, and for some industries were negative, rather than positive as the spatial mismatch hypothesis would predict.

Limited data availability on workplace-based wages aside, this methodology has five weaknesses. First, it assumes that the core city does indeed have lower geographical accessibility to jobs than suburban areas, as this is not explicitly tested in this methodology (Carlson and Persky, 1999). Second, wages may not be responsive to labour demand and supply conditions. Third, if employers in low unemployment suburban labour markets do indeed need to offer higher wages to attract people to commute from further afield, then this could be argued to be evidence that wage adjustment allows people to overcome spatial mismatch.

Fourth, there may be other reasons for suburban employers to pay more, for example a greater demand for their goods or services thus a larger profit margin from which to increase wage levels, or the superior skills of the suburban workforce. This latter point is particularly salient as it would lend support to the skills mismatch perspective.

The fifth weakness of the comparison of earnings methodology is that it does not take into account the other mechanisms by which lower accessibility to employment could be ameliorated. For example, workers on lower wages may be partially 'compensated' with lower unit housing costs and shorter commutes (Zax, 1991a). Thus, an observed differential in pay between locations may overstate the actual differential in the socio-economic status experienced by workers.

4.2.3 Measures of job proximity

Studies in a recent wave of spatial mismatch research since the mid 1990s have increasingly utilised measures of the proximity of jobs to high unemployment areas, and the geographical accessibility of those jobs (for example, Hanson et al, 1997; Rogers, 1997; Immergluck, 1998a). Measuring the geographical accessibility to jobs from different areas, and then relating that to the level of unemployment found in those areas gets around the problem of the need to make strong claims based on commuting and earnings data. Such claims are difficult to interpret owing to interactions with unemployment level, with each other and with housing costs, as explained in the conceptual framework in the previous chapter and in the previous section of this chapter. The logic behind using a measure of job proximity is transparent and is on a stronger conceptual footing than the comparison of commuting and comparison of earnings approaches, as it directly measures the degree of spatial mismatch between the location of jobs and the location of the unemployed.

The job proximity approach directly introduces the local demand for labour. The strength of the relationship between local unemployment and the local demand for labour is a good measure of 'spatial mismatch' unemployment at a point in time. Models which also include variables to describe the characteristics and skills of neighbourhoods' workforces thus clearly identify the demand side and the supply side influences on neighbourhood unemployment rates, and incorporate both skills and spatial mismatches.

However, measures of job proximity have five specific weaknesses. First, the measurement of job proximity is limited by data and computational constraints (Immergluck, 1998c). A methodological problem arises because it is simpler to measure the characteristics of the workforce in a neighbourhood than it is to measure the accessibility to employment from that neighbourhood. This means that the supply side 'skills' variables are more accurately measured in many studies than demand side 'job access' measures. Supply side measures are direct and relatively unambiguous, for example "x% of a neighbourhood's workforce is unskilled", whereas demand side measures are usually proxies for job vacancies, often of dubious direct relevance or

accuracy, for example the number of redundancies in a particular neighbourhood used by Metcalf and Richardson (1976), which was intended to reflect changes in the demand for labour in different local areas within London.

Metcalf and Richardson (1976) examined cross-sectional variations in unemployment rates between the 32 London boroughs in 1971. They used the following supply side independent variables: age profile; per cent married; child dependency ratio; per cent immigrants; and per cent unskilled. They used three demand side variables: first, 1966 employment in manufacturing (based on the fact that many manufacturing jobs were lost between 1968 and 1971); second, the number of male redundancies 1966-9; and finally, the number of male redundancies in 1970. Clearly these demand side variables are indirect proxies of the actual availability of work, whereas the supply side variables are much more accurate measures of the characteristics of boroughs' workers. This introduces a bias against finding a spatial demand side effect on boroughs' unemployment rates.

The second problem with measures of job proximity is that the measurement of accessibility itself is difficult to specify. Two particularly complex issues relate to the treatment of 'distance decay', and to the level of competing labour in different locations. 'Distance decay' functions take account of the fact that jobs in a given location within a metropolitan area are more likely to be held by a resident of a more proximate neighbourhood (for example, see Webster, 1994), by attaching less 'weight', or importance, to more distant jobs. However, some measures simply use an arbitrary cut-off, so only count the number of jobs available within a certain distance of a given neighbourhood and ignore the rest (for example, Immergluck, 1998b). Variation in the level of locally competing labour further complicates the specification of accessibility measures. As explained in the previous chapter, some measures of accessibility to employment fail to weight jobs by the level of local competing labour. Since population density is greater in metropolitan cores than in the rings, this overstates the number of jobs per worker in the core, and thus introduces a bias against finding evidence in support of the spatial mismatch hypothesis (Houston, 1998).

The third difficulty with measures of job proximity is the problematic nature of the measurement of the 'friction of distance'. Total travel burden comprises travel time, pecuniary cost and inconvenience (Bruzelius, 1979). Thus, time, cost or distance, especially straight-line distance, are all incomplete measures. Time, cost or distance, but particularly distance, are not only poor *absolute* measures of total travel burden, but also poor indicators of *relative* differences between the friction of difference between different points, as the correlation between them is not likely to be strong owing to barriers such as rivers and spatial variation in average travel speeds across a metropolitan area.

Furthermore, there are systematic biases introduced by the use of distance, particularly straight-line distance, which mask evidence of the spatial mismatch hypothesis (Houston, 1998). Straight-line distance is obviously an underestimate of that actually travelled on the ground. Straight-line distance approximates to actual distance travelled more closely for longer trips because detours around obstacles tend to be smaller relative to the length of the trip. Over longer trips, some portions are able to be made in a straight line, or deviating relatively less from the straight line path (Webster, 1994). So, straight-line distances understate actual travel distance proportionately more for shorter trips. This means that if suburban residents travel further to work than residents of the core, as is generally the case, then core residents' job accessibility has been given relatively more weight, thus understating the relationship between high suburban employment rates and job accessibility.

Distance is not a good proxy for total travel burden. Distance is not closely correlated with time spent travelling, as congestion is experienced in different magnitudes at different parts of an urban area. This may disproportionately apply to residents of high unemployment inner city areas, who may experience congestion over a greater proportion of their journey to work than other residents. Distance is not closely correlated with the financial cost of travel either, particularly by public transport where a flat fare can apply over considerable distance. Furthermore, when considering public transport trips, the orientation of trips is important. Many public transport services radiate out from city centres. Trips to be made by public transport which are not along

such radial axes may require travel towards the city centre and then interchange with another service, or the use of a low frequency service which does link such adjacent areas. As inner city residents use public transport for a higher proportion of their trips than suburban residents, using distance as a proxy for travel cost and travel time underestimates travel barriers faced by inner city residents more than it does suburban residents. Thus, the availability of jobs to high unemployment areas is further overstated.

The fourth problem with using measures of job proximity in order to test the spatial mismatch hypothesis is that job seekers apply for job vacancies, not jobs. Unfortunately in Britain, job vacancy data are not accurately available for small areas within metropolitan areas (Gore and Herrington, 1997). Furthermore, there is no obligation on employers to notify job vacancies to a Job Centre (from which the UK job vacancies data are produced). This means that notified vacancies represent typically around a third of actual vacancies (Greater Manchester Low Pay Unit, 1999) and this proportion is likely to vary significantly between small areas within a metropolitan area depending on the behaviour of the individual firms located there.

Because of these data constraints, jobs are usually used in accessibility measures as a proxy for vacancies. However, this causes a bias because, *a priori*, occupations for which demand is falling will, *ceteris paribus*, have a lower vacancy rate than those expanding. As employment is deconcentrating within metropolitan areas, the use of jobs as a proxy for vacancies overstates the availability of vacancies to residents of metropolitan cores. Another bias is caused by variation in the staff turnover rate of different types of job. As staff turnover is generally higher in lower-skilled jobs (Immergluck, 1998a), this understates the availability of vacancies to residents of metropolitan cores. Because these biases operate in opposite directions, it is unclear to what extent this is a problem.

Finally, most measures of job proximity do not incorporate *changes* in the location of jobs. This is central to the spatial mismatch hypothesis which emphasises the

deconcentration (i.e. change through time) of employment opportunities within metropolitan areas.

4.2.4 Conclusions

Each of the above three methodologies used to test the spatial mismatch hypothesis faces the problem of not capturing any of the processes operating through time to create spatial inequalities in unemployment rates. This is because they rely on assessing relationships between variables at a point in time using cross-sectional data, which makes the interpretation of relationships ambiguous.

Although potentially able to determine the overall importance of space in determining labour market outcomes at a point in time, such aggregate cross-sectional studies do not shed any light on the relative importance of commuting constraints, residential mobility and job search/recruitment in producing the overall effect. Longitudinal and micro level approaches offer the potential to gain a richer understanding of the processes at work in local labour markets, and to shed light on the relative importance of these possible spatial barriers to employment within metropolitan areas. It is to these methods that the discussion now turns.

4.3 An alternative approach – ‘natural spatial experiments’

Certain changes in urban structure constitute a change in the spatial relationship between home and workplace while *nothing else changes* (Fernandez, 1994). The three principal means by which such exogenous spatial changes occur are:

- 1) significant improvements to transport infrastructure, for example a new dual carriageway, new river crossing or new rail line;
- 2) forced housing relocation, for example as the result of slum clearance; and
- 3) firm relocations, i.e. the movement of firms into new premises within the same metropolitan area.

Exploiting these as spatial experiments avoids the problem of selective migration influenced by employment deconcentration as outlined in the previous chapter, by

focusing on a *fixed set of particular individuals* and following their responses *through time* to a spatial change in the relationship between home and workplace (Fernandez, 1994). Thus, the significance of space for workers' commuting and residential mobility is isolated by holding other factors constant in a controlled experiment.

Because the spatial experiment approach tracks the same individuals through time, the problems of controlling for different modes of travel and for different commute propensities are also avoided. The comparisons of travel time, comparison of earnings and measurement of job proximity approaches outlined previously all compare people who live in certain neighbourhoods with those who live in other neighbourhoods. The characteristics of populations vary across space and cannot be reliably controlled for due to multi-collinearity between a number of characteristics associated with unemployment and, specifically in relation to testing the spatial mismatch hypothesis, because selective migration may in part be driven by the deconcentration of employment. In addition, intangible skills and characteristics of workers are often valued highly by employers such as attitude and personal appearance, which are difficult to objectively measure, particularly using secondary sources. Natural spatial experiments avoid these problems because they compare the behaviour of *the same people* before and after a change in the urban landscape (Fernandez, 1993). Therefore, this approach isolates the effect of space on workers.

Natural spatial experiments have the further benefit of looking at changes through time so capture some of the processes occurring through time of housing search and of job search and recruitment, rather than only looking at cross-sectional data at a point in time. By using individual-level data over a period of time, people's responses to overcome space in different ways can be investigated. In other words, the relative importance of commuting and migrating can be assessed as spatial obstacles to employment within metropolitan areas. For example, in the case of firm relocations, if commuting is not a barrier to employment, then people will commute to the new sites. If residential migration is not a barrier, then people will move house in order to overcome commuting constraints. In addition, the recruitment patterns of employees

can be analysed to shed light on the role of job search/ recruitment as a spatial barrier to employment.

However, exploiting 'natural spatial experiments' to test the spatial mismatch hypothesis has two principal drawbacks. First, the propensity of individuals to leave their job because it relocates or because they are forcibly required to move house may be influenced by the level of alternative employment opportunities available to them locally (Zax, 1989). Similarly, in the case of a transport improvement, an individual who resides in a job-rich neighbourhood may not need to take advantage of the increased mobility brought by the new transport infrastructure (Zax, 1990).

The second drawback with natural spatial experiments is that, because they usually involve case studies and utilise micro level data rather than secondary data which relate to the whole of a metropolitan area, it is more difficult to generalise from the findings. In other words, a 'natural spatial experiment' only provides information on the impact on a certain group of individuals affected by a particular change in urban structure. It does not provide information on the overall level of spatial mismatch within a metropolitan area and the relationship between job proximity and unemployment rates. It does, however, provide an accurate assessment of the significance of different types of spatial barrier to employment for different groups of people.

Indeed, a natural spatial experiment is not dependent on the changing spatial distribution of employment opportunities. The firm relocation methodology, for example, could equally validly be applied in a rural area to assess the extent of spatial barriers to employment. Thus, this low level of generalisability to the rest of an area in which the methodology is applied is a weakness, but also allows the methodology to be applied in non-metropolitan contexts.

Neither is a natural spatial experiment dependent on a particular spatial distribution of unemployment within an area. The method robustly tests the relative importance of different spatial barriers to employment, without explicitly analysing the implications of those barriers for the spatial pattern of unemployment found in a particular area.

Therefore, when applied to the spatial mismatch hypothesis, as with the comparison of commuting times and earnings, a natural spatial experiment is dependent on the assumption that the deconcentration of employment within the metropolitan area in question has been greater than that of population (i.e. competing workers), thus reducing the availability of jobs per worker in the metropolitan core. If there are less jobs per worker available in the core than there were in the past, and the natural spatial experiment shows there to be spatial barriers to employment, then the deconcentration of employment will have, *a priori*, caused the unemployment rate found in the core to be higher than it would have been otherwise.

Natural spatial experiments have not often been exploited in order to assess spatial barriers to employment and as such reflect a relatively innovative methodology in which to test the spatial mismatch hypothesis. The following three sections provide a brief outline of the studies which have used each of the three types of natural spatial experiment in order to test the significance of space in determining labour market outcomes. Some of these studies have been in Britain, although they do not make explicit reference to the spatial mismatch hypothesis, being rooted in more general theories of local labour markets and urban form.

4.3.1 Transport improvements

Gore and Herrington (1997) assessed the labour market impact of the opening of the South Yorkshire Supertram (SYS) in Sheffield. The authors compared the journey to work of those who were employed with certain employers prior to the opening of the SYS with that of those who were recruited since the tram started running. The hypothesis behind this was that those recruited after the tram system opened would live further from work due to enhanced accessibility to employment brought by the tram.

Survey years were 1994 and 1996. The SYS's operation was gradually introduced between March 1994 and September 1995. Employers participating in the study provided personnel records which allowed individuals to be matched between the two years. Gore and Herrington produce the results shown in table 4.1.

Table 4.1 shows that people recruited since the SYS opened travel, on average, much further to work than those still in the same job as they were in before the SYS opened. This suggests that the construction of the SYS has opened up new labour markets to people in Sheffield.

Table 4.1 Distribution of distance to work of retained staff and new recruits, Gore and Herrington (1997) *n=16,000*

Distance ('crow-flight' km)	Retained staff (%) ¹	New recruits (%) ²	Difference (% Points)	Difference (% Change)
<5	53.8	43.7	-10.1	-18.8
5-9	28.2	21.8	-6.4	-22.7
10-19	14.1	14.0	-0.1	-0.7
>20	3.9	20.5	16.6	425.6
Totals	100.0	100.0		

¹Those still with their 1994 employer in 1996.

²Those recruited by their 1996 employer between 1994 and 1996.

4.3.2 Forced housing relocations

Kasper (1973) measured the labour market costs of forced housing relocation within public rented housing in Glasgow. In the 1970s, the housing authority was demolishing poor quality social housing. Hence, residents were forced into changing their place of residence, with limited say over where they were rehoused (Kasper, 1973). At the time of Kasper's work, the housing authority took no account of where residents worked in deciding where to rehouse them, making this a good natural spatial experiment.

Kasper's method was to compare forced movers with voluntary movers in terms of the impact the move had on journey to work costs, earnings, housing costs and unemployment among the sample group. He found that the forced movers experienced an adverse impact on all four of these categories. Note that a high proportion of the workers in social rented accommodation scheduled for demolition were likely to have been lower-skilled, low waged, and prone to unemployment prior to being rehoused, although Kasper showed that their situation was made worse still by being rehoused.

4.3.3 Firm relocations

A firm relocation provides an opportunity to directly measure workers' ability to commute or migrate to distant jobs. Because the journey to work is the only thing to change, a firm relocation is an incident which illustrates the reaction of job holders to altered separation between home and workplace.

A firm relocating a significant distance is a truly exogenous and purely spatial shock to its employees (Fernandez, 1994; Holzer et al, 1997; Kasper, 1973). The journey to work is the only thing to change, as the workers and the jobs remain the same. Thus, the employees' response in terms of whether they leave, move house or commute to the new plant reflects the impact of the location of jobs on labour market outcomes more generally across a metropolitan area (Fernandez, 1994).

Zax and Kain (1996) studied the impact of a firm relocation on its workforce in terms of whether employees left their job or changed their residence in order to reduce their commute. They classified employees as either 'gainers' or 'losers' depending on whether their commute was shortened or lengthened by the relocation. They conceived that if the losers' quit rate increased around the time of the relocation, then this is evidence of constrained ability to commute which has a deleterious effect on their labour market position. The company is in the service sector and relocated in 1974 from the CBD of Detroit to the nearby suburb of Dearborn, a move of eight miles which takes 18 minutes by car. The authors used the firm's payroll records which included workers' addresses.

Zax and Kain (1996) present quit and move rates for two periods, one being two years prior to the relocation and the other being two years after the relocation (the employees were notified of the pending relocation two years prior to it taking place). These are summarised in the table 4.2.

Table 4.2 Zax and Kain's (1996) move and quit rates

Ethnic group	Pre-relocation period (1972-74)				Post-relocation period (1974-76)			
	Move Rate		Quit Rate		Move Rate		Quit Rate	
	Gainers	Losers	Gainers	Losers	Gainers	Losers	Gainers	Losers
Blacks	0.143	0.333	0.214	0.313	0.294	0.269	0.118	0.231
Whites	0.289	0.295	0.324	0.280	0.303	0.305	0.185	0.240

Note that the move plus quit rate for black losers over the four year period adds to more than 1.0. This is because a small proportion moved and then quit, and some moved more than once. Also note that the data only relate to employees who were with the firm since the start of the period of analysis.

Of particular significance are the considerably higher move and quit rates among black losers compared to black gainers. This is true in all cases except for post-relocation move rates. This shows that black people are constrained in how far they can commute (as over half the losers quit during the four year period compared to less than a third of gainers), but are able to move house in response to those constraints in considerable numbers (with 0.602 of losers moving over the four year period compared to 0.437 of gainers). However, the authors do not state or analyse the length, orientation or the impact on commuting distance of the residential moves.

White losers had a higher quit rate than white gainers after the relocation. Curiously, the converse was true of whites during the pre-relocation period. For black and white gainers and losers, quit rates were consistently higher before the relocation. This suggests that white workers responded to the impending relocation primarily before it took place. However, there was little difference between move rates before and after the relocation.

Zax and Kain (1996) proceed to calibrate econometric models which produce probit estimates of quit and move probabilities. In terms of likelihood of leaving employment, earnings have the most powerful impact, with the highest paid being the least likely to quit their job. The age of worker is the second most significant factor in explaining quit rates, with young workers being more likely to quit than older workers. Finally, the longer a worker has been with the firm, the less likely they are to quit. The tract unemployment rate of where employees live (as an inverse measure of the amount of

alternative job opportunities) is not significant in explaining quit probability. Overall, Zax and Kain estimate that 11.3% of black workers quit their job as a result of the relocation, although do not make a similar estimate for white workers.

In terms of the likelihood of moving house in response to the firm relocation, racial differences aside, age is the most powerful predictor of move probability, with the young being the most likely to move. The percentage of tract residents who commute by bus is the next most powerful, acting as a restraint on move probability, suggesting that those dependent on public transport are less likely to move house. The change in car commute time is the third most powerful predictor, with large increases in commute time increasing the probability of a move.

Fernandez (1994), in his firm relocation study in Milwaukee, argues that it is important to follow the fate of quitters, as Zax and Kain (1996) failed to do. It may be the case that they secure equally satisfactory, or preferable, employment and commutes after quitting, in which case the firm relocation has not had a deleterious impact on their position in the labour market (Fernandez, 1994).

Fernandez has embarked upon a 'before' and 'after' study of the workers of a food processing plant which relocated from the CBD of Milwaukee to the suburban ring. Unfortunately, only the 'before' element of this study has been completed to date. However, he plots the induced changes to different groups' commute burden and concludes that, *ceteris paribus*, women and ethnic minorities are the hardest hit.

4.4 Methodological design and hypothesis construction

Of the three natural spatial experiments - transport improvements, forced housing relocations and firm relocations - the latter is the most practicable in the Glasgow conurbation. The most recent significant transport improvement was phased in during the late 1970s when low level trains were introduced under the city centre, providing through east-west services. However, this is too long ago to be able to meaningfully trace the impact on the labour market. Forced housing relocations are still taking place due to an on-going demolition programme, but are now restricted to the most run-down

estates which are unlikely to have many residents in employment. In addition, most people displaced by demolition are now rehoused locally. However, firms are relocating on a regular basis within the conurbation.

It should be stressed that the driver of the increasing differential in job opportunities between the cores and rings of metropolitan areas is differential firm growth/birth and contraction/closure, rather than firm relocations, although the latter can be significant. Firm relocations are of interest not to assess their impact on metropolitan areas *per se*, but as a means to test the spatial mismatch hypothesis. The significance of the findings go beyond the impact of firm relocations in themselves, but also demonstrate the extent to which commuting, migration and job search/ recruitment are barriers to employment within the Glasgow conurbation more generally. This methodology will show what type of person, and in what proportions, is able to commute or migrate to new job openings in suburban locations. This is of relevance to new jobs, not just relocated jobs.

A localised natural spatial experiment, such as a firm relocation, takes a micro approach and a longitudinal view (i.e. it collects data relating to *particular individuals* and their behaviour *through time*). The firm relocation approach using data relating to individuals also allows qualitative methods to be brought to bear. This means that the manner in which individuals overcome different types of spatial barrier and their motives and decision-making processes can be assessed. Studies using cross-sectional data from secondary sources are unable to achieve this. The proportion of employees who commute to the new site, or sites, and the proportion who move house to shorten their commute who would not otherwise have done so can be examined in order to assess the significance of commuting and residential mobility as spatial barriers to employment. In addition, because the firm relocation approach uses micro level data, the extent to which these spatial barriers effect different groups of people can be accurately examined.

By asking the firms their reasons for relocating, it can also be established whether the skills profile of the workforce at each firm's original location influenced the firms' decisions to relocate within metropolitan areas. This needs to be tested for, since if this

was part of the reason for firms relocating, then this would mean that the skills mismatch perspective would in part explain the spatial shifts in the demand for labour.

This section now explains how the firm relocation methodology relates to each of the three research objectives of this study. Specific hypotheses to be tested are then developed. Note that each hypothesis has been worded in positive terms, so that its acceptance would imply support for the spatial mismatch hypothesis. To recap, the three specific research objectives of this work within the general aim of testing the spatial mismatch hypothesis in the British context are:

- 1) to establish whether there are commuting constraints within metropolitan areas which cause some people to become unemployed;
- 2) to establish whether there are constraints on residential mobility within metropolitan areas which prevent some people from migrating to be closer to suitable jobs; and
- 3) to establish if job search and/or recruitment processes present spatial barriers to employment within metropolitan areas.

The firm relocation methodology has been designed by Fernandez (1994) and Zax and Kain (1996) primarily in order to test the significance of commuting and migration as barriers to employment within metropolitan areas. However, the firm relocation methodology has been applied in this research in a manner which also brings evidence to bear on the importance of job search and recruitment as a spatial barrier to employment (although little can be differentiated between the relative importance of job search and recruitment). Therefore, the first and second of these three objectives are investigated by this research the most thoroughly, and the third in less detail. However, to separate the effects of commuting, migration and job search/recruitment is to investigate the nature of spatial barriers to employment within metropolitan areas in greater detail than previous spatial mismatch hypothesis studies.

It is hypothesised here that if quit rates increase because of firm relocations, then this is evidence of constraints on how far people can commute to certain types of jobs (*H1*).

However, people who leave their job may find alternative employment closer to home. Therefore, only if leavers subsequently tend to take inferior employment or tend not to re-enter employment would this be evidence that the spatial distribution of jobs influences the spatial pattern of unemployment and/or low pay within a metropolitan labour market (*H2*). If people are willing and able to move house to be closer to work in the face of commuting constraints, then this would remove the need for them to leave their job. Therefore, *H1* and *H2* not only provide a test of commuting constraints, but also provide evidence in relation to residential mobility is a barrier to employment.

Direct evidence of the extent to which commuting specifically is a barrier to employment is gathered in the tests of *H3* and *H4*. If people are constrained in how far they can commute, then workers with longer journeys to work will have greater quit rates (*H3*). Since some groups travel further to work than others, notably higher income groups, the *change* in a worker's commute induced by the relocation may be more significant in explaining their likelihood of leaving their job because of the journey to work (*H4*).

Thus, four related hypotheses are tested to assess the extent to which commuting is a barrier to employment within metropolitan areas:

H1: some staff leave their jobs because of the firm relocations

H2: those who leave due to the relocations tend to end up in a weaker economic position

H3: those who have, or would have had, the longest (shortest) commutes to the firms' new sites are more (less) likely to leave due to the relocations

H4: those who had, or would have had, their commutes lengthened (shortened) the most are more (less) likely to leave due to the relocations

Five further hypotheses have been designed to address the second research objective of establishing whether or not residential mobility is a barrier to employment within metropolitan areas. If people are unable to move house in order to overcome commuting constraints, then residential mobility rates will *not* rise in the period after the

firm relocations (*H5*)⁸. This would be evidence that proximity to work within a metropolitan area does not, or can not because of barriers to mobility faced by some groups, form a *push* factor in people's decision-making process as to whether or not to move house.

This finding would be reinforced if, more specifically, there was no relationship between the length of an individual's commute and their probability of moving house. Therefore, *H6* hypothesises that this relationship does not exist. As when testing for spatial relationships with leaving behaviour (*H1* to *H4*), since some groups travel further to work than others, the *change* in a worker's commute induced by the relocation may be more significant in explaining their likelihood of moving house (*H7*).

Thus, *H5*, *H6* and *H7* test whether proximity to work encourages people to move house at the outset, i.e. forms a 'push' factor in the migration decision. Hypotheses eight and nine (*H8* and *H9*), test whether or not people are able to take the opportunity of shortening their commute once they have made the decision to move from their current residence, i.e. whether proximity to work forms a 'pull' factor in the migration decision, in other words, influences the choice of destination.

If people with longer commutes are more likely to shorten their commute when they move house in any case, then this would show that proximity to work forms a pull factor in people's decision-making process regarding residential mobility within metropolitan areas. This would mean that, at least slowly, people could adjust their place of residence to the changing locations of suitable employment opportunities. In contrast, the spatial mismatch hypothesis would suggest that, certainly for certain groups, the option of shortening a long commute when they move house is *not* open to them. Therefore, *H8* hypothesises that this relationship does not exist. Once more, since some groups travel further to work than others, the *change* in commute induced by the firm relocations among those who move house for any reason could be expected to

⁸ Although this is a negative statement in grammatic terms, the wording used in hypotheses five to nine is that required that they be positive in methodological terms (i.e. consistent with the spatial mismatch hypothesis, which suggests that residential immobility is an obstacle to overcoming commuting constraints, in other words that some people are *unable* to move house closer to work).

be correlated with their likelihood of shortening their commute as a result (*H9*). As with hypothesis eight, the spatial mismatch hypothesis would suggest that the option of shortening their commute when people move house is *not* open to them. Therefore, *H9* hypothesises that there is no relationship between the change in commute induced by the firm relocations among those who move house for any reason and their likelihood of shortening their commute as a result of their move.

The five hypotheses to be tested in relation to the second research objective of this work are therefore:

H5: residential mobility rates do not rise as a result of the relocations ('push' factor)

H6: there is no relationship between the length of commute and the probability of moving house ('push' factor)

H7: there is no relationship between the amount that workers' commutes were altered by their employer's relocation and their likelihood of moving house ('push' factor)

H8: there is no relationship between the length of the initial commute of those who move house (for any reason), and their likelihood of shortening their commute as a result of moving house ('pull' factor)

H9: there is no relationship between the amount that the commutes of those who move house (for any reason) were altered by their employer's relocation and their likelihood of shortening their commute as a result of moving house ('pull' factor).

H5, H6 and H7 therefore test whether employment is a 'push' factor in people's decision to move house, whereas *H8* and *H9* test whether commute reduction is a 'pull' factor in people's choice of destination once they have made the decision to move somewhere.

Although not specifically designed by Fernandez (1994) and Zax and Kain (1996) to test for the significance of job search and recruitment as spatial barriers to employment, this study develops the firm relocation approach further by applying it to this question. This is done by comparing the post relocation recruitment pattern with the residences of

employees who worked at the previous site of a relocated firm, but who now commute to the new workplace. This can be explained as follows.

The commutes to the new site of employees who worked at the previous site represent how much travel burden workers are prepared to accept, as many of these workers had their journey to work lengthened, yet stayed with their employer. These commutes have been 'stretched' to the point where some of them have 'snapped'. Therefore, the commutes close to 'snapping' represent the maximum commute that is marginally viable for certain workers in certain jobs.

In contrast, the commutes of people recruited at the new site represent the spatial reach of job search and recruitment processes. If these 'new recruits' live closer to the employers' new sites than the existing workers, then it can be argued that the recruitment/job search process is a greater spatial constraint than travel, as these people could potentially travel further for the job they have just been recruited to. In contrast, if there was only the spatial friction of *travel* but no spatial barriers to job *search*, then we would expect an identical spatial separation between home and workplace of retained staff and new recruits. The difference between the commutes of retained staff and new recruits is thus an indication of the extent to which poor information and other costs restrict the spatial reach of job search and/or recruitment. If new recruits' commutes are 90% of the distance of the commutes of retained staff, then this suggests that job search and recruitment processes penetrate 90% of people's potential commuting catchments.

This logic again exploits the fact that the only thing to change at the time of the firm relocations is the employees' journeys to work. Not only do the retained staff already know about the jobs, but they actually hold a job before it relocates. Thus, job search and recruitment processes do not influence whether or not they stay in their job. New recruits, in contrast, have to go through the typical processes of searching for job vacancies, applying and being accepted by an employer.

To test the extent to which job search and recruitment practices penetrate potential commuting fields, the following hypothesis is tested:

H10: new recruits tend to live closer to the firms' new sites than retained staff

An advantage of being able to identify the travel to work pattern of new recruits is that they have not had time to adjust their place of residence to shorten their commute, or indeed lengthen it by moving house for reasons of residential amenity/quality.

Therefore, the new recruits' commuting pattern reflects the relationship between home and workplace for job *seekers*, rather than for all employees. This therefore reflects what is happening in the local labour market as it focuses exclusively on the process of matching job vacancies with job seekers.

4.4.1 Summary of hypotheses

Table 4.3 summarises the research objectives of this study and the hypothesis or hypotheses to be tested in order to investigate each objective.

4.5 Critique of the firm relocation approach

The firm relocation approach has seven main weaknesses. Before being explained in turn, they are listed here:

- 1) generalisability of results beyond the firms and employees in question;
- 2) some people who leave their jobs because of the relocations may have been enabled to do so because they have alternative employment opportunities available closer to home;
- 3) the results are sensitive to the economic cycle and the tightness of the overall local labour market in which a particular firm relocation study is carried out;
- 4) there may be attachment or commitment between employees and firms;
- 5) the nature of jobs may alter at the time of the relocation, for example due to changed production methods, thus diluting the validity of firm relocation as a spatial experiment;
- 6) there is interaction between the decision of an individual to leave their job because it relocates and to move house to be within commuting range; and

- 7) there are competing interpretations of why those recruited since the relocations may live closer to the firms' new sites than members of retained staff.

First, as section 4.3 explained in more detail with regard to natural spatial experiments generally, the principal weakness of the firm relocation approach is the generalisability of the results to the rest of the metropolitan area in question, and, indeed, to other metropolitan areas (Fernandez, 1993). This is the trade-off for obtaining micro data tracking individuals over time, using a methodology which, in theory, has a high degree of internal validity. A firm relocation only provides information on the impact on the employees of that firm, rather than assessing the overall significance of changing urban structure on all workers within a metropolitan area. The firm relocation methodology does not explicitly incorporate the deconcentration of employment in a particular metropolitan area into the analysis of spatial barriers to employment.

The firm relocation methodology is designed in order to investigate the extent and nature of spatial barriers to employment. Although this work assesses the differential impact of three spatial barriers to employment on different groups in terms of skills and other characteristics, it has not been designed to explicitly test the relative importance of spatial versus skills mismatches in a more generalisable sense within a whole metropolitan area.

A second weakness of the firm relocation approach is the fact that some workers who leave their job because their employer relocated, may be able to do so because they have alternative employment opportunities available closer to home. This is why it is important to gather information on the fate of people who leave their jobs because of their employer's relocation in terms of the distance they commute and the pay they receive in alternative employment they may secure (Fernandez, 1994). However, in their firm relocation study in the US, Zax and Kain (1996) did not find a significant relationship between quit probability and the unemployment rate in the tract in which an individual resides, suggesting that the amount of alternative employment opportunities available to people does not influence their likelihood of leaving their job.

Table 4.3 Research objectives and research hypotheses

Research objective	Hypothesis(es)
1) To establish whether there are commuting constraints within metropolitan areas which cause some people to become unemployed.	<p><i>H1: some staff leave their jobs because of the firm relocations</i></p> <p><i>H2: those who leave due to the relocations tend to end up in a weaker economic position</i></p> <p><i>H3: those who have, or would have had, the longest (shortest) commutes to the firms' new sites are more (less) likely to leave due to the relocations</i></p> <p><i>H4: those who had, or would have had, their commute lengthened (shortened) the most are more (less) likely to leave due to the relocations</i></p>
2) To establish whether there are constraints on residential mobility within metropolitan areas which prevent some people from migrating to be closer to suitable jobs.	<p><i>H5: residential mobility rates do not rise as a result of the relocations</i></p> <p><i>H6: there is no relationship between the length of commute and the probability of moving house</i></p> <p><i>H7: there is no relationship between the amount that workers' commutes were altered by their employer's relocation and their likelihood of moving house</i></p> <p><i>H8: there is no relationship between the length of the initial commute of those who move house (for any reason), and their likelihood of shortening their commute as a result of moving house.</i></p> <p><i>H9: there is no relationship between the amount that the commutes of those who move house (for any reason) were altered by their employer's relocation and their likelihood of shortening their commute as a result of moving house.</i></p>
3) To establish if job search and/or recruitment processes present spatial barriers to employment within metropolitan areas.	<p><i>H10: new recruits tend to live closer to the firms' new sites than retained staff</i></p>

A further defence of the firm relocation approach from this criticism, is the fact that if people leave their jobs because their commute is lengthened by their employer's relocation then this is evidence that the distance people can commute is limited. If a particular individual is able to secure alternative employment closer to home, then this may be their own good fortune based on where they live. However, given that, over metropolitan areas as a whole, the rate of employment deconcentration has been greater than that of population over recent decades, if people are faced with commuting constraints, as suggested by an enhanced quit rate due to a firm's relocation, then this will result in rising unemployment in the metropolitan core. Thus, the firm relocation methodology rests on the spatial mismatch hypothesis assumption, as do the comparison of commuting times and earnings methodologies, that employment deconcentration has been greater than population deconcentration within metropolitan areas.

A third weakness with the firm relocation methodology is that the results may be sensitive to different stages in the economic cycle (Fernandez, 1993). Clearly in times of recession, workers will be less inclined to quit their job as there will be fewer alternative opportunities. This means that the methodology might produce different results when performed at different points in the economic cycle, or when performed in different locations with different overall levels of unemployment. People may be more inclined to endure difficult commutes when their employer relocates within a slack local labour market with less alternative employment opportunities. However, those who do leave in the context of a slack local labour market may be less likely to immediately find alternative employment.

A fourth weakness of the firm relocation approach is that there may be attachment and commitment between employees and firms. Employers may wish to retain a certain proportion of staff and certain key senior personnel over the period of the relocation in order to ensure the continued smooth running of the firm. To achieve this, employers may offer financial or other incentives, such as perks or promotion. Similarly, people may be keen to remain with an employer they are satisfied with rather than risk changing jobs and being less happy with a new firm. Additionally, employees may feel a degree of attachment and loyalty to their employer, and be willing to support them in

their move. Thus, workers may accept longer post-relocation commutes than they would accept if they were searching for a new job. In other words, it may take a longer commute to dislodge someone from their job than it does to dissuade them from accepting an offer of a new job. Counter to this though, is the fact that some people may consider their employer relocating too great an upheaval, and take the opportunity to change jobs. These factors must be borne in mind when applying the findings from specific firm relocations to the general operation of local labour markets.

The fifth weakness of the firm relocation methodology is that the assumption that the journey to work is the only thing to change may not always be true. Production methods or management practices, for example, may change when the new plant or office is opened. This in itself may cause some employees to leave due to their skills being redundant or due to an aversion to change. This could potentially be pertinent if workers leave because they lack the skills to perform their new jobs, as it would be skills mismatch rather than spatial mismatch causing people to leave their relocated jobs. However, the extent of changes to jobs can be investigated with individual firms.

The sixth weakness of the firm relocation approach is interaction between individuals' choices of whether to leave their job or move house to be within commuting range of their job's new location. Quitting and moving are substitutes for one another; to do one removes the need to do the other (Zax, 1991b). It has been hypothesised in the development of the research methodology for this work that people will not move closer to work as a result of the firm relocations. This will be interpreted as meaning that people face barriers to moving closer to work, as the spatial mismatch hypothesis suggests. However, an alternative interpretation of this would be that people have no need to move house to be closer to work within the Glasgow conurbation because they have no problem commuting the distances required to access all jobs in the Glasgow conurbation. Indeed, if commuting is shown to be a barrier to employment by the firm relocation methodology, then, *a priori*, residential mobility must also be a barrier to employment, because if people faced commuting constraints but were able to overcome those constraints by moving house to be closer to work, then we would not witness

people leaving their jobs when they relocate and taking up inferior alternative employment.

The seventh weakness of the firm relocation methodology is some ambiguity in the interpretation of hypothesis ten (that new recruits live closer to the firms' new sites than members of retained staff because job search and recruitment are greater spatial barriers to employment than commuting alone). This analysis does not differentiate between job search behaviour and employers' recruitment behaviour. It may be the case that information about job vacancies becomes less readily available the further one moves from the location of the job or, alternatively, it may be the case that job seekers do not have the means to find out about more distant job vacancies, for example due to travel costs or localised geographical perspectives. Furthermore, job seekers may apply for distant jobs but they are not hired due to employers preferring to employ local people. However, qualitative interviews with managers of firms and recently recruited employees can shed some light on this.

An alternative interpretation of hypothesis ten is that new recruits may live closer to the firms because of 'intervening opportunities'; in other words, they may have a choice of whether they work close to home or further afield and rationally choose the former. Detailed information on the location of jobs applied for by individuals would need to be collected to unequivocally answer this question. However, in a situation of labour surplus in most of the ring of the Glasgow conurbation as well as in the core, it is unlikely that job seekers, particularly those looking for blue-collar work, are faced with an abundance of jobs to choose from. Similarly, information on the residential addresses of applicants to a firm could be usefully compared against the pattern of those offered employment. However, in order to differentiate between the behaviour of employers and the behaviour of job seekers, these data would need to show the spatial pattern of applicants, those who were offered a job and those who accepted a job. Similarly, data relating to job seekers would need to show the spatial pattern of jobs identified, those applied for, those offered and those accepted.

This, however, would go beyond the scope of this research which primarily seeks to test the spatial mismatch hypothesis and gather information on the relative importance of commuting, migration and job search/recruitment processes, without investigating the precise mechanisms of the latter. What is interesting about the latter group of spatial barriers to employment is that they depend on the behaviour of job seekers and employers and the information structures which exist between them. This is in contrast to the nature of commuting and migration barriers which are to a greater extent dependent on the physical form and size of metropolitan areas. The firm relocation methodology therefore investigates the significance of commuting and migration as barriers to employment within metropolitan areas in greater detail than job search/recruitment.

4.6 Non-spatial influences on propensity to leave employment or move house

The impact of firm relocations on people's journey to work is not the only reason people leave jobs. People leave jobs for a variety of reasons, for example better pay or conditions elsewhere. How important is the journey to work in comparison to other factors in the wider local labour market?

If the journey to work features in people's overall employment choices, then this would add to the generalisability of the results of this work beyond the people immediately affected by the firm relocations to the wider local labour market. Therefore, it would be desirable to collect information on workers' reasons for leaving their jobs. If this information was available, it could also confirm that the individuals leaving their jobs included in the testing of the above hypotheses were indeed leaving because of the journey to work, rather than relying on observing the aggregate number of people who leave their jobs changing over the period of a firm relocation, and assuming that the excess over the 'normal' is due to the relocation. Former employees can also be asked if they would have left their job had their former employer not relocated.

Similarly, the journey to work is not the only reason people move house. How important is the journey to work in comparison to other factors in the wider local housing market? As with the reasons for people leaving their jobs, it is important to

assess the relative importance of the journey to work in comparison to other factors for the people who move house in a firm relocation study. This will increase the level of generalisability to the operation of the wider local housing market. It would be valuable to be able to ask individuals themselves if they would have moved house had their employer not relocated.

4.7 The characteristics of 'leavers' and 'movers'

Some groups of people have been shown by previous research to work closer to home than others. Therefore, we would expect these groups to have greater propensities to leave their jobs because of the journey to work when their employers relocate. As outlined in chapter three, the groups that have been shown to commute less include: manual and lower-skilled workers (McLafferty and Preston, 1997), lower income groups (Gabriel and Rosenthal, 1996), women (Madden, 1981), and those who travel by public transport (Shen, 1998).

Thus, workers' characteristics need to be controlled for when assessing the impact of firm relocations. For this reason, multi-variate analysis needs to be carried out in order to assess the importance of firm relocations in comparison to the importance of people's characteristics in determining people's propensity to leave their job because of the journey to work. This analysis would also provide information on which groups of people are most susceptible to commuting as a barrier to employment within the Glasgow conurbation.

Similarly, with respect to people who move house, some groups of people, particularly young people, are more likely to move house in general than others. In addition, people living in social housing also tend to have low residential mobility rates, certainly between local authority areas. More importantly with respect to the firm relocation methodology, some groups of people may be more inclined to move house specifically to be closer to work. Therefore, as with the analysis of people's propensity to leave their job because of the journey to work, multi-variate analysis needs to be carried out in order to assess the importance of firm relocations in comparison to the importance of

people's characteristics in determining people's propensity to move house closer to work.

4.8 Testing the spatial mismatch hypothesis in the Glasgow conurbation

This research tests the spatial mismatch hypothesis in the Glasgow conurbation using evidence from firm relocations. This section justifies the suitability of the Glasgow conurbation as a setting to test the spatial mismatch hypothesis. In so doing, it provides empirical background to the spatial aspects of the labour market and urban structure of the conurbation, in order to contextualise the results of the primary data collection exercise carried out to address the three research objectives of this study.

As explained in section 4.3, the firm relocation methodology is not dependent on any particular spatial setting in terms of the spatial distribution of unemployment or the changing spatial distribution of employment opportunities in order to test the nature and extent of commuting, residential mobility and job search/recruitment as spatial barriers to employment. However, if the significance of these barriers is to be related to the spatial mismatch hypothesis in particular, then these aspects of urban structure need to be considered. In this respect, the Glasgow conurbation should comply with the key assumptions of the spatial mismatch hypothesis in order for the general findings regarding spatial barriers to employment faced by individuals to be consistent with the spatial mismatch explanation of the spatial distribution of unemployment within the conurbation.

The previous chapter identified two key assumptions of the spatial mismatch hypothesis which need to be shown to hold true in the Glasgow conurbation for the hypothesis to potentially apply. The firm relocation research carried out here tests whether there are spatial barriers to employment within the Glasgow conurbation. If these two assumptions are valid in the Glasgow conurbation, and spatial barriers to employment are shown to exist, then it can be concluded that spatial mismatch contributes to the observed spatial pattern of unemployment within the Glasgow conurbation.

The two key assumptions of the spatial mismatch hypothesis about the characteristics of metropolitan areas which need to be shown to hold true in the Glasgow conurbation are:

- 1) that employment deconcentration over recent decades has been greater than that of population, suggesting that there is indeed 'spatial mismatch' on the ground; and
- 2) that the conurbation has higher unemployment rates in its core than in its ring.

This section will show that both these hold true in the Glasgow conurbation, building upon data presented in sections 2.3 and 2.4 in chapter two. In addition, four further characteristics of the urban structure of the Glasgow conurbation make it likely that spatial barriers to employment offer a partial explanation of the spatial distribution of unemployment within the conurbation. These are:

- 3) social housing and other housing for lower income and lower-skilled groups, whose transport and residential mobility is low, is over represented in its core;
- 4) car ownership rates are lower in the core than the ring;
- 5) its geographical size; and
- 6) the slackness of the overall metropolitan labour market.

Two further factors point towards the salience of testing the spatial mismatch hypothesis in the Glasgow conurbation:

- 7) the spatial patterns of employment change and unemployment rates are similar to those in other British metropolitan areas (Turok and Edge, 1999), giving the results a degree of generalisability to other metropolitan areas in Britain; and
- 8) the decline of employment opportunities and the concentration of unemployment and its associated social and environmental problems within the Glasgow conurbation are of strong concern among policy makers.

These eight aspects of the Glasgow conurbation are now illustrated and discussed in the remainder of this chapter. The spatial definition of the conurbation used is the same as that used by Turok and Edge (1999) and the sponsor of this research, Glasgow City

Council. This definition has as the core of the conurbation Glasgow City, plus ten surrounding pre-1996 local authority districts⁹, corresponding closely to the contiguous built-up area.

4.8.1 Employment and population deconcentration

Section 2.4 in chapter two showed the extent of employment deconcentration in the Glasgow conurbation. This section outlines the extent of labour market adjustment to employment decline in the core of the conurbation.

The labour market 'accounts' in table 4.4 show people's responses to job loss in Glasgow City over the period 1981-91¹⁰. Net out-migration of men from Glasgow amounts to nearly three-quarters of the loss of jobs held by men in the case of Glasgow City (although this migration figure includes net natural change which is likely to be positive). This confirms that the deconcentration of male employment has exceeded that of male population over this period.

As with the labour market accounts presented in chapter three for all eight British metropolitan cores, the fall in male unemployment in Glasgow is more than offset by the rise in economic inactivity. Male net out-commuting from Glasgow has increased slightly, reflecting the deconcentration of employment opportunities. This masks the increase in gross out-commuting from Glasgow, as gross in-commuting has also increased due to the suburbanisation of population still employed in professional, managerial and other white collar service sector jobs in Glasgow city centre (Glasgow City Council, 1996).

As with the eight metropolitan cores as a whole (shown in chapter three), female labour market accounts are quite different. Net female out-migration from Glasgow City actually marginally exceeds the decline in 'female' jobs. This is likely to be in part because of whole households migrating in response to male job losses. However, bear

⁹ Bearsden & Milngavie, Clydebank, Cumbernauld & Kilsyth, East Kilbride, Eastwood, Hamilton, Monklands, Motherwell, Renfrew, and Strathkelvin.

in mind that this figure includes natural change, which is likely to be positive, therefore population change due to migration may have been similar or slightly lower in percentage terms to the change in jobs located in Glasgow City held by women. Female net commuting from Glasgow City has, in contrast to male, declined. The female economic activity rate in Glasgow City, in contrast to increases nationally, *fell* by 4.8 percentage points between 1981 and 1991, reflecting the scale of employment decline and deconcentration in the City.

Table 4.4 Labour market accounts, Glasgow City, 1981-91

		Glasgow City <i>% of 1981 working age population economically active</i>	
		Male	Female
	Job Loss	21.8	11.6
MINUS	Net out-migration*	16.1	12.9
MINUS	Change in net out-commuting	0.9	-5.4
MINUS	Rise in economic inactivity	9.5	4.8
MINUS	Rise in number on gov. schemes	2.4	1.4
EQUALS	Change in unemployment	-7.1	-2.1

**Natural increase in workforce is not available for Scottish districts, therefore the migration figure includes the total demographic contribution, i.e. net out-migration less natural increase.*

Source: Turok and Edge (1999) using Census of Population and Census Special Workplace Statistics.

Map 4.1 shows the change between 1981 and 1991 in employment opportunities within the eleven districts comprising the Glasgow conurbation¹¹. The number of jobs in Glasgow City fell by 16.8%, from 362,310 to 301,610. Five other districts also experienced declines in their number of jobs, although the absolute numbers in the other districts are substantially smaller than those for Glasgow. Indeed, the total decline in absolute terms in the other five declining districts combined totals 39,230, substantially less than the decline in Glasgow City of 60,700.

¹⁰ As the most recent Census of Population years for which data are available, these years allow accurate changes in population to be assessed, and figures to be presented in relation to changes in commuting patterns, using the Census of Population Special Workplace Statistics.

¹¹ The 1981 Census Special Workplace Statistics for Scotland are not available in a form consistent with digital boundary data below district level, otherwise this map would have been produced at a finer geography. Census years were used for this analysis in order to be consistent with other maps in this section which present other data from the 1991 Census at postcode sector level. Although not exactly at comparable points in the national economic cycle (see section 2.4 in chapter two), both 1981 and 1991 are on the 'downswing'.

The spatial pattern of employment change in the conurbation is interesting. It does not obviously conform to a core/ring model in the literal sense of a central core in decline surrounded by a contiguous ring. The districts in addition to Glasgow City with substantial employment decline – Renfrew, Strathkelvin, Monklands and Motherwell – share with Glasgow a common industrial legacy of heavy engineering. In this sense, these districts can be thought of as forming the economic ‘core’, elongated along the east-west axis, influenced by the course of the River Clyde, close to which much of this heavy engineering was located.

Cumbernauld & Kilsyth district experienced strong employment growth of 15.6% between 1981 and 1991, from 15,530 to 17,960. This can largely be accounted for by the location of Cumbernauld New Town which has seen the development of many industrial estates throughout this period. Similarly, the district of East Kilbride, which also contains a New Town of the same name as the district, enjoyed employment growth between these years, although at 5.4% (from 29,340 to 30,920), this was more modest than in Cumbernauld & Kilsyth.

However, unemployment, particularly long-term unemployment, is disproportionately borne by the unskilled. Map 4.2 shows the change in the spatial distribution of unskilled employment opportunities. The demand for unskilled labour in Glasgow City fell by 31.5% in this ten year period, from 47,400 to 32,460. This is the greatest proportionate fall of all the eleven districts in the conurbation, although the districts comprising the declining economic ‘core’ identified in the pattern of total employment change previously, also suffered substantial percentage reductions in the number of unskilled employment opportunities. However, as with total employment change, the combined decline in these districts in absolute terms is substantially less than the decline in Glasgow City.

4.8.2 Spatial distribution of unemployment

Unemployment is a problem across the Glasgow conurbation, but is generally heavily concentrated towards the core, as shown in map 4.3. The darkest areas, representing postcode sectors with ILO unemployment rates above 30%, are most prevalent in the

north and east of Glasgow City, including Easterhouse, one of the City's four peripheral public housing estates built in the 1960s. Two of the other three peripheral estates can also be identified as having unemployment rates in excess of 30% - the Drumchapel estate in the far north-west of Glasgow City, and the Castlemilk estate in the south. However, there are a number of pockets of low unemployment within Glasgow City with rates below 10%, mainly to the north of the river west of the city centre, and in the south of the City away from the River Clyde.

Within the conurbation as a whole, the lowest unemployment rates below 10% tend to be found in the outermost postcode sectors to the south, west and north of Glasgow City. These areas are more affluent suburbs and the two New Towns. To the east of Glasgow City, where the industrial towns of Lanarkshire are located, unemployment rates all lie between 10% and 20%. Unemployment rates are slightly higher in the town of Paisley in Renfrew district than the surrounding area. Paisley lies on the White Cart Water which can be seen flowing north into the Clyde.

Overall, in 1991 Glasgow had an ILO unemployment rate of 19.4% compared to 11.2%¹² for the rest of the conurbation, a ratio of 1.7. This differential has diminished as unemployment rates have fallen throughout the 1990s, but the overall pattern persists, with the 2000 ILO unemployment rate in the City being 10.5% compared to 7.4%¹³ in the ring of the conurbation, a ratio of 1.4. This general pattern, and the deconcentration of employment shown previously and in chapter two, are consistent with 'spatial mismatch' contributing to the spatial pattern of unemployment found within the Glasgow conurbation, therefore the conurbation is a candidate for 'spatial mismatch' unemployment.

4.8.3 Segregation of immobile groups

Residential mobility within a metropolitan area is important in the spatial mismatch hypothesis. The City of Glasgow's housing stock is dominated by social rented housing and former public sector housing (many council properties transferred to the owner

¹² Source: 1991 Census of Population

¹³ Source: Labour Force Survey

occupied sector because of the Right-to-Buy legislation). Note that although it has been shown that in Britain tenants in the social rented sector have lower residential mobility than owner occupiers, at least at the inter-regional scale, low income groups and members of lower-skilled occupational groups in all housing tenures display low residential mobility rates (Burridge and Gordon, 1981). In addition, lower income and lower-skilled groups have been shown to live closer to work (McLafferty and Preston, 1997).

Map 4.4 shows the proportion of households in social rented accommodation across the conurbation. The geographical pattern of social renting in the conurbation is closely associated with that of unemployment shown in map 4.3. Many postcode sectors in the north and east of Glasgow City have more than 80% of their households living in the social rented sector. The peripheral estates identified on map 4.3 as having high unemployment rates also have high levels of social renting. Much of Lanarkshire north of the River Clyde has 60-80% of households in the social rented sector.

Overall, 57% of households in Glasgow City live in the social rented sector, and 45% of those in the rest of the conurbation. Therefore, those in the least mobile housing tenure also tend to live in the areas worst affected by employment decline, as illustrated in maps 4.1 and 4.2.

Similarly, lower-skilled groups, who have also been shown to have low transport and residential mobility, are also generally disproportionately found towards the core of the Glasgow conurbation. This group is also significant since its members are at particular risk of unemployment, especially long-term unemployment (Gordon, 2002). The spatial distribution of this group is shown in map 4.5 as a percentage of all economically active households headed by a person in, or formerly in, an unskilled occupation.

The pattern in map 4.5 is perhaps slightly less striking than that of unemployment and social housing, although the concentrations of unskilled headed households are disproportionately located once again in the north and east of Glasgow City. North Lanarkshire stands out less than in previous maps, with the majority of the postcode

sectors in this area in the range of 5-10% of economically active households headed by an unskilled person. Overall, 7.3% of economically active households in Glasgow City are headed by an unskilled person, compared to 5.1% in the rest of the conurbation.

4.8.4 Low car ownership in the core of the conurbation

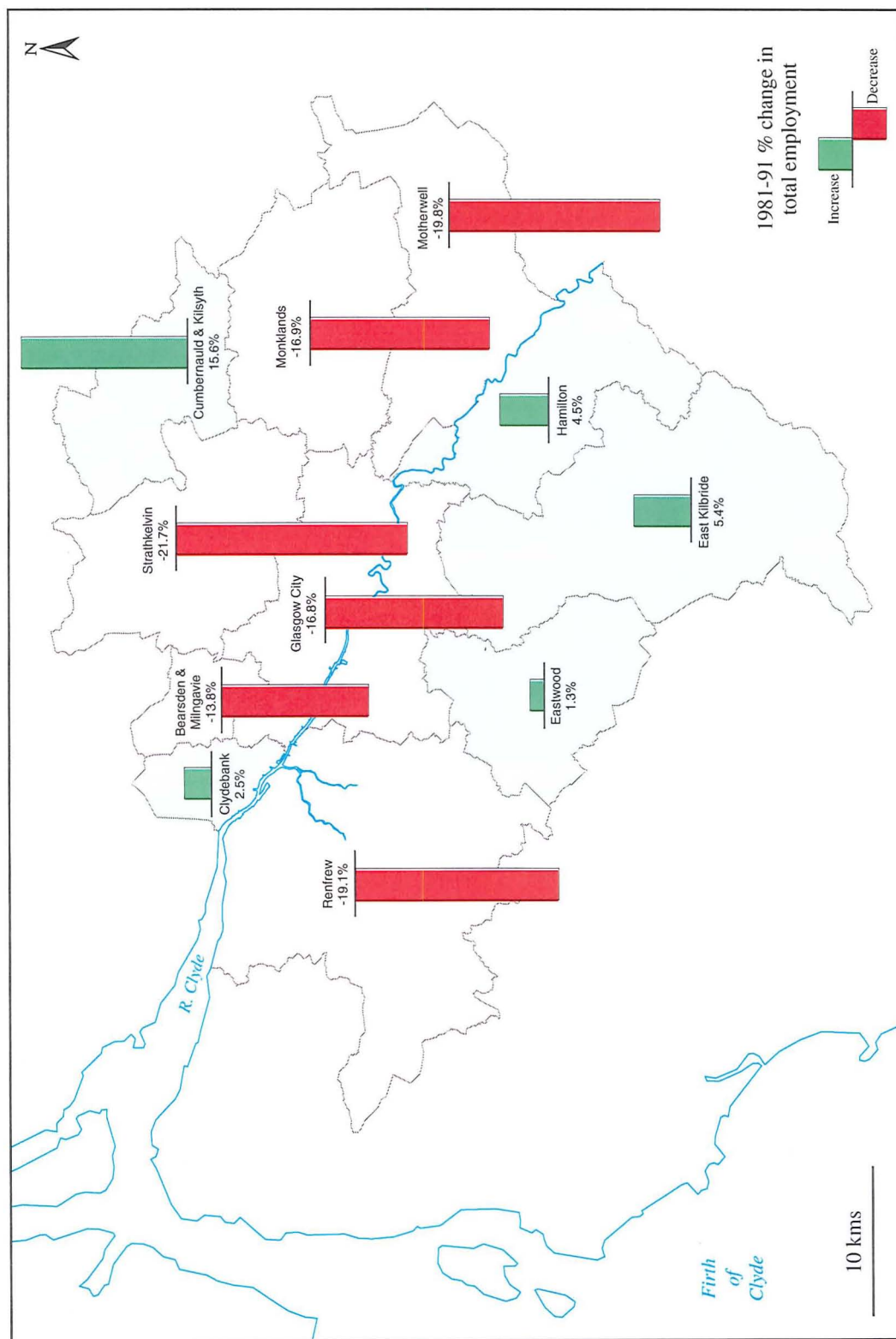
Limited access to private motorised transport in the inner part of the conurbation may compound the effects of spatial mismatch on the employment prospects of many Glasgow residents. Map 4.6 shows the percentage of households without access to a car across the conurbation.

There is a particularly strong concentration of postcode sectors with more than 75% of households without a car within Glasgow City. However, Glasgow residents benefit from living closer to the city centre and are likely to enjoy denser provision of public transport services, therefore have less need of a car. Car ownership is likely to be related to poverty, and once again the postcode sectors of the north and east of the City have low levels of car ownership.

Outwith Glasgow, the areas in the outer ring of the conurbation to the south and east have particularly high levels of car ownership. As well as reflecting and reinforcing labour market advantage in these areas, this may also be a result of the lower density and less accessible nature of these more outlying areas. The areas east and north-east of Glasgow City tend to have low levels of car ownership, with the majority of postcode sectors having between 45% and 60% of households with no car.

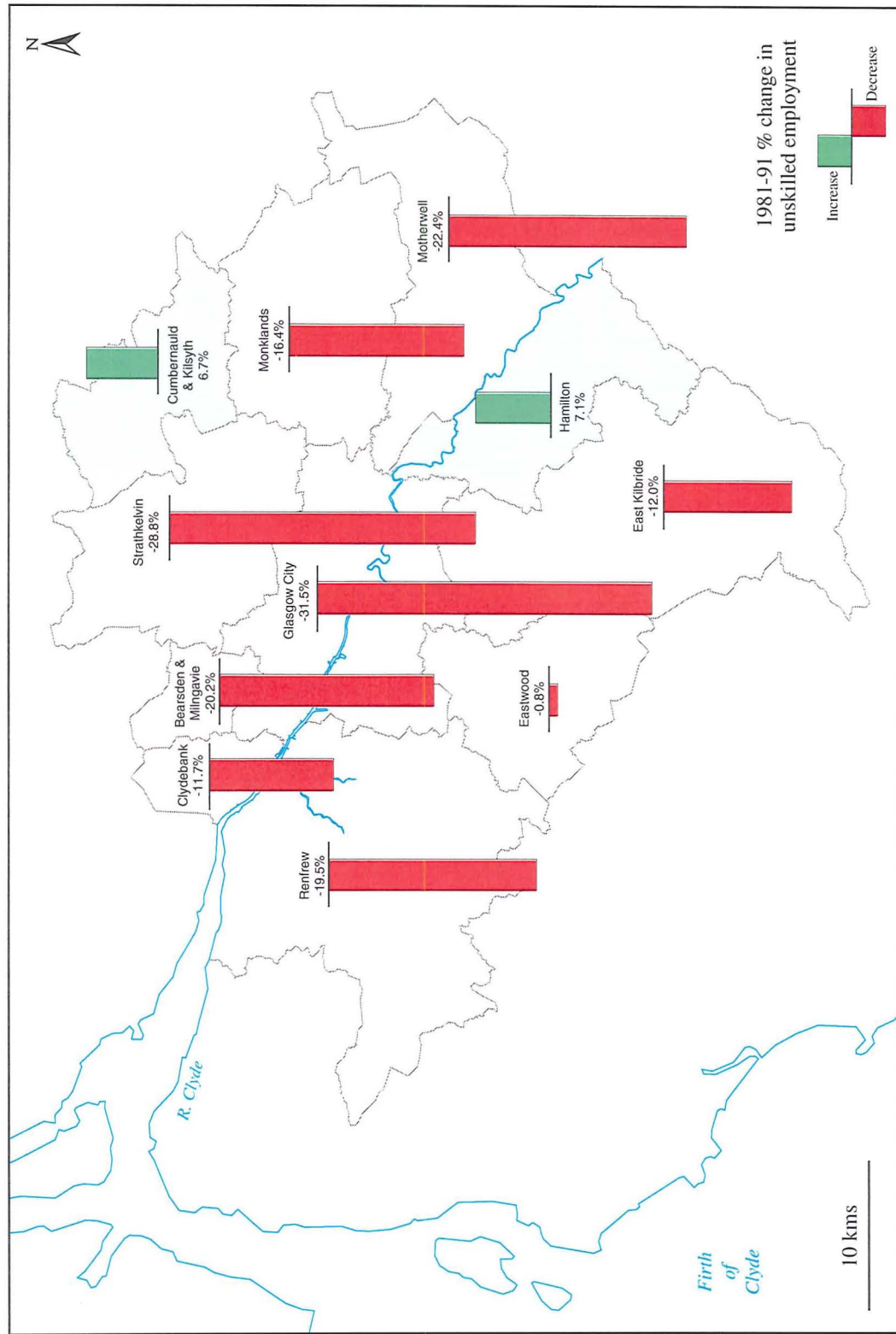
Overall, 66% of households in Glasgow City have no car, compared to 42% in the rest of the conurbation. Unemployment and low earnings will, *a priori*, make car ownership less affordable, but, equally, the absence of a car may make decentralised employment opportunities less accessible. Thus, unemployment and low car ownership are likely to reinforce each other.

Map 4.1 1981-91 change in spatial distribution of jobs, Glasgow conurbation



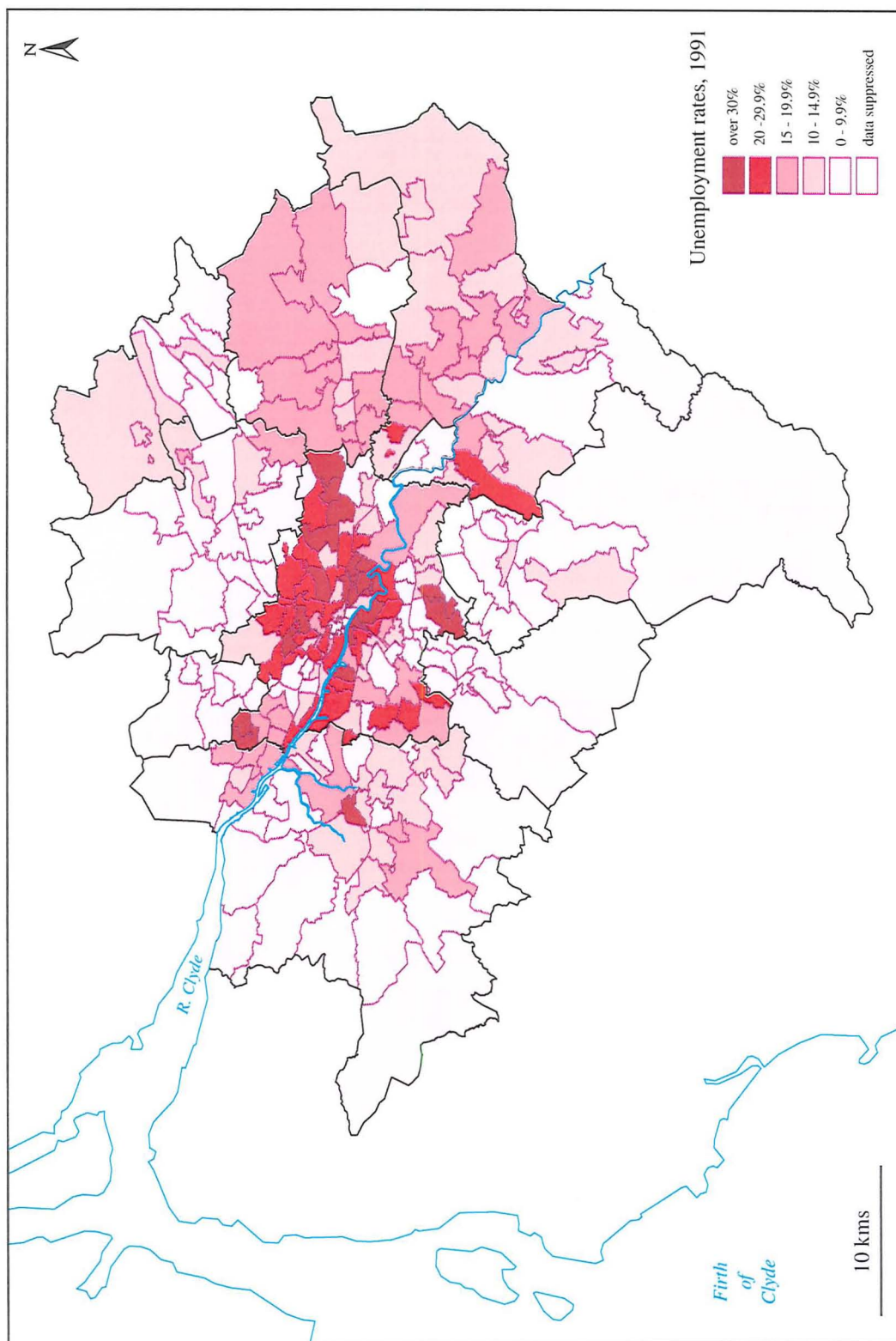
Source: 1991 Census of Population

Map 4.2 1981-91 change in spatial distribution of unskilled jobs, Glasgow conurbation



Source: 1991 Census of Population

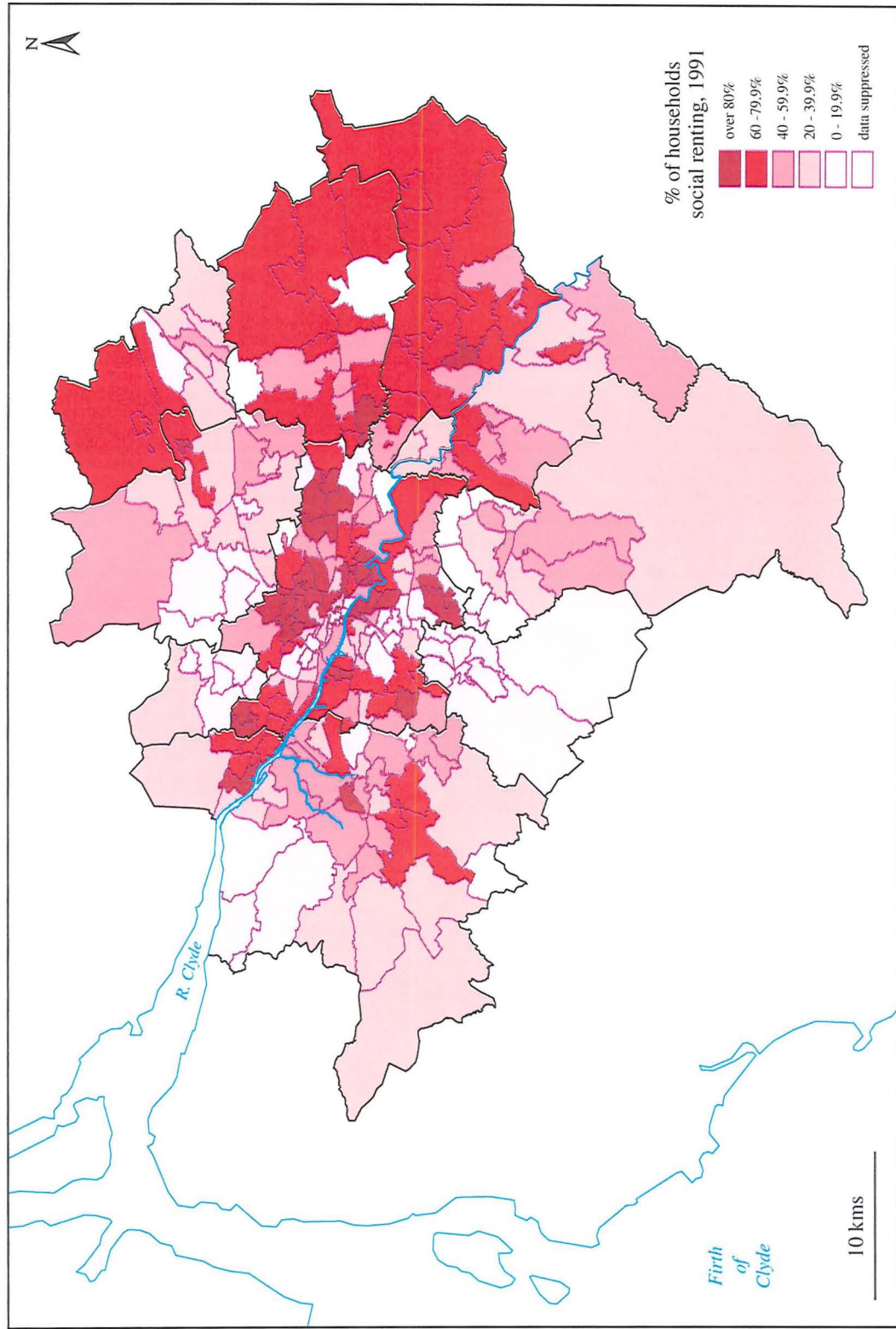
Map 4.3 1991 spatial distribution of unemployment rates, Glasgow conurbation



Source: 1991 Census of Population

Note: The data for some postcode sectors which contain few residential addresses are suppressed to protect the anonymity of residents

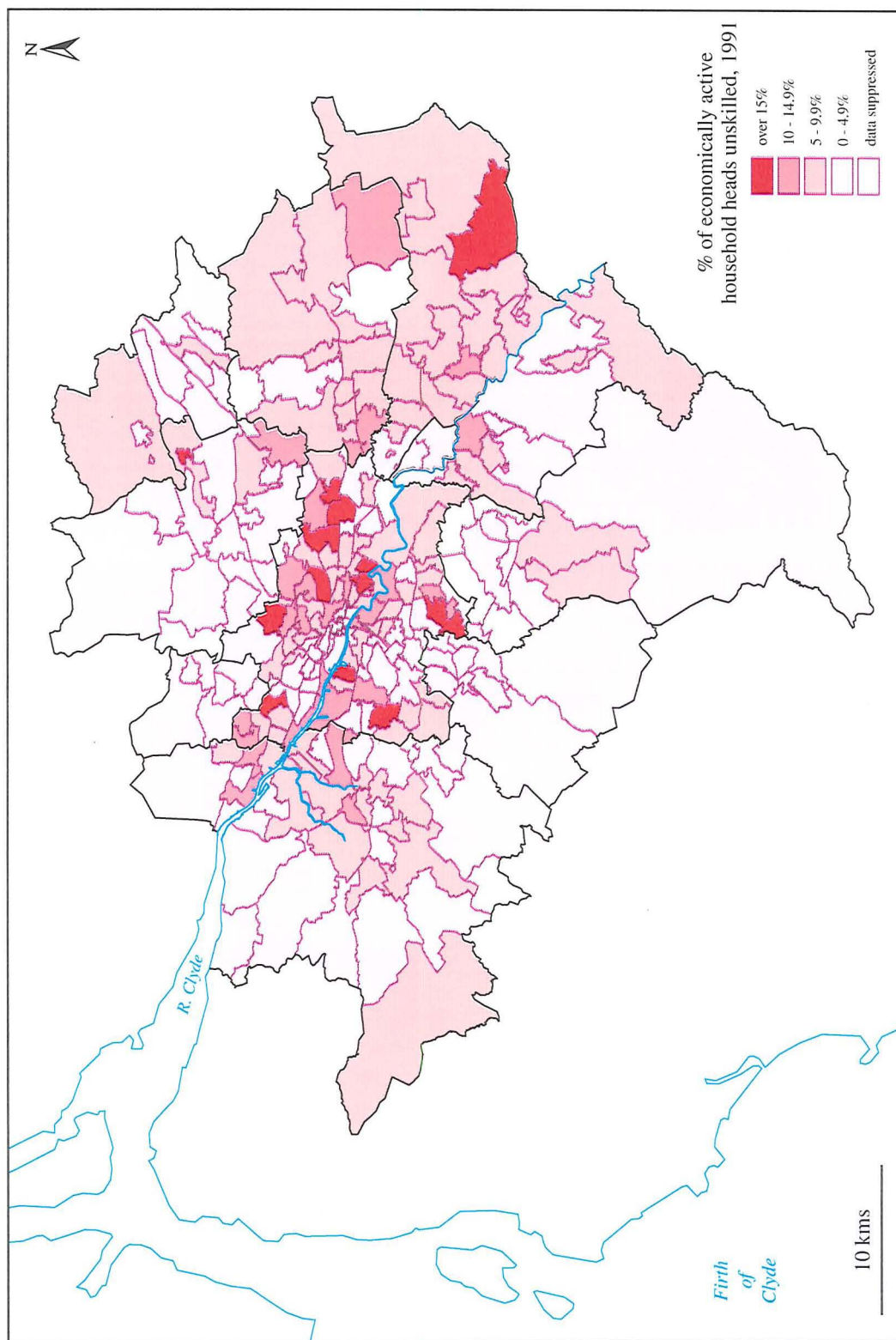
Map 4.4 1991 spatial distribution of social renters, Glasgow conurbation



Source: 1991 Census of Population

Note: The data for some postcode sectors which contain few residential addresses are suppressed to protect the anonymity of residents

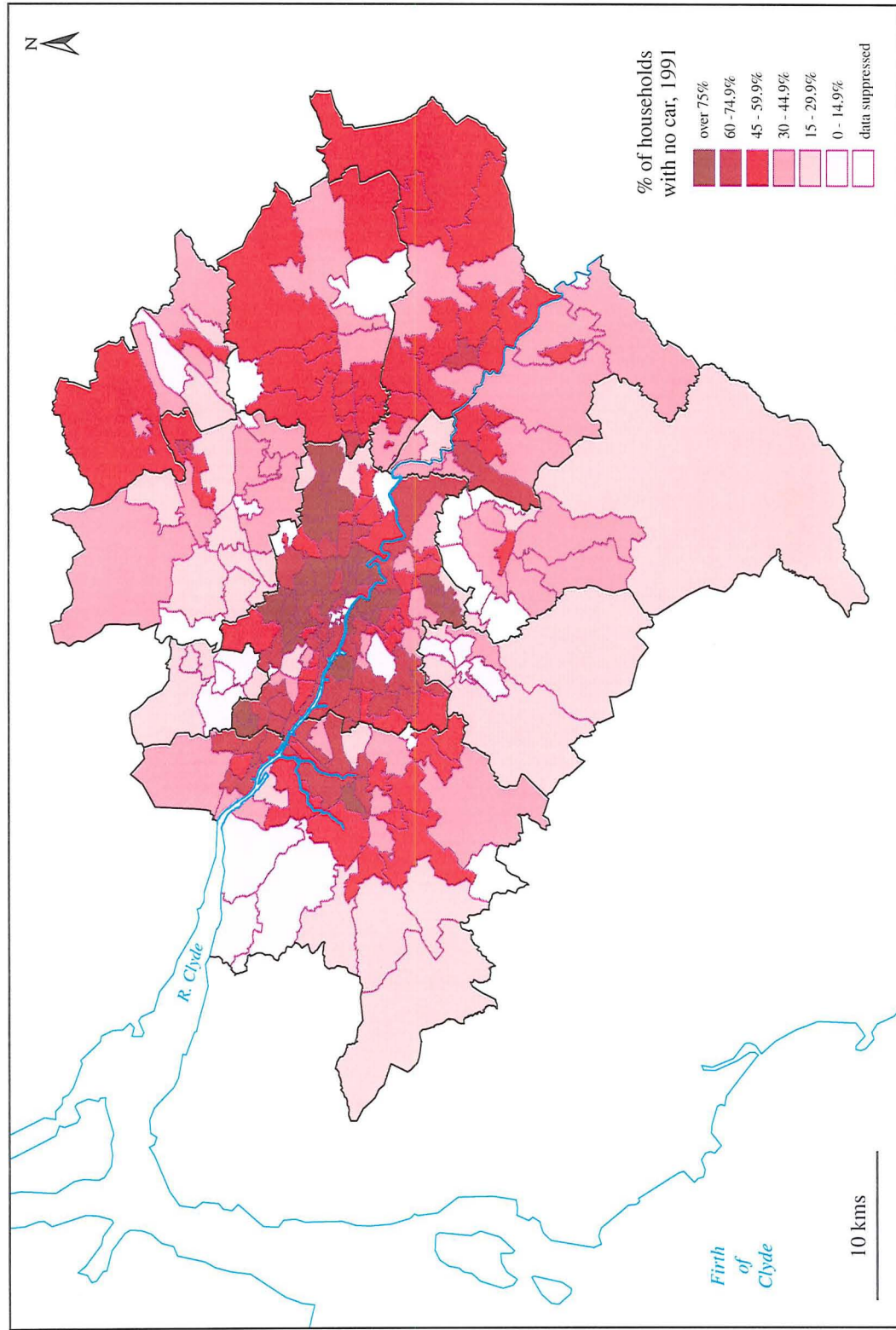
Map 4.5 1991 spatial distribution of unskilled headed economically active households, Glasgow conurbation



Source: 1991 Census of Population

Note: The data for some postcode sectors which contain few residential addresses are suppressed to protect the anonymity of residents

Map 4.6 1991 spatial distribution of households without a car, Glasgow conurbation



Source: 1991 Census of Population

Note: The data for some postcode sectors which contain few residential addresses are suppressed to protect the anonymity of residents

4.8.5 Geographical size

The geographical size of the Glasgow conurbation is such that it may potentially be difficult to commute from one side of the conurbation to the other. However, the transport infrastructure makes some locations within the conurbation more accessible than others.

The built-up area surrounding the City of Glasgow covers an area stretching approximately 50 km east to west and 30 km north to south at its widest points. This is slightly larger in terms of physical area than most of the other metropolitan areas, even those which have larger populations, for example Greater Manchester and the West Midlands conurbation.

The M8 motorway runs from Greenock 45km to the west of Glasgow to Edinburgh 70km to the east, providing good road access to Glasgow city centre. The river Clyde is crossed by the M8 over the Kingston Bridge by the city centre, the Clyde Tunnel just west of the city centre, the A82 over the Erskine Bridge to the west of Glasgow, and several road and rail crossings further east where the river is narrower.

The M77 runs south-west from the city to Ayrshire, while the M74 provides access to the south. The conurbation is well served by a local rail network providing passenger services. While the transport network is not particularly under-developed, congestion is experienced in many parts of the conurbation during peak commuting periods. Glasgow city centre lies to the north of the river Clyde, and is served by an underground system which operates in a circuit, passing beneath the river Clyde to stops south of the river, many with 'park-and-ride' facilities.

Many of the industrial estates in the outer conurbation are not directly linked to the motorway or passenger rail networks. This, coupled with the not insubstantial size of the conurbation, make the Glasgow conurbation a potential candidate for a 'spatial mismatch' unemployment problem.

4.8.6 Slackness of the metropolitan labour market

The Glasgow conurbation as a whole in 2000 had an ILO unemployment rate among people of working age of 8.4%, compared to 7.2% for all the eight British metropolitan areas, and 5.6% for Britain as a whole. Therefore, the conurbation as a whole has a fairly slack labour market, although not substantially slacker than all the metropolitan areas as a whole. As noted previously, this is 10.5% in Glasgow City and 7.4% in the rest of the conurbation.

Despite the differential between core and ring, this shows there to be surplus labour in the ring as well as in Glasgow City. Therefore, according to urban economic theory, employers in the ring do not need to offer higher wages to persuade people to commute from the core of the conurbation. In other words, Glasgow residents may not be 'compensated' by higher wages in the ring to enable them to overcome commuting constraints. In addition, owing to the surplus labour in the ring as well as in the core, employers can, if they so wish, specifically seek to hire local people, at least for lower-skilled positions.

4.8.7 Representativeness of other British metropolitan areas

It is desirable to carry out the empirical work for this thesis in a metropolitan area which is broadly representative of the other metropolitan areas in Britain. This will allow the findings to be more broadly generalisable than might otherwise be the case.

Each of the eight largest metropolitan areas in Britain are, however, to a greater or lesser extent, unique. This is likely to be true in terms of a number of factors, for example the detailed pattern of unemployment rates, the slackness of the local labour market, the degree of residential segregation of socio-economic groups, the extent of employment and population deconcentration, car ownership rates, and the relative importance of different housing tenures in each metropolitan area. In addition, the physical size, density, land use pattern and transportation infrastructure is particular to each metropolitan area.

Space here does not permit a detailed comparison of these factors in the eight metropolitan areas of Great Britain, beyond that presented in sections 2.3 and 2.4 of chapter two. This showed that the Glasgow conurbation is close to the average for the eight metropolitan areas on a number of relevant indicators, notably the ratio of the core to ring unemployment rates, and the extent of employment deconcentration. In addition, the labour market accounts for Glasgow City in section 4.8.1 and the labour market accounts for all the metropolitan cores presented in section 3.3.3.1 show that the labour market responses to employment decline in Glasgow are typical of those in other British metropolitan areas. The previous section showed that the overall slackness of the metropolitan labour market is similar to that for all the metropolitan areas as a whole.

However, two aspects in which the core of the Glasgow conurbation is different to the other British metropolitan cores are worth mentioning. First, the proportion of households in Glasgow in the social rented sector is higher, with 57% in the sector in 1991 compared to 39% across the other cores, ranging from 31% in Leeds to 46% in Manchester¹⁴. Second, car ownership is lower, with 66% of households in 1991 having no car compared to 51% for the other metropolitan cores as a whole, ranging from 41% in Leeds to 57% in Liverpool¹⁵. Both these factors can be hypothesised to compound the impact of employment deconcentration on residents of the core of the Glasgow conurbation because of lower residential and transport mobility. However, the rates of owner occupation and car ownership in the City of Glasgow are both rising, therefore in these respects, Glasgow is converging with the other metropolitan cores in Britain.

In relation to other specific metropolitan areas, chapter two illustrated that there are important generalisations which can be made about most of the eight metropolitan areas, although it was noted that the polycentric forms of the South and West Yorkshire conurbations make them slightly unusual (but they remain consistent with the spatial mismatch perspective on local labour markets). Two important factors are true in the six other metropolitan areas. First, employment deconcentration has occurred, and to a substantial degree, in each with the exception of Tyne and Wear. Furthermore,

¹⁴ Source: 1991 Census of Population

¹⁵ Source: 1991 Census of Population

employment deconcentration in each has been greater than that of population, leaving less jobs per worker in the cores over time, again with the exception of Tyne and Wear (Turok and Edge, 1999). Second, unemployment rates are greater in the cores than in the rings.

The polycentric nature of the South and West Yorkshire conurbations means they do not conform to the broad core/ring model, either in terms of unemployment rates or employment deconcentration. However, as noted in chapter two, because *both* these factors are atypical in these metropolitan areas, this is consistent with the spatial mismatch view of metropolitan unemployment patterns.

More generally, the spatial mismatch perspective on unemployment patterns, when generally formulated as in the conceptual framework outlined in chapter three, is not dependent upon a core/ring pattern, although it is in this context that the spatial mismatch hypothesis in particular has been applied. The firm relocation methodology used here, as noted in section 4.3, seeks to detect spatial barriers to employment, which could exist in any urban structure, or indeed in a rural area. Based on finding evidence of spatial barriers to employment, however, it can be concluded, *a priori*, that residents of locations, such as metropolitan cores, which have experienced declining employment opportunities per worker over a sustained period of time, will face a spatial mismatch problem in securing employment.

4.8.8 Policy salience

The decline of employment opportunities and the concentration of unemployment and its associated social and environmental problems within the Glasgow conurbation are of strong concern among policy makers. For example, Glasgow City Council has identified strategic industrial sites onto which it is hoped to attract large industrial users in order to help combat high rates of unemployment across the City (Glasgow City Council, 1997aa).

In addition, eight key areas within the core of the conurbation have been identified as having particularly acute unemployment problems (Glasgow City Council, 1997aa).

These areas are the four peripheral (to the core, not the whole conurbation) social housing estates of Castlemilk, Drumchapel, Easterhouse and Pollok; plus the East End, Glasgow North, the Gorbals and Govan, representing 'traditional' inner city areas.

In addition, a number of local economic development companies have been established, focussed on improving business development and employment prospects in disadvantaged neighbourhoods. These have core funding from the Scottish Executive, for example the Govan Initiative and Drumchapel Opportunities. However, small-scale economic development initiatives such as these are generally not spatially co-ordinated with housing improvement programmes. Furthermore, regeneration priorities in the City continues to focus strongly on housing improvements, investment in community amenities, and in some cases training provision, rather than local job creation.

At the Scottish level, the Scottish Executive has introduced Social Inclusion Partnerships (SIPs) which focus on similar strategies to tackle spatially concentrated disadvantage, including unemployment (although a small number of SIPs are themed and operate over a large geographical area). Out of a total of 48 SIPs across Scotland, 13 have been designated in Glasgow. This is more than double the number that would be predicted based on Glasgow's share of Scotland's population, reflecting the scale of the problem of neighbourhood disadvantage within the City of Glasgow. These examples highlight the urgency with which disadvantage in the core of the Glasgow conurbation is held by policy makers both within and outwith the City.

At the UK level, the City of Glasgow has been designated an Employment Zone which enhances the delivery of the New Deal, as noted in chapters one and two. This highlights the severity of the unemployment problem experienced in the core of the conurbation. However, if the unemployment rate in the City of Glasgow is higher than elsewhere partly because of the deconcentration of employment opportunities rather than lacking skills and motivation of the unemployed, then this enhanced New Deal approach may be ineffective at tackling the unemployment problem in the City.

4.9 Summary and conclusions

This chapter has performed five key tasks. First, it has outlined the main types of methodologies used by previous work to test the spatial mismatch hypothesis, and has identified some not insubstantial weaknesses associated with them. Second, it has identified a potentially fruitful alternative methodology in the form of 'natural spatial experiments'. Third, it has explained the logic of the firm relocation approach as a 'natural spatial experiment', and has developed specific hypotheses to empirically test in order to address the three research objectives of this work. Fourth, it has provided a reflective critique of the firm relocation approach. Finally, it has provided a justification for testing the spatial mismatch hypothesis in the Glasgow conurbation, and in so doing has provided background contextual information relating to the Glasgow conurbation.

Three main methodologies have previously been used to test the spatial mismatch hypothesis. First, the commuting behaviour of workers from central city locations has been compared with that of those who live in the suburbs. The logic behind this methodology is that if workers resident in metropolitan cores are spatially dislocated from job vacancies, then they will, *ceteris paribus*, be required to commute further. Second, the wages paid by employers in the central city have been compared with those paid by similar employers for similar jobs in the suburbs. The logic behind this methodology is that employers in tighter (lower labour surplus) suburban labour markets will, *ceteris paribus*, need to pay higher wages in order to attract and retain staff. Third, measures of the proximity of jobs to each neighbourhood within a metropolitan area have been specified, and the relationship between this and neighbourhoods' unemployment rates examined.

These three methods do not capture information on the processes operating through time and do not shed light on the nature and magnitude of different types of spatial barriers to employment (Holloway, 1996). Using cross-sectional data, these methods have suffered from multi-collinearity, the non-measurement of less tangible characteristics valued by employers, and ambiguities in how to interpret some of the findings, since the processes

operating through time to produce cross-sectional associations have not been investigated (Houston, 2001).

An alternative approach to test the spatial mismatch hypothesis which has been used infrequently to date is to exploit 'natural spatial experiments'. For example, when a firm relocates within a metropolitan area, the spatial relationship between the employees' residence and workplace is altered, while the characteristics of the individuals and the nature of the jobs are held constant. The employees' responses in terms of whether they commute to the new site, leave their job or move house to be closer to work tell us about the nature and magnitude of spatial barriers to employment within metropolitan areas. This is a controlled experiment in which the spatial behaviour of particular individuals is tracked through time. Thus, this approach has the added advantages of also being able to shed light on the processes operating through time to give rise to spatial variation in unemployment rates, and also to provide data on the nature of specific spatial barriers to employment, namely commuting, migration and job search/ recruitment.

Forced housing relocations, for example when public sector housing is demolished, and significant improvements to transport infrastructure also constitute 'natural spatial experiments'. However, firm relocations are more practical examples to exploit, owing to the fact that they occur with greater frequency.

Each of these four methodologies have strengths and weaknesses associated with them. These have been explained in the text previously in this chapter and are summarised in table 4.5. On balance, the firm relocation approach (an example of a 'natural spatial experiment') provides the most appropriate framework in which to examine the three objectives of this research:

- 1) to establish whether there are commuting constraints within metropolitan areas which cause some people to become unemployed;

- 2) to establish whether there are constraints on residential mobility within metropolitan areas which prevent some people from migrating to be closer to suitable jobs; and
- 3) to establish if job search and/or recruitment processes present spatial barriers to employment within metropolitan areas.

Within the firm relocation methodology, ten specific hypotheses have been developed in order to address the three specific research objectives. These are summarised in relation to each research objective to which each hypothesis is addressed in table 4.3 in section 4.4.1.

The empirical work carried out in the course of this work was based in the Glasgow conurbation in West Central Scotland. It is appropriate to test the spatial mismatch hypothesis in the Glasgow conurbation on eight grounds:

- 1) that employment deconcentration over recent decades has been greater than that of population, suggesting that there is indeed 'spatial mismatch' on the ground;
- 2) that the conurbation has higher unemployment rates in its core than in its ring;
- 3) social housing and other housing for lower income and lower-skilled groups, whose transport and residential mobility is low, is over represented in its core;
- 4) car ownership rates are lower in the core than the ring;
- 5) its geographical size;
- 6) the slackness of the overall metropolitan labour market;
- 7) the spatial patterns of employment change and unemployment rates are similar to those in other British metropolitan areas (Turok and Edge, 1999), giving the results a degree of generalisability to other metropolitan areas in Britain; and
- 8) the decline of employment opportunities and the concentration of unemployment and its associated social and environmental problems within the Glasgow conurbation are of strong concern among policy makers.

The following chapter outlines the data required to operationalise the firm relocation methodology. The data constraints faced in the operationalisation of the research are

described and the choices made are clearly stated. The firm relocations and the data collected are then briefly outlined. The subsequent part of the thesis, organised into three empirical chapters, analyses the data collected in relation to each of the three research objectives of this work respectively. It also considers which groups of people are affected the most by the different types of spatial barrier to employment within metropolitan areas, and examines qualitatively the problems faced by people and the decision-making processes gone through in making employment, housing and transport choices.

Table 4.5 The weaknesses and strengths of methods to test the spatial mismatch hypothesis

Method	Weaknesses	Strengths
Com- parison of commuting times	<ol style="list-style-type: none"> 1) Selective migration may be partially employment led 2) Cannot reveal the mechanisms through which space acts as a barrier to employment 3) Constrained opportunity, i.e. some people may be restricted to local jobs 4) Does not control for different groups' propensity to commute 	<ol style="list-style-type: none"> 1) Comprehensive coverage of a metropolitan area 2) Focus on commuting which is central to the spatial mismatch hypothesis
Com- parison of earnings	<ol style="list-style-type: none"> 1) Selective migration may be partially employment led 2) Cannot reveal the mechanisms through which space acts as a barrier to employment 3) Wages may not respond to all labour demand and supply conditions 4) There are other reasons for suburban employers to pay higher wages 5) Does not take account of mechanisms which could ameliorate the effects of low proximity to jobs such as commuting and housing costs 	<ol style="list-style-type: none"> 1) Comprehensive coverage of a metropolitan area 2) Earnings are potentially a good indicator of the balance between labour demand and supply, if other factors can be controlled for
Measures of job proximity	<ol style="list-style-type: none"> 1) Selective migration may be partially employment led 2) Cannot reveal the mechanisms through which space acts as a barrier to employment 3) Accessibility measures are often misspecified 4) Inaccurate measurement of the friction of distance e.g. straight-line distance 5) Jobs rather than job vacancies are used to calculate accessibility 	<ol style="list-style-type: none"> 1) Comprehensive coverage of a metropolitan area 2) Conceptually transparent and straight forward
Firm relocations	<ol style="list-style-type: none"> 1) Generalisability of results beyond the firms and employees in question 2) Some people who leave their jobs because of the relocations may have been enabled to do so because they have alternative employment opportunities available closer to home 3) The results are sensitive to the economic cycle and the tightness of the local labour market in which a particular firm relocation study is carried out 4) There may be attachment or commitment between employees and firms 5) The nature of jobs may at the time of the relocation, for example due to changed production methods, thus diluting the validity of firm relocation as a spatial experiment 6) There is interaction between the decision of an individual to leave their job because it relocates and to move house to be within commuting range 7) There may be competing interpretations of why those recruited since the relocations might live closer to the firms' new sites than members of retained staff 	<ol style="list-style-type: none"> 1) The problem of selective employment lead migration is controlled for 2) The mechanisms through which space is a barrier to employment can be investigated, particularly commuting and migration but also the availability of information across space 3) Longitudinal approach allows processes through time to be captured 4) Qualitative element allows individuals' precise motives and decision-making processes to be analysed 5) It can be established if the skills profile of the workforce resident in metropolitan cores influences employment deconcentration 6) Largely avoids to problem of multi-collinearity by having in-built controls for the characteristics of the workforce 7) Controls for difficult to measure skills/characteristics such as attitude 8) Differences in mode of travel and commute propensity are automatically controlled for in the experiment

5. DATA REQUIREMENTS AND DATA COLLECTION

5.1 Introduction

The previous chapter explained the logic of the firm relocation methodology and developed ten hypotheses to be tested. This chapter outlines both the data ideally required to operationalise the firm relocation methodology, and the data that were available in practice.

The next section of this chapter (section 5.2) outlines the data ideally required to test each of the ten hypotheses. It also outlines aspects of particular firm relocations which need to be guarded against in order to ensure the validity of each firm relocation as an undiluted 'natural spatial experiment', whereby the relationship between home and workplace is the only thing to change. It also explains the value of qualitative interviews in order to better understand the nature of space as a barrier to employment. A means of measuring the friction of distance is explained which does not fall foul of the limitations of straight-line distance or of relying solely on either travel cost or travel time.

Section 5.3 then describes the 16 firm relocations which were included in this study, including details of how they were identified and the geographical accessibility of their new locations compared to that of their previous locations. Section 5.4 then explains how the firms' employees were surveyed and interviewed, as well as explaining how the interviews with firms' managers were carried out. Two specific methods of dealing with gaps in the data collected are explained. Section 5.5 considers the data available to accurately measure the friction of distance. Section 5.6 then outlines the data collected and response rates, before considering possible biases in the data.

5.2 Data requirements

The data required to test the ten hypotheses developed in this study are outlined in this section. This relates to a preferred scenario, in other words the data which would be used in the hypothetical situation where access to data was unlimited.

5.2.1 *The firms*

First, it is necessary to identify a firm or firms which are soon to, or have recently, relocated within the Glasgow conurbation, including the locations of their origins and destinations. Second, background information on the firm or firms in terms of their industrial group and the jobs they offer is required in order to assess how representative they are of all firms in the Glasgow conurbation.

Third, it is important to ensure that the firms in question are not relocating away from areas within metropolitan areas which have poor quality workers, in order to distance themselves from those workers (Fernandez, 1994). This would be evidence of skills mismatch influencing the local demand for labour. Therefore, the manager or managers involved with the decision to relocate need to be asked the reasons for the relocation.

Fourth, any changes to the production methods used at the destination and associated changes in the skills required of their employees needs to be investigated. If the firms alter the jobs on offer at the destination, then the firm relocation is not a pure 'natural spatial experiment', as space would not be the only factor to change. In this scenario, some employees may leave their job, not because of the journey to work, but because they lack the skills to work at their employer's new site (Fernandez, 1993).

Fifth, some firms may offer incentives to staff in order to ensure they do not lose staff because of their relocation. Such incentives need to be investigated in order to assess if the incentives reduce the number of workers who leave their jobs because of the relocations than would otherwise be the case.

Finally, the spatial nature of the firm relocations also needs to be investigated. In particular, the distances of the relocations are important, as is the ease of commuting to the new sites.

5.2.2 *The employees*

In order to test hypothesis one (see table 4.3 in section 4.4.1 for a summary of the research objectives and hypotheses), ideally, information on the rate at which employees quit their jobs is required for a period before and after the relocation. The 'before' period could be considered to represent usual staff turnover and therefore would act as a control or reference against which to compare the 'after' period's staff attrition rate. However, some people may leave their job prior to the relocation in anticipation of not being able to commute to the new site, while others may commute to the new site before deciding the commute is unmanageable. Therefore, data would ideally cover a period of at least one year either side of the relocation. Preferably, data on staff attrition on a monthly basis would enable a time series to be plotted.

Hypotheses three to ten all relate to the separation between the homes and workplaces of workers. Therefore, employee addresses need to be known in order to test these hypotheses. Hypothesis ten relates to recruitment at the firms' new sites, therefore information needs to include on-going recruitment, not only the staff directly affected by the relocations.

These requirements point towards the need for firms to provide personnel records for a period covering before and after the relocation which include the addresses of individuals. A unique employee identifier would be required in order to enable employees to be matched between time periods, and thus to identify those who leave their job. A unique identifier which could fulfil this purpose might be, for example, a staff number (but which, after an employee leaves, is not reissued to new recruits starting with the firm). Alternatively, employee details could be used to match individuals, such as their full name, address and date of birth, if these could be used without breaching Data Protection legislation.

In order for a firm to preserve past personnel records and to ensure maximum access to accurate data, the preferred scenario would be to carry out a 'before' and 'after' study. This would also mean that people who leave their job around the time of the relocations

could be identified. A follow-up postal or telephone survey of quitters would allow their fate to be investigated, thus providing a test of hypothesis two.

This thesis also aims to assess which groups of people are more adversely affected than others by the firm relocations (and, by implication, by space as a barrier to employment). Therefore, information is required about the characteristics of individuals, such as occupational group, income, housing tenure, age, and their mode of travel to work. In addition, information on the length of service with the firm is required to act as a statistical control, since this may correspond with loyalty to, and familiarity with, employers thus reducing employees' propensity to leave their job.

Hypotheses six and eight in relation to household mobility ideally need to consider other household members' workplaces, in addition to the household member whose job has relocated. A household may be less likely to move house to be closer to the workplace of one member of the household if this would lengthen the journey to work of another household member. Therefore, it would be desirable to obtain information on the workplaces of other household members of the firms' employees. However, the locational choices of households may place more importance of the workplace of a primary earner, since they may earn more and may be more likely to remain in their job for longer. Therefore, it is also useful to know if an individual is the primary or secondary earner in their household, or if they live with their parents.

Some information relating to employees may be included in personnel records, such as job title (from which occupational group could be derived), income, age and length of service with the firm. However, information not directly relevant to their employer will not be included, such as housing tenure and mode of travel to work. In addition, information about other members of employees' households will not be available from personnel records.

The level of detail required about individuals and their households suggests that a questionnaire survey would be needed in addition to an analysis of personnel records. This would enable information to be gathered regarding individuals, their travel to

work, their housing, and the household in which they live. In addition, information on the location of other household members' workplaces could be gathered.

This thesis aims to investigate, not only the extent, but also the nature of commuting, residential mobility and job search/recruitment as spatial barriers to employment within the Glasgow conurbation. Qualitative interviews with workers would provide rich detailed data regarding the precise nature of the problems people face in commuting, moving house and finding out about job vacancies in different parts of the Glasgow conurbation. The reasons for people leaving jobs, moving house or not moving house can be investigated in more detail using qualitative information rather than relying solely on quantitative data. Interviews with the firms' managers would provide qualitative insights to the spatial nature of recruitment, including where jobs are advertised and which, if any, positions are difficult to fill.

In summary, the four preferred data collection methods for the firm relocation methodology to test the spatial mismatch hypothesis are:

- 1) personnel records covering a period either side of the relocations;
- 2) a self-complete questionnaire of leavers, retained staff and new recruits;
- 3) qualitative interviews with leavers, retained staff and new recruits; and
- 4) qualitative interviews with managers of the firms.

5.2.3 The friction of distance

A measure of the separation between home and workplace (or the 'friction of distance'), is required to test hypotheses three, four and six to ten. As explained in the previous chapter, using straight-line distance is an inaccurate proxy for the actual time, cost, inconvenience and unpredictability of travel. More significantly, the previous chapter also illustrated how the use of straight-line distance underestimates the burden of commuting undertaken by core city residents and public transport users, thus introducing a bias against finding evidence in support of the spatial mismatch hypothesis. A more sophisticated measure of the friction of distance is required which takes account of the time, cost, inconvenience and unpredictability of travel.

'Generalised travel cost' provides such a measure. This measures travel time between two points, applies a monetary value of travel time to that figure and then adds the direct monetary costs of travel such as fares, fuel and car parking. Time spent walking and waiting for public transport services is included in generalised travel cost, and public transport mode and interchange penalty factors can be applied (Bruzelius, 1979). These penalty factors take account of, for example, the unpredictability of public transport travel times and the inferiority of public transport in terms of comfort and convenience compared to car travel. Values of time for different parts of trips, for example time spent in a car, on a bus or waiting for a bus are derived from surveys comparing travellers' choices made between cheaper, slower routes or modes, and more expensive, faster routes or modes. For example, if a car driver chooses a route avoiding a £1 bridge toll which takes ten minutes longer, then this implies that this individual values their time at less than £6 per hour (although in calculating values of time, extra fuel costs and vehicle occupancy would also be included). When many such choices, or 'revealed preferences', are analysed, average values of time can be calculated. In addition, stated preference surveys are also used to assess the value of travel time by asking people's willingness to pay for hypothetical travel time savings¹⁶.

¹⁶ The 1994 perceived value of travel time (VOT) in Strathclyde was 380.8 pence per hour (Strathclyde Passenger Transport Executive, personal communication). This is based on national revealed preference and stated preference surveys, regionally weighted by variations in income levels. The data used for this study relate to 1996, as most of the firm relocations were in 1995, 1996 or 1997. The 1994 perceived value of travel time is converted to a 1996 figure thus:

$$1996 \text{ VOT} = 380.8 * 1.019 * 1.08 = 419 \text{ p/hr.}$$

Where:

1.019 = GDP growth 1994-5

1.08 = SPTA's forecast GDP growth 1995-6

For details of the calculation of perceived values of travel time, see Bruzelius (1979) and Highway Economics Note 2, volume 13, section 2 (Department of Transport, 1997).

Note that a forecast is used for 1995-6 regional GDP growth as modelling work done with the purpose of forecasting traffic flows and public transport demand is required prior to the year being modelled for strategic planning purposes. Total generalised travel cost is 'skimmed' off from the first stage of running the travel demand forecasting model. Later, once actual 1995-6 GDP growth is known, there is no need to rerun the model for 1996 to generate estimated travel demand and traffic flows as by this time the out-turns are known from traffic and public transport surveys.

Generalised travel cost is used by transportation planners in mode choice models for a particular metropolitan area and is validated against observed travel choices.

Adjustments may be made to some values of time or to a 'mode penalty factor' applied to a particular mode of travel's generalised cost in order to reflect actual travel choices known from travel surveys in a given metropolitan area. Generalised travel cost is thus 'behaviourally relevant'. In other words, it is based on actual travel choices and 'perceived' values of travel time, rather than on 'resource' values of travel time, such as those based on average hourly earnings, which are used to evaluate the direct economic benefits of proposed transport infrastructure investments.

This first section of this chapter (section 5.2) has outlined the ideal data requirements for the firm relocation methodology. The following sections outline the data which were available and how they were collected.

5.3 The firms

This section explains what firm relocations were considered to be in scope for inclusion in this study, outlines methods used to identify firms, and explains how firms were contacted. It then considers the representativeness of the firm relocations of all firms in the Glasgow conurbation. The reasons for the relocations are then outlined in order to ensure that firms were not moving to distance themselves from workers lacking skills. Information on whether or not there were any changes to the skills required to perform the jobs at the firms' destinations is presented, and any incentives offered to employees to remain with the firms assessed.

Finally, the spatial nature of the relocations are described, with reference to the significance of whether firms make decentralising or centralising moves within the conurbation. A map showing where the sixteen firms included in the study relocated from and to is presented. The accessibility of the firms' new locations, particularly by public transport, is then assessed.

5.3.1 Identifying firm relocations

A 'before' and 'after' longitudinal firm relocation study would enable the people who leave their job because of the relocations to be identified. However, it was not possible to design a method to identify firms prior to them relocating. Therefore, this study utilises a 'retrospective longitudinal approach', in that it makes a post-hoc examination of what happened when firms relocated in the recent past.

Initially, it was hoped that it would be possible to identify one large employer that had relocated within the Glasgow conurbation and would be able to provide detailed personnel records covering a period before and after the relocation containing employees' home address, job title, age, gender, qualifications, date of appointment etc. This would have allowed a large part of the analysis to have been based on these data, generating a statistically robust sample size. A firm employing around 500 people would have been considered adequate for such an analysis in order to provide robust information on quit and move rates over a two year period, assuming 'normal' quit and move rates of approximately 10% per annum.

However, such a firm could not be identified. Therefore, the decision was made to identify several smaller firms which had relocated within the Glasgow conurbation during the three years or so prior to the survey work. The surveys were carried out throughout 1998. A three year period prior to this was considered a suitable trade-off between generating enough firms and gaining insight from fresh memories of the impact of the relocation and being able to trace those who left their jobs as a result of the relocations. The primary consideration was generating a large sample of employees. An advantage of including several firms rather than only using one is that a greater variety of types of employer, jobs offered and types of relocation are included in the study, for example in terms of firm size, industrial sector, the nature of the origins and destinations of the firms, and the distance and orientation of their relocations.

Any firm identified as having relocated within the Glasgow conurbation was considered in scope for the study, with the exception of firms making short moves of less than a mile or so on the basis that this did not constitute a sufficiently significant alteration in

people's commutes in order to qualify as a 'natural spatial experiment'. The 'Glasgow conurbation' was defined as the main contiguous built-up area in West Central Scotland. This corresponds to the area covered by the 11 local authority districts shown in the maps presented in the previous chapter.

Five different means were utilised to identify firms which had relocated within the Glasgow conurbation. The first means to identify firms was through the Glasgow and the Clyde Valley Structure Plan Joint Committee's 1996 Industry and Business Survey. This covered all occupiers of new industrial and business floor-space built from mid-1991 to mid-1996, and a 10% sample of occupiers of existing premises. The survey asked if the occupier is a new, expanded or relocated firm, and, if relocated, asked for the previous address. The Glasgow and the Clyde Valley Structure Plan Joint Committee agreed to identify for the study firms which had relocated. Because the firms' identity was confidential, the Glasgow and the Clyde Valley Structure Plan Joint Committee contacted firms by telephone to obtain their consent for their identity to be released for the purposes of this research. Initially the Structure Plan Committee's search focused on firms which had relocated a significant distance (for the purposes of the search, this was defined as moving from one district to another within the conurbation) and which also employed a large number of people. A simple strategy of starting with the largest and working down the list was employed. The Glasgow and the Clyde Valley Structure Plan Joint Committee had a low success rate in persuading firms to participate (two out of the ten firms contacted). The Glasgow and the Clyde Valley Structure Plan Joint Committee reported that the reason cited by several of the firms for declining to participate was that they lost most of their staff during the relocation (which of course is a significant finding in support of hypothesis one itself), so did not perceive themselves to be in-scope for the study (even although this did not preclude them at all). Others said that they were simply too busy.

The second means of identifying firms was through Glasgow City Council. As a sponsor of this research, the Council provided the names of some firms which had relocated, derived from local knowledge and the press.

The third means of identifying firms was through Local Enterprise Companies and local authorities' planning and economic development departments which were contacted by letter and telephone. Some said they had no records of firms relocating in or out of their area of jurisdiction and some said such information was confidential, while some gave the names of firms over the telephone. Others provided indirect evidence in the form of lists of firms creating or shedding jobs in the area. These lists were used fruitfully in conjunction with Dunn & Bradstreet Trade Directories for adjacent years. All firms in the lists were looked up in both the 1996 and 1997 editions of Dunn & Bradstreet. If a firm's address is different in the two years, then the firm is likely to have relocated between the two addresses, although in some cases only a small number of HQ staff had relocated, therefore these cases were not pursued further.

The fourth means of identifying firms was through public reports. Some public agencies and local authority departments supplied back copies of economic reports which contain news of economic change, including firm relocations. The Glasgow Economic Monitor and the North Lanarkshire Economic Bulletin were particularly useful in this respect. Trawling through the mainstream press was attempted, but did not prove fruitful.

Fifth, industrial estates were visited, the firms present noted, and each firm subsequently contacted by telephone to ask if they had relocated from elsewhere in the conurbation when they first occupied the premises. This was effective only for estates which have been created within the last few years. Older estates obviously have a lower proportion of firms recently relocated there. This approach yielded a number of firms, although most had relocated less than a mile therefore were not considered in scope.

The possibility of compiling a comprehensive list of firm relocations within the conurbation over a particular time period was investigated. The only apparent source of this information is the Scottish Property Network. This is a database maintained by Paisley University which contains all commercial property transactions in Scotland. However, discussion with researchers who maintain the database revealed that many property transactions are associated with mergers and acquisitions, and firms remaining

in situ purchasing leased premises from property companies. Therefore, each case would have to be investigated in order to determine whether or not it is associated with a firm relocation. This would have been a time-consuming process for the researchers at the Scottish Property Network, therefore this approach was not pursued further.

5.3.2 *Contacting firms*

Firms were telephoned to confirm that they had indeed relocated and to obtain the name of the Managing Director or General Manager. Some receptionists and personal assistants were the source of illuminating comments regarding the relocations. Paraphrasing one, “Oh, we lost most of our staff over that so I doubt he’ll want to speak to you, but I’ll give you his name anyway”; and another, “We do have problems getting people out here – a lot of new staff either leave or buy a car”.

The Managing Director or General Manager was sent a letter outlining the research project and requesting co-operation. A small number of firms responded by letter, either positively or negatively, but the majority did not respond. These were telephoned a fortnight or so after the initial letter was sent and asked if they would participate. The majority agreed after asking a few questions about the project. Others agreed immediately and some required persuasion. Twenty-four relocated firms in scope for the study were identified, of which 16 agreed to take part. All 16 firms distributed questionnaires to their staff, and 13 of these firms agreed to be interviewed.

5.3.3 *Representativeness of the firms*

The sixteen firms included in this study are mostly involved in manufacturing and/or distribution in a variety of sub-sectors from highly skilled engineering design and machining to lower-skilled electronics assembly. Some of the firms manufacture and distribute low order goods, mainly bakery products, for consumption within West Central Scotland, but sometimes further afield into eastern Scotland and north-west England. Some firms are only involved in sales, distribution and after sales customer services. One firm is the Scottish HQ of a national construction firm, providing financial planning, project management, engineering and surveying functions. Appendix one provides a firm-by-firm description of the firms and their relocations.

The representativeness of the firms in the sample of all firms in the Glasgow conurbation needs to be considered. Table 5.1 shows the industrial composition of firms and their workforces in a Strathclyde Regional Council (SRC) 1991 survey of *new* industrial premises, a SRC 1989 survey of *all* business premises and in this work's survey (the column headed 'survey (1998)').

Table 5.1 Industrial composition of sampled firms and their employees in comparison to previous surveys

Sector	Firms (%)			Employees (%)		
	All (1989)	New (1991)	Survey (1998)	All (1989)	New (1991)	Survey (1998)
Manufacturing	42	40	63	66	57	80
Construction	13	9	6	10	6	7
Distribution	17	18	25	10	16	11
Services	25	31	6	14	20	2
Not known	3	2	0	0	1	0
TOTAL	100	100	100	100	100	100

As can be seen, manufacturing firms are over represented in the sample used for this work, while service sector firms are under represented. This is true of the number of firms and the number of employees. However, the deconcentration of manufacturing jobs from the Glasgow conurbation has been more pronounced than that of service sector jobs, as has been the case in all British metropolitan areas (Turok and Edge, 1999), therefore the representativeness of the sampled relocated firms of the changing distribution of jobs overall is closer to reality than that implied in table 5.1.

5.3.4 Reasons for relocation

It is important to ensure that the firms sampled for this work are not relocating in order to distance themselves from a sub-standard workforce found in the core of the Glasgow conurbation, as this would compromise the validity of the firm relocation approach as a spatial experiment (Fernandez, 1994). The overwhelming reason for the firms in this

study making the decision to relocate is to obtain larger premises, being the primary reason cited by ten out of the 13 firms which were interviewed. Two of the 13 firms cited changes in property ownership and leases as their primary reason for relocating, and one was given a lucrative offer for their site by a retail developer.

In looking for a new site, firms have a strong tendency to use public agencies, particularly the Local Enterprise Companies. Although property brokers are also used, firms generally have a high degree of awareness of the type of public aid available to them, so do a lot of liaison through public agencies. A few firms mentioned the need for a speedy process in getting the new site arranged.

An important factor in attracting firms to sites is the availability of adjacent land for future expansion, being cited by six of the 13 firms. Motorway access is also important to manufacturing firms with a product of high bulk to value ratio. The image of the location is also important for several of the firms. The tax benefit of the Lanarkshire Enterprise Zone is also a significant consideration of firms moving there. The quality and quantity of local amenities for workers is also a consideration, particularly car parking but also retail facilities.

Only one of the 13 firms questioned the quality of Glasgow's workers, although, in the case of this firm, this was also associated with the issue of using an employment agency to fill lower-skilled positions. In addition, this was only a secondary consideration in the decision of where to move *to* and was not a 'push' factor in the decision to move *from* Glasgow.

Therefore, the quality of the workforce resident in metropolitan cores does not appear to have influenced to any significant extent any of the firms' decisions to relocate. Indeed, firms employing a high proportion of lower-skilled employees, for example in electronics assembly, are aware of the commuting constraints faced by these workers, particularly women, so these types of firms in this study recognise the need to locate close to suitable workers.

5.3.5 Changes to jobs and incentives offered

If the firms alter their production methods and/or management practices at their new location, then part of the reason for employees leaving their jobs may be a 'skills mismatch' between the skills they possess and those required for the tasks they are asked to perform at the firms' new locations. However, only one of the firms altered its production process at the time of the relocation. This involved increased mechanisation and a shift away from Fordist production towards multi-skilled teams and the rotation of tasks.

There was a small amount of regret or annoyance expressed in some of the interviews which were carried out with employees as part of this research at the change people associated or anticipated with the relocations. Some people thought that the atmosphere was not the same as it was before, or that managers' attitudes had become more harsh. This may encourage some people to leave their job and thus may act to counter the decreased quit propensity because of a wish to stay with an existing employer through loyalty or job satisfaction.

Some of the firms offered small incentives to retain staff. This means that the number of leavers may have been greater had these incentives not been offered. For example, one of the firms provided bus transport to the new site, charging 50p per trip. It was withdrawn after ten months as demand for it dwindled as workers left their jobs, bought cars or arranged lift-shares. Another firm ran a mini-bus at no charge for a period of nine months. Another firm made a one-off discretionary payment of £100 to each member of staff to compensate them for inconvenience associated with the relocation. Another firm obliged staff with company cars to give lifts to other staff. However, apart from perhaps the two firms providing 'works' buses, incentives to retain staff were minimal.

5.3.6 The nature of the firm relocations

Map 5.1 shows the origins and destinations of the sixteen firm relocations. The firms on average relocated 50.5 generalised minutes¹⁷ by car or 135.9 generalised minutes by public transport. Weighting by the number of employees at the time of relocation to give the average 'distance' each employee's job relocated gives 40.9 generalised minutes by car or 115.9 generalised minutes by public transport.

Map 5.1 shows that the firms included in the study made relocations from a wide variety of locations across the conurbation. The original locations of firms tended to be in older more established industrial areas, many within the boundary of Glasgow City, and many close to the River Clyde. However, some moved from modern industrial estates, although usually the more established estates, for example firm number seven moving from Newhouse Industrial Estate and firm number 13 moving from an estate on the edge of East Kilbride New Town.

Five out of the 16 firms relocated closer to the centre of Glasgow, while 11 out of 16 moved further away. Of these 11, two were those which amalgamated plants at a single location, the components of which were a mix of centralising and some decentralising

¹⁷ Most people think of their commuting burden in terms of time rather than cost. Therefore, all commutes in this work have been expressed as generalised time. Generalised cost is converted to generalised time simply by dividing by the value of time.

For clarity, consider the following hypothetical bus journey where the value of time is 419p/hr:

Walk to bus stop = 2 minutes
6 buses/hr = 10 minute headway therefore mean wait time is $10/2 = 5$ minutes
Fare = 100p
Actual travel time of trip = 30 minutes
Walk to destination = 1 minute
Bus mode penalty factor = 1.1

$$\begin{aligned} \text{Generalised Cost} &= [(2/60\text{hrs} * 419\text{p/hr} * 2) + (5/60\text{hrs} * 419\text{p/hr} * 2) + 100\text{p} + (30/60\text{hrs} * \\ &419\text{p/hr}) + (1/60\text{hrs} * 419\text{p/hr} * 2)] * 1.1 \\ &= [27.9\text{p} + 69.8\text{p} + 100\text{p} + 209.5\text{p} + 14.0\text{p}] * 1.1 = \mathbf{461.9\text{p}} \end{aligned}$$

$$\text{Generalised Time} = 461.9\text{p}/(419\text{p/hr}) = 1.102 * 60 \text{ mins} = \mathbf{66.1 \text{ minutes.}}$$

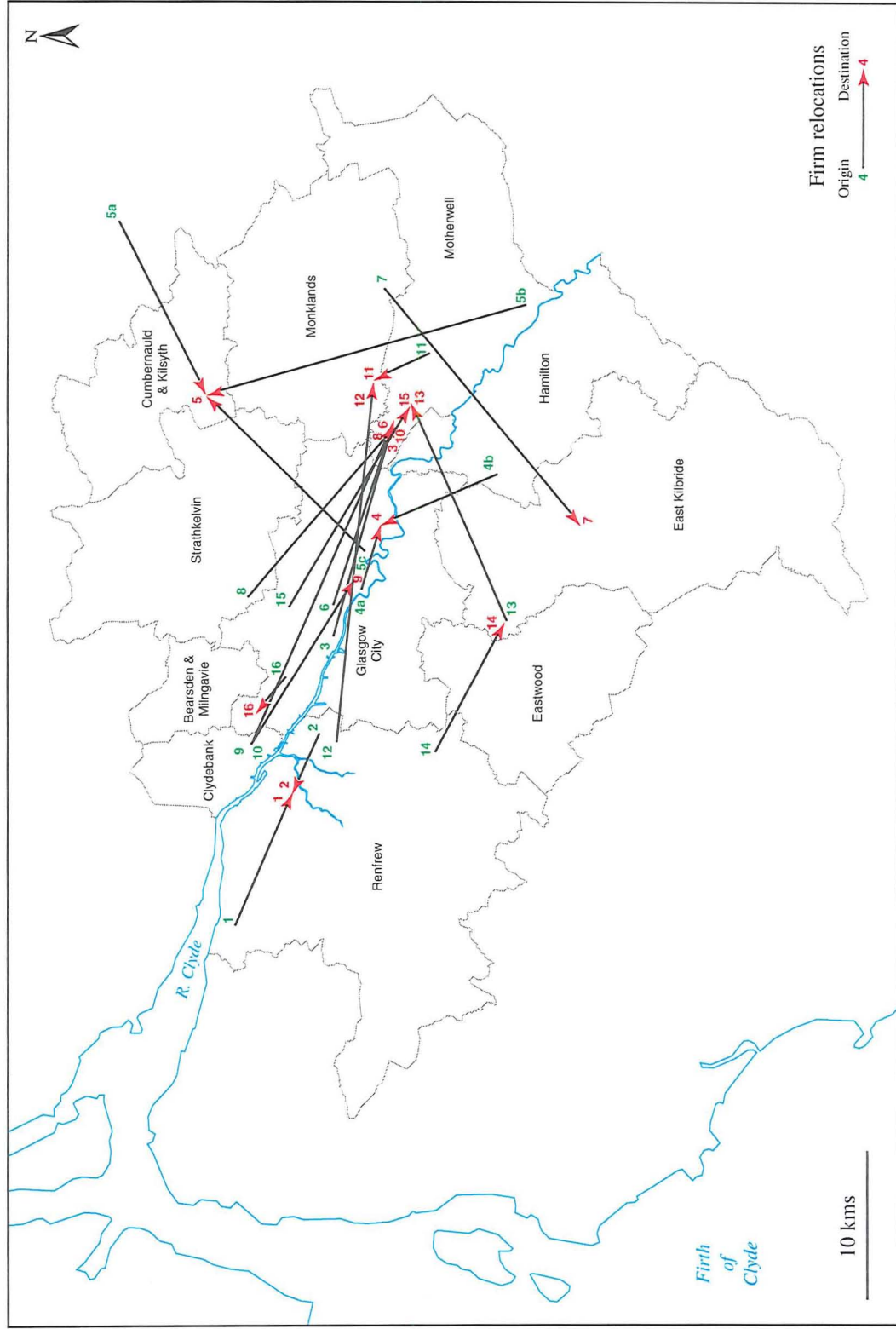
Note that the walk and wait times have been multiplied by two, as it has been empirically shown travellers are on average willing to pay twice as much to reduce walk and wait time than they are to reduce in-vehicle time (MVA Consultancy, 1987). In the case of car travel, cost is simply the sum of monetised time, fuel costs and average parking charges, all divided by average vehicle occupancy to give a cost per person rather than a cost per vehicle.

moves. However, in both cases the vast majority of staff were employed at the plants which moved in a decentralising direction (4a and 5c on map 5.1).

Initially, it had been hoped to restrict the analysis to firms which made decentralising moves since this reflects the dominant trend in the changing spatial distribution of jobs within metropolitan areas. However, as indicated previously, it was difficult to identify a large number of firms which had recently relocated within the Glasgow conurbation. Therefore, in order to maximise the sample size, it was decided to include all types of firm relocations (apart from moves of less than a mile), for example firms relocating within the ring of the conurbation and firms moving closer to Glasgow city centre. Although, as argued below, this does little to compromise the validity of the firm relocation approach to test the spatial mismatch hypothesis, it would have been preferable to have been in a position to restrict the data collection to only decentralising firms simply to avoid ambiguity.

The fact that some firms makes a centralising move rather than a decentralising move does not compromise the logic of the 'natural spatial experiment' methodology in its ability to test how far certain types of people are able to commute to certain types of jobs. It is not likely to be either significantly easier, or more difficult, to commute away from Glasgow city centre than to commute towards it, apart from the fact that a 'reverse' commute, if undertaken during the peak hour, may have a low frequency of public transport services operating. However, counter to this, public transport and car travellers commuting during the peak hour will encounter less traffic congestion on a 'reverse' commute. In addition, shift and part-time workers will often commute outwith peak hours, when there is unlikely to be any difference in the ease of travelling either towards or away from Glasgow city centre. Therefore, it does not matter methodologically that some of the firms' relocations do not reflect the dominant deconcentration trend in spatial employment change, because the impact on individuals' commuting is the same whether the firm makes a centralising or decentralising relocation.

Map 5.1 The firm relocations



More important is the nature of the firms' destinations in terms of accessibility, particularly by public transport. The vast majority of the firms moved to industrial estates, which may be served poorly by public transport, including the destinations of firms moving closer to Glasgow city centre. In addition, many of the 'centralising' firms are relocating from the outermost fringes of the conurbation to other parts of the ring, in some cases to the same industrial estates as some of the decentralising firms.

However, the residential attractiveness of the destination of a firm's relocation may influence the likelihood of workers choosing to migrate closer to it. Specifically, as the majority of the firms sampled in this work made decentralising moves, there may be a non-causal association between the suburbanisation of their workers for reasons of residential attractiveness and the decentralisation of their jobs. In other words, people may shorten their commute when they move house, but commute reduction may not have been part of their residential location decision. However, this does not affect to such an extent the testing of hypotheses five, six and seven, as these test whether commute reduction is a *push* factor in people's decision to move house *from* their current location, and say nothing about the location they choose to move *to*.

The suburbanisation of population due to residential desirability may, however, affect the testing of hypotheses eight and nine which relate commute length to the likelihood of those who move house taking the opportunity of shortening their commute as a result. In other words, hypotheses eight and nine relate to the journey to work as a *pull* factor in households' decisions as to where to move house *to*. Central residents are more likely to make a move to the suburbs for reasons of residential desirability than suburban residents are to move towards the core (Glasgow City Council, 1994). Since the majority of the firms in this study made decentralising moves, it is core residents who will have the longest commutes to the new site. In contrast, people who already live in the suburbs and enjoy good residential attractiveness will have shorter commutes to the new sites. This would mean that those with longer commutes to the new sites would indeed be more likely to shorten their commute when they move house, but their locational decision may be due to residential attractiveness rather than a particular desire to shorten their commute.

However, this assumes that firms and workers move within spatial segments of a 'pie' with Glasgow city centre at the heart. If a firm relocates from one side of the conurbation to the other (i.e. between pie segments), then suburban residents who previously had short commutes will have long commutes to the new sites, indeed longer than any resident of the core. Six of the 16 firms in this study made cross-conurbation moves, and three others made moves between adjacent segments which will have the effect of lengthening suburban residents' commutes while leaving core residents' commutes largely unchanged. Overall, only three of the 16 firms made decentralising moves within the same 'pie' segment of the conurbation to which this potential methodological issue arises. This reinforces the value of including firms making different types of relocations, and not limiting the sample to only decentralising firms.

In addition, if a core resident lived on the opposite side of the city centre to their employer, then this individual would be increasing his/her commute by making a move to a suburb in the same pie segment in which they currently live. Hypotheses eight and nine, if accepted, would thus show that people are constrained by commuting to move to only particular suburban pie segments on the same side of the conurbation as their employer, although a bias in favour of the rejection of these hypotheses may have been, to a small extent, artificially enhanced by suburbanising moves of people within the same pie segment as their employer.

5.3.7 The geographical accessibility of the firms' new sites

Table 5.2 shows mean generalised travel time to the old and new sites by car and public transport, first from all other zones in the conurbation to give an indication of the overall impact on the general accessibility, and second from George Square at the heart of Glasgow city centre. The means are weighted by the number of employees with each firm at the time of relocation in order to reflect the overall impact of changing employment patterns on the employees. This should be treated as a crude proxy for changes in geographical accessibility, as it does not take account of variations in the level of competing workers at different locations across the conurbation (see chapters three and four for fuller explanations of this). However, it does provide an accurate

assessment of the implications for the ease with which existing employees might be able to travel to the new sites.

Table 5.2 Mean travel times to firms' old and new sites (generalised minutes)

Point of reference	Car		Public transport	
	To old sites	To new sites	To old sites	To new sites
From all zones	57.9	58.5	125.5	129.4
From George Sq.	38.7	45.2	78.8	85.1

It takes on average slightly longer to travel to the new sites from any point in the conurbation than it does to the old sites. However, we would not necessarily expect general accessibility to change, as it does not have a fixed reference point from which to measure accessibility, whereas accessibility *to* a particular point in space varies from where accessibility is measured *from*. Of particular interest to this study is urban deconcentration, therefore George Square, at the heart of Glasgow, has been taken as a reference point. As can be seen, both car and public transport travel time to the new sites significantly increase, reflecting the general tendency for employment to decentralise. However, the percentage increase in car travel is 17% compared to 8% in public transport. Thus, although travel from the centre of Glasgow to the new sites has increased for both modes, the situation has actually been made relatively worse for car drivers. Given the denser provision of public transport in central areas, this finding is initially surprising. It can probably be accounted for by the fact that because the majority of the firms moved *away* from George Square thus making the journey from George Square to their locations *longer*, the fixed walk and wait time associated with public transport trips becomes a smaller proportion of public transport travel time in a longer trip. However, note that public transport generalised travel time remains nearly double that of car travel. Changes in the relative position of the two modes are shown in table 5.3.

Table 5.3 Public transport:car generalised travel time ratios to firms' old and new sites, to George Square and across the Glasgow conurbation as a whole

Point of reference	To old sites	To new sites	To George Sq.	To all zones
From all zones	2.17	2.21	1.81	2.04
From George Sq.	2.04	1.88	.	1.81

Overall, there is a slight worsening in the position of public transport travel in relation to travel by car as a result of the relocations, with the ratio increasing from 2.17 to 2.21. Even the old employment sites were worse served by public transport relative to car when compared to the global average (all zones to all zones) of 2.04. However, as noted above, there is a *relative* improvement in the position of public transport for travel from George Square, with the ratio of public transport to car generalised travel time falling from 2.04 to 1.88. However, the ratio of public transport to car generalised travel times from George Square to the new sites remains worse than ratio for travel to all locations from George Square, the latter being 1.81.

Specifically in relation to those in the sample who were employed at the time of the relocation, two-thirds (110) had their commutes lengthened while only one-third (57) had their commutes shortened. If workers were randomly distributed across the conurbation in relation to where they work, this would be split in equal proportions. All of the eight who left their job because of the relocations had, or would have had, their commutes lengthened. These figures are based on mode weighted averages to control for variations in the mode by which people in the sample travel to work.

5.4 The employees

The first section of this chapter outlined a preferred four-pronged approach to collecting information about the impact of the firm relocations on the firms' employees, and on the location of 'new recruits' (those recruited at the new sites). The four preferred data collection methods were:

- 1) personnel records covering a period either side of the relocations;
- 2) a self-complete questionnaire of leavers, retained staff and new recruits;
- 3) qualitative interviews with leavers, retained staff and new recruits; and
- 4) qualitative interviews with managers of the firms.

In operationalising the research, it became clear that comprehensive personnel records were rarely kept after the relocations. In the process of relocation, records were frequently lost or discarded. In cases where comprehensive records were available, they tended to be in a very inaccessible form, for example back-dated successful application forms. In the cases where records were comprehensive and accessible, firms were unwilling to compromise confidentiality by allowing an external researcher to view them, and firms were unable to commit the time to extract anonymised data.

Therefore, it became apparent that data collection methods had to be adapted to data availability. Had addresses been available from personnel records for a period either side of the firm relocations, an aggregate analysis of quitting and moving behaviour would have been performed to test hypotheses one to nine, and of the location of new recruits to test hypothesis ten. The self-complete questionnaires could have been posted to people's homes in order to provide more detailed information on the characteristics of leavers and retained staff, for example in terms of their skill level, income, gender, household position and mode of travel to work.

5.4.1 A survey of employees

In the absence of information on workers' addresses from personnel records, questionnaires were administered to employees in the workplace. This provided information on the residential location of members of retained staff and of new recruits, albeit based on a sample rather than on a full 'count', which personnel records would have provided. It also provided detailed information on the characteristics of retained staff and new recruits. The identities of leavers were provided by some of the firms themselves, who were then contacted by post or telephone. Slightly different questionnaires were designed for retained staff, new recruits and leavers, in order to

reflect the different circumstances of these three groups. These questionnaires are reproduced in appendix two.

All the participating firms opted to administer the questionnaire themselves, rather than allowing direct access to the workplace and employees. Free-post envelopes in which to return the questionnaires were provided. The completed questionnaires were coded in the software package *Statistical Package for Social Scientists* (SPSS). Job titles were coded into social class based on occupation, using the 1991 Census classifications (Office of Population Censuses and Surveys, 1991).

It was aimed to obtain 500 returned questionnaires in total. The average employee weighted time lag between the firm relocations (the time frame of reference of the migration questions) and the surveys was 23 months. This means that, assuming a residential mobility rate under normal circumstances of 10% per annum, 500 returned questionnaires would have included approximately 95 movers, plus any people persuaded to move house because of the firm relocations. Assuming average annual staff turnover of 15% per annum, this would have generated approximately 140 returned questionnaires from new recruits. A minimum sample size of people who left their jobs because of the relocations was not considered, because the question of whether such people exist or not is the basis of the firm relocation methodology.

5.4.2 Hypotheses one to four (commuting constraints)

The workplace based survey, being administered *after* the firm relocations, obviously could not capture any leavers, as would have been possible through a postal survey using addresses from personnel records covering a period *prior* to the relocations. This problem was addressed by asking the managers of the firms to report the numbers and identity of workers they lost *specifically because of the journey to work to the new site*. Information reported by the firms on the numbers of staff lost due to the relocation can be used to address hypothesis one.

However, the firms may underestimate (due to lacking knowledge of leavers' reasons for resigning from their jobs) or underreport (in order to appear a more socially

responsible employer) the number of people they lost because of their relocation.

Therefore, an accounting method was developed in order to estimate the true number of people who left their jobs because of the firm relocations. This is explained later in this section.

In order to address hypotheses three and four, leavers' addresses or approximate residential locations (for example, their postcode) need to be reported by the managers.

In order to establish if the leavers actually ended up in weaker economic positions (hypothesis two), however, their name and address or telephone number needs to be released by the firm in order for them to be surveyed or interviewed.

5.4.3 Hypotheses five to nine (residential mobility)

Using personnel records which covered a period either side of the firm relocations, the residential mobility rate of retained staff in a period after the relocations could have been compared to their residential mobility rate prior to the firm relocations. This would have determined if the relocations induced people to move house who would not have done so otherwise (hypotheses five, six and seven).

The workplace survey of 'retained staff' and 'new recruits' captures information on the rates at which retained staff and new recruits move house, which is needed to test hypotheses five, six and seven. In the absence of available personnel records, the residential mobility rate of retained staff was compared with that of new recruits as a control group. To reinforce conclusions drawn from this comparison, retained staff who had moved house since their employer relocated were asked in the workplace survey if they would have moved house had their employer *not* relocated.

In order to test hypotheses eight and nine in relation to propensity to shorten commutes by moving house, information was collected in the questionnaire about where people moved from and to. In addition, they were asked about their reasons for moving.

5.4.4 Hypothesis ten (job search and recruitment)

Personnel records would have allowed an aggregate analysis of the residential location of those recruited at the new sites compared to the residential location of retained staff. However, a face-to-face questionnaire would have also been required to provide individual-level data on people's characteristics and associated information such as job search methods used.

The survey administered in the workplace captures information regarding the residential location of both new recruits and members of retained staff. Thus, the workplace survey generates the information required to test hypothesis ten.

5.4.5 Qualitative interviews with retained staff and new recruits

Interviews were carried out in the workplace with a sample of retained staff and new recruits. Interviewees had in all cases filled in a questionnaire and volunteered themselves for interview, so some questions were directed towards specific responses from their questionnaire on a case-by-case basis. This meant that efficient use of time could be made which was vital as these interviews were conducted during work time, therefore had to be short. Other, more general, questions were asked relating to: employment and housing histories and future aspirations; job search methods and experiences; real and hypothetical journey to work constraints; and initial reactions to their employer's relocation. These more general questions appear in the interview schedules in appendix three.

Rapport was important to establish, as some interviewees appeared slightly apprehensive initially. This was achieved by reassuring them that their responses would be confidential and would not be seen by their employer, and by starting the interview with basic questions about the job they do and whether they enjoy it. These interviews were tape recorded and notes taken from the tape soon after the interview. After initial analysis, the material from the semi-structured qualitative interviews was thematically coded.

5.4.6 Leaver surveys and interviews

Leavers were sent a letter to their home address explaining why they had been contacted and that a researcher would telephone them during the following week. A survey was carried out over the telephone (similar in design to the workplace questionnaire) followed by supplementary open-ended questions similar to those asked in the semi-structured interviews with retained staff and new recruits. Interview schedules are shown in appendix three. Again, these interviews were tape recorded and notes taken soon after the interview, which were subsequently thematically coded.

Some names and addresses supplied by firms were 'ex-directory' therefore could not be telephoned. In these cases, the questionnaire and a free-post envelope were sent along with a covering letter. If the questionnaire was not returned within a fortnight or so, another questionnaire, envelope and letter were sent. The questionnaire asked if the respondent was prepared to be interviewed, and if so, to provide their telephone number.

5.4.7 Management interviews

Interviews were arranged with firms. These were usually with the Managing Director or the General Manager, occasionally with the personnel manager, and sometimes with both, depending on the firm's and individuals' willingness to commit time.

These interviews focused on: the reasons for the relocation; methods of premises search; criteria in site selection; the nature of the business; the nature of jobs carried out by staff before and after the relocation; loss of staff associated with the relocation; the impact of the move on staff retention; means of advertising vacancies; recruitment criteria; difficult to fill vacancies; and attitudes to recruiting locals and the unemployed. An interview schedule is contained in appendix three. These interviews were also recorded and notes taken from the audio tape soon after the interview. As with the employee interviews, the material was thematically coded.

These meetings also provided a platform to discuss the availability of staff records and of the logistics of administering the questionnaire in the workplace (as was necessary with every firm), and conducting the staff interviews. Not all the firms permitted staff

to be interviewed, and those that did stipulated that interviews should not impinge upon an excessive amount of staff time.

5.4.8 Analysing the number and characteristics of leavers

Unfortunately, only four out of the 16 participating firms were willing and able to release the identity of workers who left because of the relocations. The others, however, were either not prepared, or were not able, to release this information. The identities of only twelve leavers were provided by the four firms which released this information. Eight of these twelve completed a questionnaire, seven of whom were interviewed in-depth over the telephone.

In light of the practical problems encountered with the firm relocation methodology, in particular the lack of access to personnel records and the low number of leavers whose addresses the firms were prepared to release, it was considered whether or not to abandon the approach. However, it was decided to continue because: 1) operationalising an innovative methodology is an original contribution of the thesis in itself, even if it ultimately proves limiting in generating robust data; 2) the time frame for completing the work to the satisfaction of the sponsor would not have allowed this¹⁸.

There are two problems which arise due to relying on the firms themselves to report the number and identity of workers who left because of the relocations. First, it is suspected that the firms underestimate the true number of relocation induced leavers. Some firms appeared reluctant to admit that their decision to relocate had an adverse impact on some of their employees. This may be due to a desire to be seen in a favourable light as a socially responsible employer. Firms were also reluctant to spend time inspecting records in order to provide a comprehensive list of leavers during a period of time around the time of relocation. Rather, managers produced names from memory of people they thought had left because of commuting difficulties to the new sites. They may have been selective in the names they passed on in order to ensure that the former employees would be those more likely to present the employer in a favourable light.

¹⁸ Some delay was imposed upon this work by the renegotiation of the broad aim with the sponsor, from addressing issues of population deconcentration to issues of employment deconcentration.

Furthermore, managers only produced names of former employees whom they know, or perceived, to have left because of the journey to work. Others, however, may have left because of the journey to work but not given this as their reason for leaving. Similarly, the journey to work may only be a contributory factor to the decision to leave, nevertheless a significant one, yet the manager being interviewed does not perceive it to be so, therefore does not pass on the individual's name. Some managers consulted other members of staff and some consulted past records to inform their assessment of who left around the time of the move, but some performed this task purely off the top of their heads. Note that managers were asked to report the number and identity of people who left specifically because of the relocation, and not people who left coincidentally at the time of the relocation, possibly for other reasons.

The second problem associated with relying on firms to report the identity of staff who left due to the relocations is the small number of firms willing to release the identity of leavers. Since only seven leavers were surveyed, this does not provide a sufficient number of observations from which to draw conclusions regarding the characteristics of leavers to be compared against the retained staff (for example, occupational group, income, age, mode of travel to work, household situation, etc.).

Two strategies were pursued to address these two problems. First, an accounting method was developed to estimate the number of people who left their jobs because of the firm relocations, based on the level of recruitment at the firms' new sites. Second, in order to more accurately analyse the influence of people's characteristics on how susceptible to spatial barriers to employment people are, those retained staff who stated that they have considered leaving their job because of the journey to work were combined with the seven people who actually did leave their jobs because of the journey to work. These two approaches are now explained in more detail.

5.4.8.1 Estimating the true number of leavers

To deal with the problem of firms underestimating or consciously underreporting the true number of leavers, a method was devised to estimate the actual number of people who left their jobs because of the relocations. The estimation was done using the following formula:

$$L = R - T - E$$

Where:

L = True number of relocation induced leavers

R = Recruits since relocation

T = Normal staff turnover

E = Expansion of staff (staff at time of survey minus staff at time of relocation).

This calculation is based on the fact that recruitment of staff is done to either fill vacancies created by normal staff turnover, or to expand the firm's workforce. Thus, any people recruited who cannot be accounted for by these two categories can be assumed to be replacing people who left because of the relocation. Firms were asked to state their staff turnover by occupational group in the twelve months prior to February 1999 when they were contacted again to obtain this information. In most cases this was considerably more than a year after the relocation so can be considered to represent 'normal' staff turnover, unaffected by the relocation. It should be stressed that this estimate should be treated with caution, as it is based on extrapolation from some small numbers from particular firms and staff turnover within a particular firm is likely to vary considerably through time.

5.4.8.2 Assessing the characteristics of leavers

The small number of identified leavers presents an additional problem for the research in that little can be concluded about leavers' characteristics based on only eight individuals (seven of whom stated categorically that they left because of the journey to work). This problem was addressed by combining the people sampled who left their job because of the journey to work to the firms' new sites with a sub-group of retained staff

who stated that they had *considered* leaving their job specifically because of the journey to work. The characteristics of this new group are compared against the characteristics of those who stayed with their employer over the period of the relocation but did *not* consider leaving their job because of the journey to work. This is illustrated diagrammatically in figure 5.1.

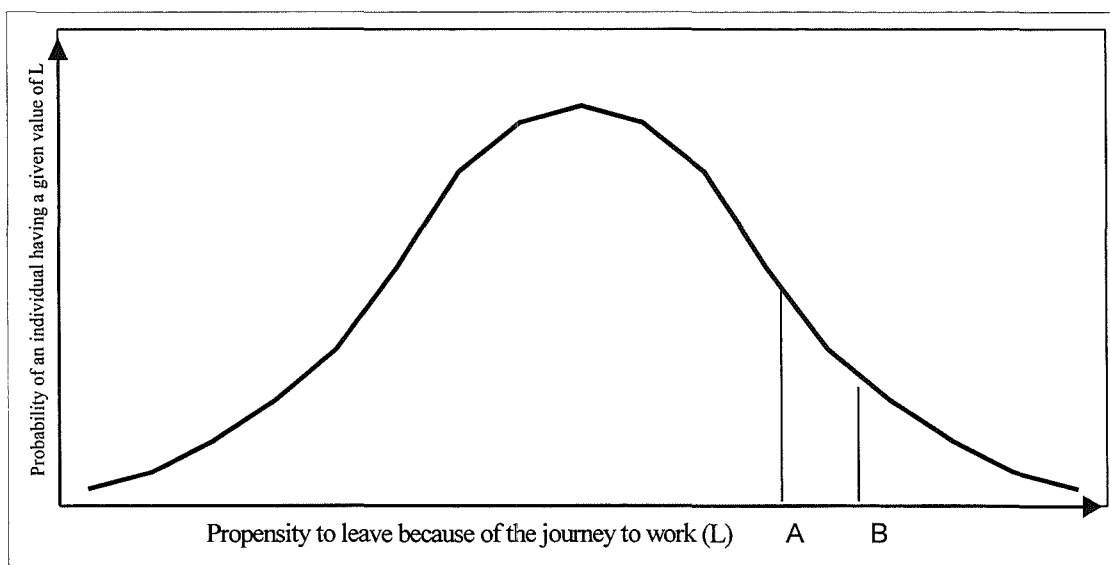
In order to perform logistic regression which calculates a probability, in this case of an individual leaving their job because of the journey to work, the dependent variable must be in the form of binary values (in this case, 0=not susceptible to leaving because of the journey to work; 1=susceptible to leaving because of the journey to work). Given that the sample is small overall, combining these groups is effective use of the data. To carry out multi-variate analysis of the determinants of *three* different degrees of propensity to leave because of the journey to work, for example by the use of a nested logit model, would be difficult to support given the size of the sample. However, when simple descriptive tabulations of the data are presented in the following chapters, data are presented broken down by the three categories in the interest of providing a comprehensive descriptive analysis of the data collected.

Figure 5.1 shows the normal distribution of probabilities of an individual having a given propensity to leave their job because of the journey to work (L), with these three groups identified. In the logistic regressions of individuals' propensity to leave their job because of the journey to work, the characteristics of people left of A are compared with the characteristics of those right of A, rather than comparing the characteristics of people left of B with the characteristics of those right of B.

Figure 5.1 implies a validity in combining those who left their job because of the journey to work with those who have considered leaving their job because of the journey to work. However, it is likely that people who say they have considered leaving their job because of the journey to work vary in how seriously they have considered this. Some may have given it serious consideration while others may have only considered it in passing. The latter's journey to work may not actually be too onerous. However, the

combination of these two groups in order to perform logistic regression is considered effective use of the available data.

Figure 5.1 Normal distribution of propensities to leave because of the journey to work, with analysis groups marked (*illustrative only*)



$L < A$ *Not considered leaving because of the journey to work*

$A < L < B$ *Considered leaving because of the journey to work*

$L > B$ *Left because of the journey to work.*

5.5 The friction of distance

Generalised travel cost, as explained in section 5.2.3, is the most accurate means by which to measure the friction of distance. These data were made available by the Strathclyde Passenger Transport Authority (SPTA) in the form of 652 x 652 zone matrices covering an area extending beyond the conurbation for the inter-peak time period for both public transport and highway. In the case of public transport, the zone card cost matrix was used as the SPTA considered this the most appropriate for journey to work trips which are made several times a week. The appropriate cost was coded in SPSS for each respondent in the survey, for travel by both car and public transport. This was done by manually assigning postcodes from the questionnaires to the zone labels used in Strathclyde Passenger Transport Authority's model, and then looking up the appropriate generalised costs in both the public transport and highway matrices. Generalised cost was converted into generalised time in SPSS by dividing by the value of time.

The use of generalised travel cost does, however, have some limitations. First, all costs are calculated from zone centroid to zone centroid, but obviously not all residents live in the centre of zones. However, this error is minimal as the zones are small (in the case of the Strathclyde data used in this study, most zones correspond to a postcode sector, the spatial units used in the maps of the Glasgow conurbation which were presented in the previous chapter.

Second, not all workers travel to work at the same time of day. It was decided to use the inter-peak cost matrix as an error minimising compromise. Some workers travel during the peak period, but shift workers travel early in the morning and in the evening. Part-time workers will make at least one commute per day outwith the peak travel hours and/or will travel to work less than five times per week. The SPTE was able to make travel costs available for either the peak or the inter-peak periods. For the reasons outlined here, the inter-peak period travel costs seem the most appropriate.

The questionnaire used in the employee survey did not ask for the mode of travel to work used by members of employees' households. Therefore, in calculating total household travel costs, the mode of travel of other working members of the household had to be predicted by a model. The following characteristics of other working household members were asked in the questionnaire: relationship to person completing the form (from which other household members' gender was derived); whether or not they are the main earner; their job title (from which their social class based on occupation was coded); and finally the name and address of where they work (from which postcodes and thereafter generalised travel costs were coded). A binary mode choice model (private or public) was calibrated based on *employees'* mode of travel (which is known) and their characteristics. This model was then used to predict the mode of travel of other working members of households based on their characteristics, thus enabling mode specific generalised travel costs to be coded ('mode weighted' where means are calculated). A mode choice model was calibrated using the following variables: social class based on occupation, housing tenure, gender, household income and whether an individual is the household's primary earner or not. These are all the variables for which data are known for other household members, plus 'household' and

'housing' variables which are common to all household members thus are the same as that reported for the person filling in the questionnaire. The problem with this model, however, was that the data for other household members was poorly completed, therefore only a small number of mode choices could be predicted using this model. Therefore, a simpler mode choice model was calibrated using social class categories (based on occupation) as the only independent variable. This model correctly predicted 81% of people's known mode choices. In effect, this simple model assumes that all in the unskilled category travel by public transport, walk or cycle and all others travel by a private means of motorised transport.

With hindsight, since all the data collected in this work have come from questionnaires rather than staff records, it would have been possible to simply ask respondents how long it takes them to travel to work. This would have removed the need for the time consuming exercise of matching postcodes with zones from the Strathclyde transport model and manually looking up costs between zone pairs. However, to be as accurate as generalised travel cost, respondents would also have to report monetary cost and the two would need to be combined using a value of time. In addition, self reporting of travel time would not include 'hassle' costs, e.g. higher value of walking and waiting time, mode penalties and interchange penalties. Furthermore, people may not have a good perception of travel cost and travel time, or may be biased towards stating the longest it can take even although this may only happen infrequently. In addition, their memory of their journey to their employer's previous location, or from their previous home, may not be accurate.

5.6 Response rate and possible biases

5.6.1 Response rate and the characteristics of the sample

As explained in the previous sections of this chapter, there is some evidence to believe that some firms declined to participate because they lost most of their staff. Although this makes them of profound interest to this study, they perceived this to make the study less feasible or worthwhile, therefore declined to take part. It is difficult to know the precise magnitude of this bias, but suffice to say that it will lead to an underestimation overall of quit rates rising in response to firm relocations.

Experience showed that those firms which impulsively agreed and those which required persuasion may not have been committed to the project. For example, these firms tended to have very low response rates to the questionnaire survey. The fact that response rates were much lower than other similar firms suggests that not all staff were directly presented with a questionnaire. Perhaps the questionnaires were left in a pile in the canteen or were not aired at all. If this is the case, then the response rates reported below should be treated with caution as it is unknown how many of the questionnaires delivered to each firm were actually distributed to staff.

At the times the firms relocated, they employed 1,168 people. However, a maximum of 953 workers (and in likelihood less than this) received a questionnaire, as one firm reported that it was able only to distribute questionnaires to its office staff and not to its 215 shop floor employees. Completed questionnaires were obtained from 173 members of the original workforce (165 retained employees and eight leavers), representing a response rate of 18.2% of the original workforce. This ranged from 0.5% to 83.3% from individual firms, with smaller firms consistently achieving higher response rates. As some firms may not have distributed all the questionnaires delivered to them, these figures do not necessarily reflect the response rate achieved from those receiving a questionnaire. Omitting firms with a response rate of less than 10% in order to omit some of those which may not have distributed the questionnaire to all staff, the overall response rate was 24.8%. In assessing the overall efficiency of the method, the first figure (18.2%) is the most appropriate. In considering the potential for response bias, the second figure (24.8%) is more appropriate.

A further 76 questionnaires were received from staff recruited by the firms at the new sites, giving a total of 249 completed questionnaires. To recap, the 249 returned questionnaires consisted of 165 retained staff, eight leavers and 76 new recruits.

Semi-structured qualitative interviews were carried out in the workplace with 14 members of retained staff. Similar semi-structured qualitative interviews were carried out, also in the workplace, with three new recruits. The sample of workplace

interviewees was selected in an unstructured stratified manner. In practice, this entailed selecting people who had changed their mode of travel to work, had considered leaving their job because of the journey to work, had moved house or had considered moving house to be closer to work. The semi-structured qualitative interviews allowed the reasons for these changes people made, or considered making, to be investigated in more detail. Of the 12 leavers identified by firms, eight of them completed questionnaires, seven of which were also interviewed over the telephone.

Of the 165 retained staff, 32 had considered leaving their job because of the journey to work. These 32 were combined with the seven people who left their jobs because of the journey to work and compared with the remaining 133 retained staff in order to assess the characteristics of those most likely to leave their job because of the journey to work.

Table 5.4 summarises the number of returned questionnaires and qualitative interviews carried out with people in the different categories for analysis.

Table 5.4 Summary of surveys and interviews

Analysis category	Surveyed	Interviewed
Retained staff, not considered leaving because of JTW	133	3
Retained staff, considered leaving because of JTW	32	11
Leavers*	8	7
New recruits	76	3
TOTALS:	249	24

** One of the eight leavers identified by the firms said that the journey to their employer's new site was not part of the reason they left. However, they also said that they would not have left their job had the firm not relocated, but did not provide a specific reason for leaving their job. This person has been excluded from the analysis of propensity to leave because of the journey to work but has been included in the analysis of the fate of leavers, as this appears to be the most literal interpretation of what they said when interviewed.*

It is difficult to assess the response rates achieved among different groups, for example women, as the denominators are unknown. However, firms were asked about their staffing levels and turnover by occupational group. This allows response rates by occupational group to be calculated. Not all firms gave this information, therefore these response rates should be treated as estimates for the overall sample. The response rates

by occupational group are shown in table 5.5. This is important in order to assess the degree of non-response bias introduced in relation to the characteristics of the sample.

Table 5.5 Estimated response rates by occupational group

Occupational group	n	Estimated response rate
Professional	7	14%
Managerial/technical	59	55%
Skilled non-manual	95	53%
Skilled manual	46	32%
Semi-skilled	32	10%
Unskilled	6	2%

The managerial/technical and skilled non-manual categories achieved good response rates in excess of 50%. Professionals achieved a low response rate, possibly because they may be under more time pressure at work, or may feel they are part of the firms' decision-making process therefore do not qualify to complete one. Manual and lower-skilled workers have lower response rates, probably because they do not work at a desk so it is less easy for firms to directly distribute one to them, they are less likely to have a pen to hand, and are less likely to be close to the firm's out-mail tray.

Three percent of the total sample including leavers (n=249) is professional, 24% managerial/technical, 38% skilled non-manual, 19% skilled manual, 13% semi-skilled, and 2% unskilled. In terms of mode of travel, 67% of responses are private travel, versus 33% public transport. In terms of housing, 74% of the sample is in owner occupation, 15% is local authority, 8% Housing Association, 2% Scottish Homes and 1% private rented. The sample is 62% male and 38% female.

5.6.2 Possible biases

Four potential sources of bias should be borne in mind when considering the results of this work. First, relocating firms may not be representative of all firms. In particular, most of the firms in this work relocated primarily because they had out-grown their premises. Hence, relocating firms are expanding whereas other firms may be static or

declining in size. This means that relocating firms may be offering more secure and/or higher paying employment than other firms, therefore employees may be more inclined to bear a long commute than otherwise would be the case. This is related to the point made earlier that employees may feel a degree of loyalty and attachment to their employer, or may not wish to leave because they are familiar with their job and the people they work with. However, countering this, familiarity may be disrupted as a result of the relocation. Indeed, a degree of unease with broken familiarity and altered management attitudes was expressed in some of the interviews carried out with employees.

Second, self-selection bias may occur when a firm decides whether or not to participate in the study. Indeed, some anecdotal evidence obtained when contacting firms (see section 5.5.1) suggests that those firms which suffered large staff losses were less likely to participate in the study, thus the participating firms may not be representative of all relocating firms. Relocations which caused significant hardship to employees may have resulted in poor industrial relations which managers do not wish unearthed by participating in this study. Indeed, there is some evidence of this. Para-phrasing one candid manager of a firm which declined to take part in the study during a telephone conversation:

"The whole thing was a nightmare; we just about had a fully-blown strike on our hands. I really don't want the workers reminded of it."

Other firms which declined to participate in the study simply said that they lost most of their staff therefore were of no interest to the study. When it was pointed out to them that this in fact made them of great interest to the study, they maintained their position. It may be the case that such firms do not want to disclose the manner in which their employees were treated during the relocation and the hardship it caused them.

The third, related, potential source of bias is the release (or non-release) of leavers' names by participating firms. Firms may underestimate the number of people they lost due to the relocation in order to present themselves as more socially responsible employers, as outlined in section 5.3. This was dealt with by developing a technique to

estimate the true number of people who left because of the relocation, as explained in section 5.3.1.

Finally, as with any survey where participation is voluntary, there exists the potential for non-response bias from the employees within participating firms. It may be the case that those most affected by the relocation are the most likely to complete and return the questionnaire, and to volunteer themselves to be interviewed.

5.7 Summary and conclusions

Comprehensive geo-referenced personnel records covering a period of time either side of firm relocations would provide a rich longitudinal data series with which to test the spatial mismatch hypothesis using the firm relocation methodology. This would allow a detailed analysis of quit rates and move rates by length of commute and induced change in commute. The spatial pattern of new recruits could also be analysed. In order to ensure that firms maintained these records in an accessible format, it would be advantageous to conduct a 'before' and 'after' study of firm relocations. Unfortunately, it was not possible to devise a method to identify firms before they relocated for this research. In addition, it would have been required to carry out the 'before' element a year or so prior to the relocation in order to accurately assess normal staff turnover and residential mobility rates and continue the 'after' element for a year or so after the relocation in order to capture adjustment over time. This type of approach would not have been possible within the time available for this research. Therefore, firms were contacted up to three years after they relocated within the Glasgow conurbation and a 'retrospective longitudinal' study was carried out. Sixteen firms, mostly, but not exclusively, involved in manufacturing and distribution took part in the study. In total, the 16 firms relocated 1,168 jobs.

In order to obtain information on individual, household and housing characteristics, as well as information on mode of travel to work, it is also necessary to carry out primary data collection in the form of a questionnaire. In addition, qualitative interviews with staff would provide a rich understanding of the precise nature of spatial barriers to employment within the Glasgow conurbation. Finally, it is necessary to establish the

reasons for the firms relocating, and investigate the mechanisms used by firms to advertise and fill job vacancies. This suggests the need for qualitative interviews with senior managers of the firms in the relocation study. In summary, ideally, the firm relocation methodology would comprise the following elements of data collection:

- 1) personnel records covering a period either side of the relocations;
- 2) a self-complete questionnaire of leavers, retained staff and new recruits;
- 3) qualitative interviews with leavers, retained staff and new recruits; and
- 4) qualitative interviews with managers of the firms.

In practice, it was not possible to secure access to personnel records in a suitable format covering the required time periods. However, the other three elements of data collection were successfully operationalised.

The firms in this study often did not have well-structured personnel records which would allow the type of analysis described above to be performed. Indeed, some of the firms did not even have personnel records in an electronic medium. In addition, many firms' records were lost at the time of the relocation. Therefore, this information had to be obtained from the survey of employees which was administered in the workplace. This captured people who have stayed with the firms over the period of the relocations, and also people recruited since the relocations at the new sites.

The workers who left their jobs because of the relocations, however, are not captured by this survey. Their identification was dependent upon the firms themselves reporting this information. The firms overall reported losing a number of staff because of the relocations. However, it may be the case that firms are unaware of the reasons that many staff leave and in addition may understate the number of staff who left because of the relocations, in order to present themselves as more socially responsible employers. A technique to estimate the true number of staff lost by the participating firms was devised. This assumes that recruitment is either to replace normal staff turnover or to expand the workforce. Thus, any recruitment in addition to that required for these two

functions in the period after the relocation can be assumed to be to replace workers who left their jobs because of the relocation.

Unfortunately, many firms were unwilling or unable to provide the names, addresses and telephone numbers of individuals who left because of the relocations. In total, only 12 leavers were named, eight of whom returned a questionnaire. This presented the problem of not being a sufficiently large sample from which to draw conclusions about the characteristics of workers who left their jobs because of the relocations. Therefore, those who left and those who considered leaving their job because of the journey to work were combined, and compared as a whole against those who stayed with their employers over the relocations but did *not* consider leaving their job because of the journey to work. Table 5.4 in section 5.6.1 summarises the number of returned questionnaires and qualitative interviews carried out with people in the different categories for analysis.

Possible biases to bear in mind are: the slight over representation of manufacturing and distribution; the firms are expanding; firms which lost a lot of staff due to their relocation may have been less likely to take part in the study; and the firms that did take part may have intentionally or unintentionally underestimated the number of staff they lost because of the relocations. Finally, managerial/technical and skilled non-manual workers are more likely to return a questionnaire; and, *a priori*, the employees and former employees who were the most adversely affected by the relocations may be more likely to return a questionnaire.

This chapter has outlined the data that ideally would have been collected to carry out the firm relocation methodology. Constraints faced in doing so, and measures taken to deal with them, have been explained. How the research was operationalised has been described, and the nature of the firms and their relocations outlined. The data collected were then sketched, including a consideration of any possible biases. Had it been possible to secure access to comprehensive longitudinal personnel records, these would have given the firm relocation methodology the potential for some powerful analysis of spatial processes in local labour markets. However, the quantity and richness of the data

collected provides sufficient material with which to operationalise an innovative methodology to test the spatial mismatch hypothesis. In particular, the data collected allow the ten hypotheses posed in the previous chapter to be tested, and allow an exploration of the characteristics of people which make them more or less susceptible to the three different types of spatial barrier to employment within the Glasgow conurbation.

The next part of the thesis, part III, analyses the data collected in relation to the ten hypotheses developed in the previous chapter. Empirical results are also presented in relation to the characteristics of people who face different types of spatial barrier to employment to varying degrees within the Glasgow conurbation. The importance of different types of spatial barriers to employment in people's employment and housing choices in relation to other factors is outlined. The decision-making processes individuals and households go through in adjusting to spatial changes in the local labour market, and the techniques used to search for work are explored with qualitative findings.

PART III – RESULTS

6. COMMUTING AS A BARRIER TO EMPLOYMENT WITHIN THE GLASGOW CONURBATION

7. RESIDENTIAL MOBILITY AS A BARRIER TO EMPLOYMENT WITHIN THE GLASGOW CONURBATION

8. JOB SEARCH AND RECRUITMENT AS SPATIAL BARRIERS TO EMPLOYMENT WITHIN THE GLASGOW CONURBATION

6. COMMUTING AS A BARRIER TO EMPLOYMENT WITHIN THE GLASGOW CONURBATION

6.1 Introduction

The next three chapters form the third part of this thesis which presents the evidence gathered in relation to testing the spatial mismatch hypothesis in the Glasgow conurbation. The evidence is organised in relation to the ten hypotheses to be tested in order to meet the three objectives of this research, namely to establish whether or not commuting, residential mobility and job search/recruitment present spatial barriers to employment at the scale of a metropolitan area.

This chapter relates to the first four hypotheses which form the basis for testing the first research objective: 'to establish whether there are commuting constraints within metropolitan areas which cause some people to become unemployed'. The next chapter relates to the five hypotheses which form the basis for testing the second research objective: 'to establish whether there are constraints on residential mobility within metropolitan areas which prevent some people from migrating to be closer to suitable jobs'. The final chapter of the *Results* part of the thesis, chapter eight, assembles evidence to bear on the hypothesis relating to the third research objective: 'to establish if job search and/or recruitment processes present spatial barriers to employment within metropolitan areas'.

This chapter is structured as follows. The first section presents data relating to the overall impact of the firm relocations in terms of the numbers and proportions of workers who leave their jobs and move house as a response to the relocations. These are presented together in this chapter because quitting and moving are substitutes for one another, so need to be considered simultaneously.

This chapter then goes on to concentrate on commuting as a barrier to employment by specifically considering the first two hypotheses in relation to objective one. It then considers the impact of different magnitudes of commuting and changes in commuting

induced by the firm relocations on the likelihood of workers leaving their jobs because of the journey to work (hypotheses three and four).

The four hypotheses to be tested in relation to commuting as a barrier to employment are restated here:

H1: some staff leave their jobs because of the firm relocations

H2: those who leave due to the relocations tend to end up in a weaker economic position

H3: those who have, or would have had, the longest (shortest) commutes to the firms' new sites are more (less) likely to leave due to the relocations

H4: those who had, or would have had, their commute lengthened (shortened) the most will be more (less) likely to leave due to the relocations

This chapter then goes on to investigate the importance of the journey to work in causing people to leave their job in comparison to other, non-spatial factors in causing people to leave their jobs. The different groups of people most adversely affected by the firm relocations are then considered. A multi-variate analysis using multiple logistic regression is presented which assesses the relative importance of various spatial and non-spatial factors in determining people's likelihood of leaving their job because of the journey to work.

Material from the qualitative interviews is introduced throughout. However, the majority of it is presented in the section relating to the assessment of which groups of people are most adversely affected by the firm relocations. The bulk of the qualitative material relates most closely to this part of the analysis because its detail in relation to the problems people face in commuting aids the interpretation of the reasons why some groups are more affected by the firm relocations than others.

Finally, the 'summary and conclusions' section summarises the findings, draws conclusions in relation to commuting as a barrier to employment within the Glasgow conurbation and assesses the implications of these conclusions for understanding the

spatial distribution of unemployment within the Glasgow conurbation. The robustness of the findings and conclusions are also discussed.

6.2 Overall impact of the firm relocations

The *raison d'être* for the firm relocation methodology was to assess how many employees could sustain the new commute and, if not, to determine if moving house to reduce the journey to work is a suitable alternative. This section of this chapter assesses the numbers of leavers, retained staff, movers and non-movers. Movers have been included here despite them being the focus of the next chapter because the decision to move house in response to a firm relocation is related to the decision as to whether or not to leave the firm. It is important to consider the numbers of leavers and retained staff simultaneously as leaving a job when it relocates and moving house to be closer to it are mutually exclusive decisions. Because to do one is to remove the need to do the other, it is important to consider the proportion of staff who leave an employer because it relocates alongside the proportion who move house to be within commutable distance of that employer. For example, if not many workers left their job, then this could be interpreted as meaning that commuting is not a problem for them, or it could alternatively be interpreted as meaning that they are able to move house to be closer to work to enable them to shorten what would otherwise have been unmanageable commutes. Previous research has shown that 'moves' and 'quits' are indeed substitutes for one another in that an increase in the probability of an individual doing one reduces the probability of them doing the other (Zax and Kain, 1991).

This section then goes on to relate the number and fate of leavers to hypotheses one and two. Do leavers actually end up in a weaker economic position? Some qualitative findings are also presented in this section with regards to the type of difficulties people experienced in travelling to the firms' new sites.

Figure 6.1 shows: the numbers of people sampled who left their job specifically because of the relocations (i.e. in excess of normal staff turnover); the number of staff who were retained with their employers; and, of the retained staff, the number who moved house. (In contrast to the leavers, all those who moved house are included, not only those who

moved specifically as a consequence of the firm relocations. This has been done because we are interested in assessing whether people who are moving house in any case are able to take the opportunity of moving closer to work (hypotheses eight and nine)).

Of the 165 retained staff, 32 (19%) have considered leaving their job because of the journey to work. Note that the response rate achieved among leavers was significantly higher ($8/12 = 66.7\%$) than that among retained staff ($165/941^{19} = 17.5\%$). This makes the totals in figure 6.1, which show sampled totals, not directly comparable. Therefore, figure 6.2 shows grossed-up figures to reflect the actual, rather than sampled, totals in order to ensure the numbers are comparable. In addition, the figures in figure 6.2 reflect the number of people who left their jobs because of the firm relocations, as reported by the firms themselves, rather than being based on the number of leavers it was possible to include in the actual survey. The totals appearing in the sub-categories of retained staff and leavers are calculated based on the proportions in the sample reported in figure 6.1.

6.2.1 Hypothesis one: some staff leave their jobs because of the firm relocations

Some firms reported losing no staff because of their relocation, while others reported losing up to 50% of their workforce. Overall, firms reported losing 37²⁰ staff, representing 3.2% of the 1,168 staff relocated, although, as explained in the previous chapter, it is suspected that this is an underestimate.

The method to estimate the actual number who left because of the relocations based on the level of recruitment in the period after the relocation, also explained in the previous chapter, yields an estimate of a total of 139 leavers, or 11.9%²¹ of the staff relocated.

¹⁹ 1,168 jobs were relocated by the 16 firms which took part in this study. However, firm number 14 only distributed the questionnaires to office staff and not to its 215 shop-floor staff thus reducing the pool from which to sample to 953. Excluding the 12 leavers sent a questionnaire, this leaves 941 retained staff in the sampling frame.

²⁰ This assumes that firm one's "a few" is three out of 36; and that firm 12's "most of production staff" represents 10 out of all 40 staff including non-production staff (this assumes that half of all staff are production staff and 50% ("most") of those left. See the individual firm biographies in appendix one.

²¹ This is based on the following totals inserted to the formula described in section 5.4.8.1 in chapter five: $L\ rate = [244 - 53 - (579 - 440)] / 440 = 52 / 440 = 11.9\%$ (slight error due to rounding). Note that relocation induced leavers are estimated separately for different socio-economic groups within each firm, meaning that grossing up from sampled to actual totals is taking place from very small numbers, sometimes only one sampled new recruit. Socio-economic groups who have no sampled new recruits from a particular

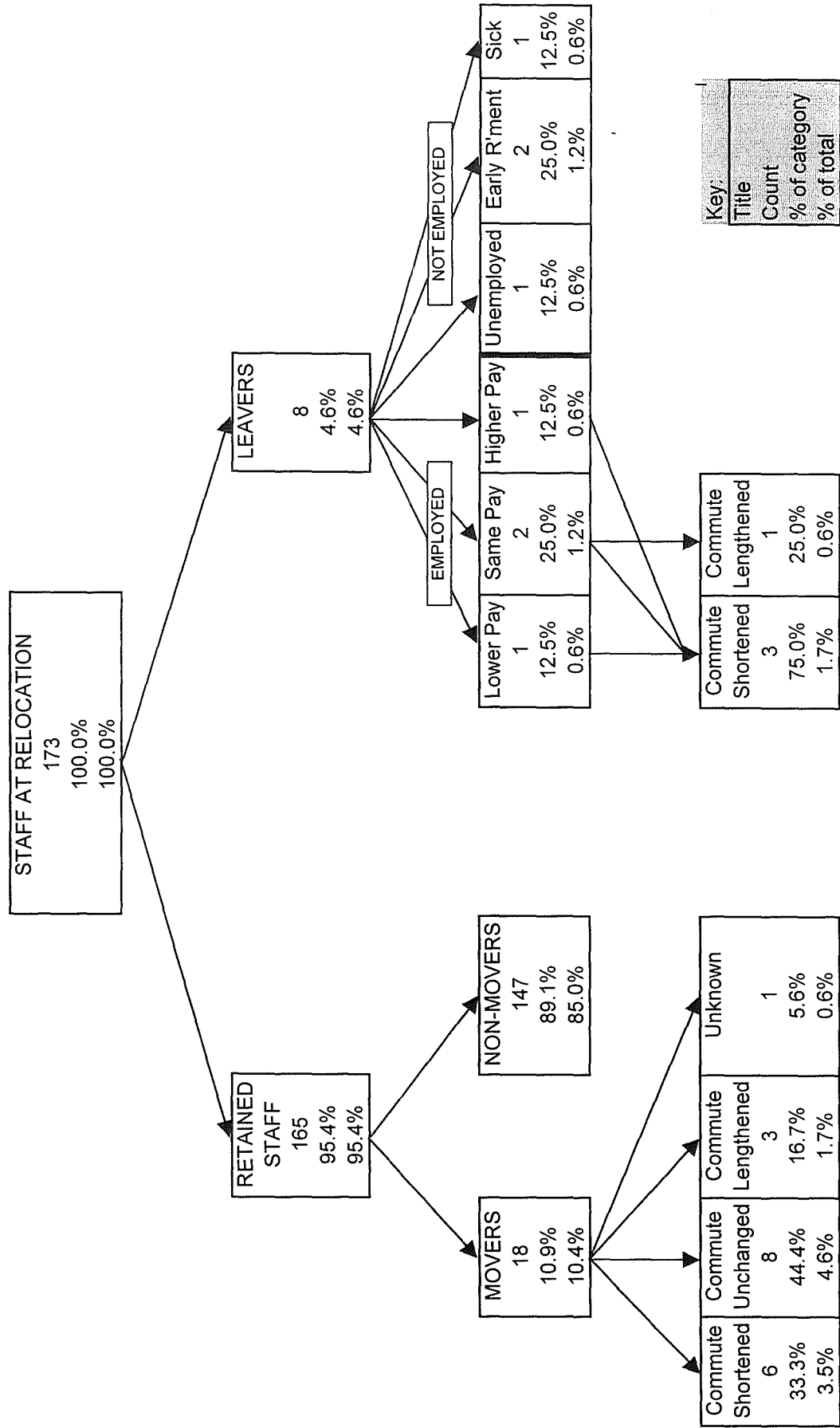
Anecdotally, a senior member of staff from an economic development agency coincidentally told the author that one of the firms in the sample (he did not know that this particular firm was included in this study) had told the economic development agency that they had lost 25% of their staff at the time of their relocation. The same firm when interviewed for this research reported losing around 5% of its employees. The economic development officer suspected that the firm may have been exaggerating its staff loss in order to secure additional training grant. As explained in the previous section, the firms may have understated their staff loss when interviewed for this research in order to appear more socially responsible employers. The estimate of 11.9% compares to 11.3% of black workers quitting their job as the result of a firm relocation of eight miles from central Detroit (Zax and Kain, 1996). These facts suggest that the 11.9% estimated figure is of the correct order of magnitude.

Figure 6.3 shows the estimated numbers of leavers and retained staff alongside movers and non-movers. Overall, it is clear that a significant minority of employees do leave their job because of the relocation.

firm have been excluded from the calculation because using the formula described in the text in these cases produces the anomalous result of estimating a gain of staff specifically as a result of the relocation. This, however, biases the estimation of relocation induced leavers upwards. This estimation procedure is not robust when considered on its own. Rather, it is intended that it is considered alongside that reported by the firms. It is reasonable to suggest that the true number of relocation induced leavers falls somewhere between that reported by the firms themselves and that estimated by this method.

Figure 6.1 Impact of firm relocations - sampled totals

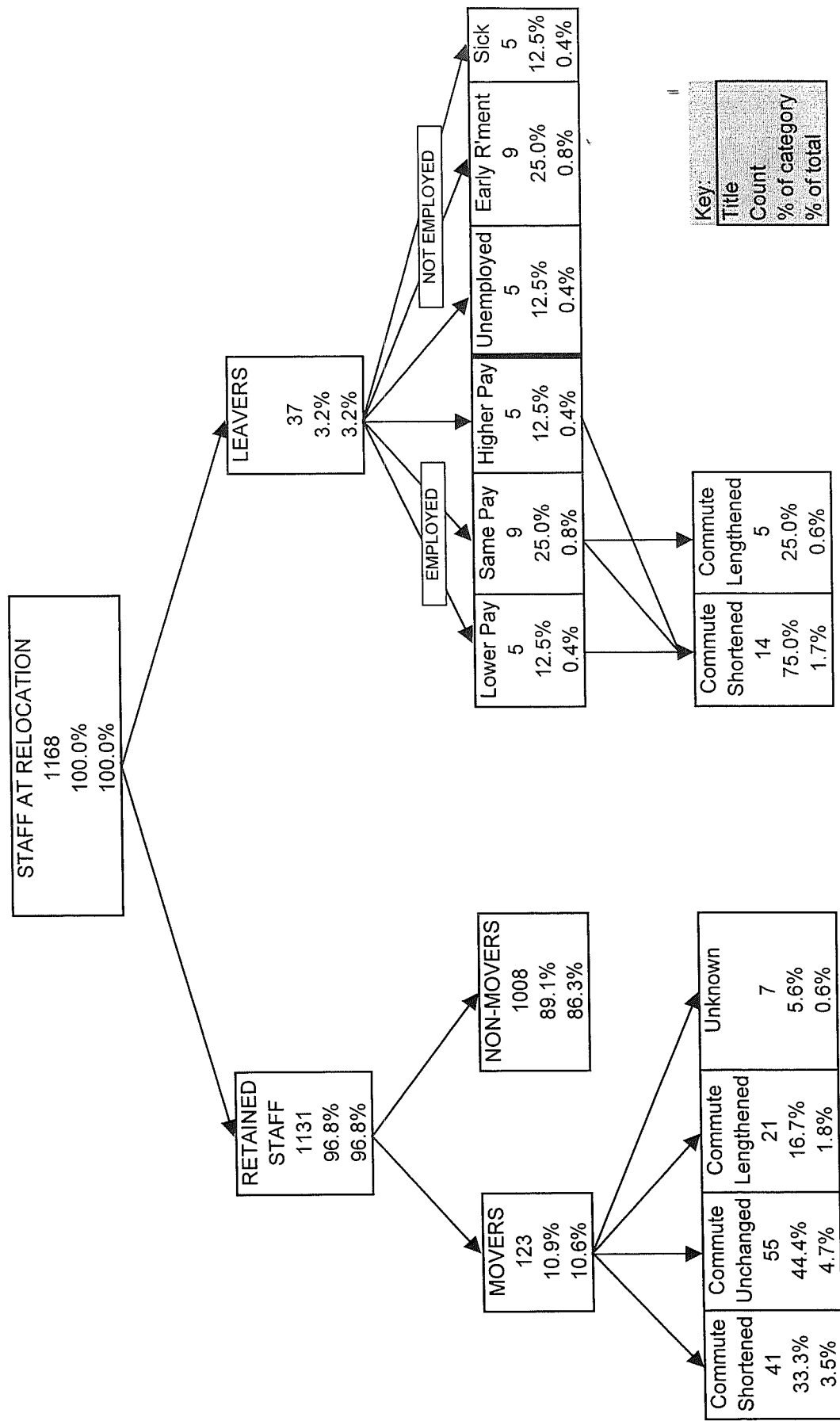
Totals may not sum due to rounding



'Leavers' refers only to those who left because of the relocation
'Movers' refers to those who moved house for any reason

Figure 6.2 Impact of firm relocations - actual totals reported by firms

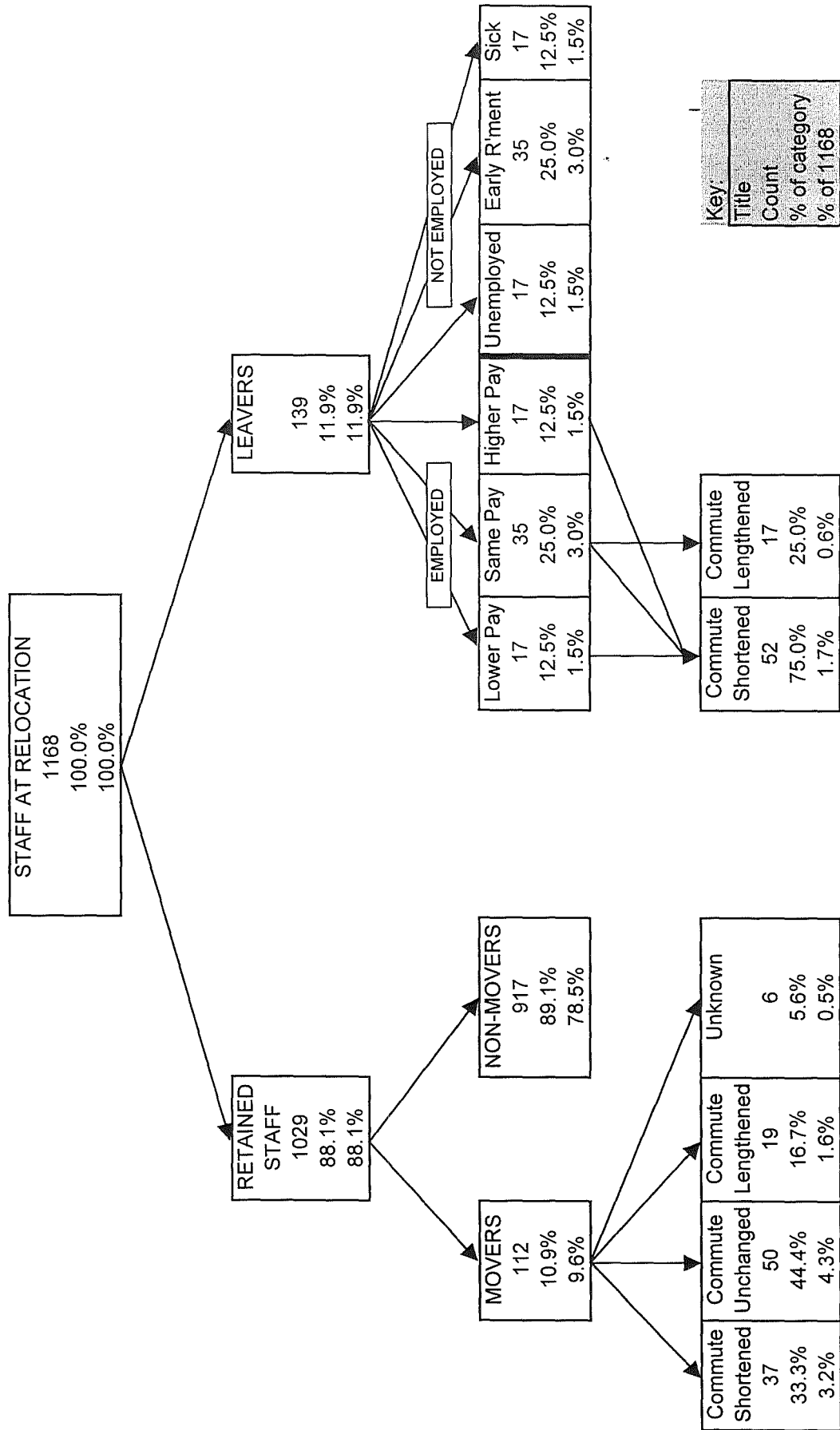
Totals may not sum due to rounding



'Leavers' refers only to those who left because of the relocation
'Movers' refers to those who moved house for any reason

Figure 6.3 Impact of firm relocations - estimated actual totals

Totals may not sum due to rounding



'Leavers' refers only to those who left because of the relocation

'Movers' refers to those who moved house for any reason

It became apparent in the qualitative interviews that travelling by public transport can cause particularly acute commuting problems. For example, in talking about the journey from Bishopbriggs to Tannochside Business Park, a journey of about 10 miles as the crow flies in a non-radial direction with regard to the centre of the Glasgow conurbation, an interviewee stated:

"There are hardly any buses this way; I'd have had to have taken three buses – that could add up to two hours on to each end of your working day and when you're part time it's just not worth it." [female purchase ledger, left for retirement]

With reference to the journey from Rutherglen to Cambuslang Investment Park, a broadly radial but cross-river journey of about three straight-line miles, an interviewee said:

"Well it's 30 minutes' walk to the bus stop here [Cambuslang] and the buses are pretty erratic. Sometimes it's over an hour until you're home." [female sales, retained member of staff]

And, with reference to the journey from Balloch to Bridgeton, approximately 25 miles, linked by a direct train service, an interviewee stated:

"The transportation system is not so good. We don't have an 'integrated transport system'. The travelling at the moment is very tiring. It makes it a long day." [male manufacturing foreman, retained member of staff]

From the quantitative and qualitative data presented, it is clear that some staff leave their jobs because they cannot commute to their employers' new sites. Thus, hypothesis one, *'some staff leave their jobs because of the firm relocations'* can be accepted.

6.2.2 *Hypothesis two: those who leave due to the relocations tend to end up in a weaker economic position*

From the evidence presented so far, a significant minority of people apparently involuntarily leave their job because of an over burdensome commute induced when their job relocates within a metropolitan area the size of the Glasgow conurbation. However, it is important to assess whether or not people who cannot commute to the new sites and leave their job as a result actually end up worse off. It may be the case that they manage to secure equally remunerative alternative employment without an excessively burdensome commute. This is the subject of hypothesis two, *those who leave due to the relocations tend to end up in a weaker economic position*.

Around half of the leavers move into unemployment, early retirement or sickness related benefits as shown in figures, 6.1, 6.2 and 6.3 (although these proportions are based on only the eight sampled leavers). Around half of these people who move out of employment altogether move into early retirement. Therefore, the period for which they are worse off is only that until the date at which they would have otherwise retired, unless they have a contributory or length of service related occupational or private pension, in which case the size of their pension will be reduced in perpetuity. If these individuals had been younger, they may have coped with their longer commute or found alternative employment.

Similarly, those who became unemployed when they leave their jobs because of the firm relocations will not necessarily remain unemployed forever. Sooner or later they are likely to re-enter employment. However, some individuals will remain unemployed for some time and therefore will suffer considerable loss of earnings and associated hardships. The average time between a firm relocating and a leaver being interviewed was 31 months, ranging from 23 to 40 months. Including retained staff and leavers, the surveys and interviews were carried out an average of 23 months after the relocations.

Some of those who move on to sickness related benefits may also have been able to continue working had their employer not relocated. For example, one leaver who moved on to Incapacity Benefit said that she was able to maintain her job at the firm's

previous site because it was close to both her home and the hospital at which she had to attend regular out-patient appointments. This was no longer practical to do during extended work breaks or on the way to or from work, as it had been prior to the relocation. Thus, this individual moved on to Incapacity Benefit as a direct result of her employer relocating and had it not been for this she would still have been in employment. This individual's experience is consistent with arguments made about some of the rise in the numbers of people in receipt of sickness related benefits over the last two decades being 'hidden unemployment' because when people with ailments lose their jobs they tend to claim Incapacity Benefit rather than the less generous and means tested Job Seekers Allowance (Beatty et al, 2000). Another older man who suffered from ill-health but had stayed with his employer after the relocation despite a long commute by train complained that the commuting time at either end of a shift made for a long working day and that he often became extremely tired.

Of the four people who left their jobs because of the firm relocations and had secured alternative employment by the time they were interviewed, two had new commutes which are longer than they had to their previous employers' original locations and were on a similar level of pay; one was on lower pay but partly offset by also having a shorter commute; and one was on higher pay with their commute shortened. Thus, seven of the eight leavers are worse off after their jobs relocated, although this conclusion is based on the fate of only eight leavers, so should be treated with caution. However, this does provide some evidence in support of hypothesis two, *those who leave due to the relocations tend to end up in a weaker economic position.*

6.3 Spatial influences on propensity to leave because of the journey to work

This section provides evidence in relation to hypotheses three and four. These hypotheses, as well as hypotheses one and two reported on so far, relate to the extent to which commuting is a barrier to employment. Thus, they bring further empirical evidence to bear on the first research objective of establishing whether or not commuting is a barrier to employment within metropolitan areas.

6.3.1 Hypothesis three: *those who have, or would have had, the longest (shortest) commutes to the firms' new sites are more (less) likely to leave due to the relocations*

If workers leave their jobs because of difficulties commuting to their employers' new sites after they relocate, then we would expect those faced with the longest commutes to the new sites to be more likely to leave their job because of the journey to work than those with shorter commutes. This forms the basis of hypothesis three. In addition, this provides information on the maximum commute burden people are willing and able to endure. Table 6.1 provides evidence which confirms hypothesis three, '*those who have, or would have had, the longest (shortest) commutes to the firms' new sites are more (less) likely to leave due to the relocations*'.

Table 6.1 Mean commutes to the firms' new sites, by workers' propensity to leave because of the journey to work (generalised minutes)

Leave propensity	<i>n</i>	Car	Public transport	Mode weighted
Not considered leaving because of the JTW*	130	58	139	66
Considered leaving because of the JTW*	31	66	157	89
Left because of the JTW*	7	49	114	106
<i>All staff at the firms' original sites</i>	<i>168</i>	<i>59</i>	<i>141</i>	<i>73</i>

* *Journey To Work*

The column headed 'car' relates to the number of generalised minutes it takes, on average, to travel from workers' homes to the firms' new sites by car. Similarly, the column headed 'public transport' relates to the average generalised journey times when travelling by public transport. The final column headed 'mode weighted' is the average

generalised journey time experienced by people when commuting, taking account of their mode of transport to work.

The 'car' column shows that, if all workers travelled by car, those who left their jobs because of the journey to work would actually have had the shortest commute to the firms' new sites, at 49 generalised minutes compared to 58 experienced by those who have stayed with their employer and have not considered leaving their job because of the journey to work. This apparent paradox indicates that those who left their jobs because of the journey to work actually live geometrically *closer* to the firms' new sites than those who did not consider leaving their job because of the journey to work. The same broad picture is, unsurprisingly, also true of travel by public transport, reflecting the greater geometric proximity to the employers' new sites of those who left their jobs because of the journey to work.

This fact at first sight suggests that hypothesis three should be rejected. However, as explained in the methodology chapter, it is important to consider the mode of transport used by different groups, since public transport is inferior compared to car travel in terms of speed, comfort, reliability and convenience. The mode weighted generalised travel time shows that those who left their jobs because of the journey to work would have had to commute 106 generalised minutes to their employers' new sites compared to only 66 generalised minutes by those who stayed with the firms and have not considered leaving their job because of the journey to work. These figures are striking; the leavers would have commuted some 61% more in generalised time compared to the retained staff who did not consider leaving because of the journey to work. The retained staff who have considered leaving because of the journey to work experience on average a commute of 89 generalised minutes to the firms' new sites, over mid-way between the figures for the other two groups, i.e. closer to the figure for the leavers than for the retained staff who have not considered leaving because of the journey to work. This can be accounted for by the fact that the leavers actually live geometrically closer to the firms' new sites than the retained staff, but, owing to a greater reliance on public transport, experience more difficulty in commuting to those locations.

Note that hypothesis three is accepted when taking account of the mode of travel used, but would have been rejected if travel times or costs relating to only one mode of travel had been used. As differences in travel times or costs relating to one mode only are attributable primarily to differences in distance travelled, any measure of geometric separation between home and workplace (e.g. straight-line distance or road distance) would also lead to a rejection of hypothesis three. The mode weighted generalised time to the firms' new sites for the retained staff who have not considered leaving because of the journey to work is 14% greater than the generalised travel time by car. In contrast, for the leavers it is 116% greater owing to a much greater dependence upon public transport among the leavers. The large magnitude of these differences and the fact that those most adversely affected in the labour market by commuting as a barrier to employment are not those who necessarily live the furthest from suitable job opportunities but those who have least access to private motorised transport, call into question the findings of many previous spatial mismatch studies which have not adequately taken account of the mode of travel of individuals, either in the measurement of the friction of distance or at least as a controlling variable.

Table 6.2 shows that 86% of those who left because of the journey to work travelled by public transport, compared to only 13% of retained staff who have not considered leaving because of the journey to work. This confirms the interpretation above and underlines the importance of access to a private car in being able to sustain awkward or lengthy commutes.

Table 6.2 Propensity to leave because of the journey to work, by mode of transport

Mode of transport	Left because of JTW*		Considered leaving because of JTW*		Not considered leaving because of JTW*	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Car	1	14	24	75	116	87
Public transport	6	86	8	25	18	13
TOTALS:	7	100	32	100	134	100

* *Journey to Work*

Hypothesis three, *'those who have, or would have had, the longest (shortest) commutes to the firms' new sites are more (less) likely to leave due to the relocations'*, can be accepted when using mode weighted generalised travel time. However, it is important to note that those least able to commute to employment opportunities actually need not live geometrically far from those opportunities for commuting to disadvantage them in the labour market, since dependency upon public transport is apparently such a severe handicap in commuting to the new locations of the firms in this study.

6.3.2 *Hypothesis four: those who had, or would have had, their commutes lengthened (shortened) the most are more (less) likely to leave due to the relocations*

Since some groups travel further to work than others, the *changes* induced in individuals' commutes by the firm relocations can be expected to produce a stronger relationship with propensity to leave because of the journey to work than the *total* length of commutes to the firm's new locations, which was reported in the previous section. This is because change in commute induced by the firm relocations reflects the degree of disequilibrium between home and workplace introduced by the firm relocations. Thus, hypothesis four, *'those who had, or would have had, their commutes lengthened (shortened) the most are more (less) likely to leave due to the relocations'*, if accepted, would provide further evidence that there are limits to how far people are willing to commute within metropolitan areas for certain types of jobs. Table 6.3 below reports the relocation induced changes in commuting by propensity to leave because of the journey to work.

Table 6.3 Changes in workers' commutes induced by the firm relocations, by propensity to leave because of the journey to work (generalised minutes)

Leave propensity	<i>n</i>	Car	Public transport	Mode weighted
Not considered leaving because of the JTW*	130	+2.6	+17.0	+3.8
Considered leaving because of the JTW*	31	+30.5	+52.2	+39.1
Left because of the JTW*	7	+37.3	+63.1	+60.8
<i>All workers at the firms' original sites</i>	168	+9.2	+25.4	+12.7

* *Journey To Work*

Overall, workers employed at the firms' original sites had their commutes lengthened on average by 12.7 generalised minutes by the relocations. However, this masks considerable variation, since some people had their commutes shortened while others had their commutes considerably lengthened. The retained staff who have *not* considered leaving their job because of the journey to work had their commutes lengthened on average by only 2.6 generalised minutes by car, while those who *have* considered leaving because of the journey to work to the new sites had their commutes increased by 30.5 generalised minutes compared to 37.3 for those who *actually* left their jobs because of the journey to work to the new sites. For travel by public transport, these figures are 17.0, 52.2 and 63.1 respectively, and taking account of the mode of transport actually used by individuals, these figures are 3.8, 39.1 and 60.8 respectively. The mode weighted figures show, as do the car and public transport generalised travel times, that those who had their commutes lengthened the most by the firm relocations are indeed the most likely to leave their job because of the journey to work. Therefore, hypothesis four can be accepted.

Table 6.4 summarises the outcomes of the testing of each of the four hypotheses in relation to research objective one, 'to establish whether there are commuting constraints within metropolitan areas which cause some people to become unemployed'.

Table 6.4 Summary of outcomes of the testing of hypotheses one to four

Hypothesis	Outcome
<i>H1: some staff leave their jobs because of the firm relocations</i>	Accepted; it is estimated that 6-12% of staff employed at the original locations leave their jobs because of the journey to the firms' new sites.
<i>H2: those who leave due to the relocations tend to end up in a weaker economic position</i>	Accepted; the majority of those who left because of the journey to the new sites ended up in economic inactivity, unemployment or on lower pay.
<i>H3: those who have, or would have had, the longest (shortest) commutes to the firms' new sites are more (less) likely to leave due to the relocations</i>	Accepted; those who had, or would have had, the longest (shortest) commutes to the new sites are more (less) likely to leave, or consider leaving, because of the journey to work.
<i>H4: those who had, or would have had, their commute lengthened (shortened) the most will be more (less) likely to leave due to the relocations</i>	Accepted; there is a strong relationship between the amount individuals had, or would have had, their commutes altered and their likelihood of leaving, or considering leaving, because of the journey to work.

6.4 Non-spatial influences on leave propensity

How important is the journey to work in causing people to leave their jobs in comparison to other factors? This is an important question to answer in order to put in context the analysis presented so far of the influence of spatial factors on the propensity of an individual to leave their job specifically because of the journey to work. By focusing exclusively on commuting as an explanation of people leaving their jobs, it is possible that more significant factors which cause people to leave their jobs have been overlooked. Note that this is included not to provide a comprehensive analysis of the reasons for people leaving their jobs and analysing their 'destinations', but rather to assess the relative importance of commuting as a factor in causing people to leave their jobs in comparison to other factors.

Overall, 45% (112/249) of all workers (retained staff, leavers and new recruits) have left or considered leaving their job for any reason compared to 18% (44/249) specifically because of the journey to work. For the original workforce (retained staff and leavers combined), these figures are 55% (96/173) and 23% (39/173) respectively; while for new recruits they are 21% (16/76) and 7% (5/76) respectively. These figures show that the journey to work is a significant but not dominant reason for people leaving or considering leaving their jobs. In addition, new recruits are less likely overall to consider leaving their job than other staff.

What are the other reasons for people leaving or considering leaving their jobs? These are shown in table 6.5 for the original workforce and new recruits. These two groups have been separated in table 6.5 because members of the original workforce were subject to a 'spatial shock' at the time of relocation, while new recruits were not.

In the questionnaire, respondents were invited to rank their three most important reasons for leaving or considering leaving by writing '1', '2' and '3' against the appropriate reasons. However, many people simply ticked three boxes. Therefore, the three reasons indicated on the forms have been given equal weight in the analysis presented here. Table 6.5 is ranked by the original workforce's reasons for considering leaving in

descending order of importance. The percentages are based on the total number of reasons cited so that they sum to 100%.

Table 6.5 Reasons for leaving or considering leaving, for the original workforce and new recruits

Reason for leaving or considering leaving	Original workforce		New recruits	
	Number of people citing reason	% of reasons cited	Number of people citing reason	% of reasons cited
Poor pay	57	25	9	23
Journey to work	39	17	5	13
Insecurity	36	16	3	8
Poor conditions	35	16	7	18
Change career	32	14	6	15
Personal	9	4	3	8
Shifts	9	4	4	10
Leaving area	7	3	2	5
Care for relatives	1	0	0	0
TOTALS:	225	100	39	100

Poor pay is the top reason for both groups, accounting for around a quarter of responses from both groups. For the original workforce, the journey to work is the second most important reason, with this accounting for 17% of responses from the original workforce. The journey to work is unsurprisingly less important to new recruits, although it still ranks fourth overall for new recruits, accounting for 13% of responses from new recruits. This shows that the journey to work is a significant consideration in people's employment choices.

Another difference between the groups is insecurity which is more important for the original workforce, possibly because new recruits have not been around long enough to witness redundancies or fluctuations in the firm's order book. Personal reasons are

more important for new recruits, possibly because they have had less time to 'fit-in' to the workplace, or they may actually leave if work relationships do not prove to be harmonious after a bedding down period, thus people with these problems are 'missing' from the original workforce sample. Shifts are also more important to new recruits, possibly because they are still adjusting their lifestyle to accommodate their shift patterns, and because people tend to actually leave if they are unable to do so.

The original workers and new recruits have been amalgamated for an analysis of the different reasons for leaving or considering leaving a job for different groups of people with different characteristics. This analysis is important in order to assess whether particular factors in causing people to leave their job are more important to some groups than others. For example, is the journey to work more important relative to other factors in causing manual workers to leave their jobs than other groups?

There is, however, surprisingly little difference between groups of different characteristics in the percentage of them who have considered leaving or have left overall, for any reason. For example, 44% of car drivers (88/199) have considered leaving or have left their job for any reason, almost the same as public transport users at 48% (24/50). All occupational groups (*total n=245*) fall between 43% (skilled manual and non-manual) and 50% (unskilled, but based on only 3 out of 6 respondents), except professionals of whom 71% have considered leaving for any reason although this is based on only seven respondents. 51% (48/95) of women have considered leaving or have left their job for any reason compared to 42% (64/153) of men.

Table 6.6 below shows the relative importance of different leave factors for those who travel to work by car and for those who travel by public transport. This is of interest because of the importance of mode of transport in determining the geometric distance people can travel to work, which was illustrated in the previous section.

Table 6.6 Reason for leaving or considering leaving by mode of transport

Reason for leaving or considering leaving	Car		Public transport	
	Number of people citing reason	% of reasons cited	Number of people citing reason	% of reasons cited
Poor pay	53	25	13	24
Journey to work	29	14	15	27
Insecurity	30	14	9	16
Poor conditions	36	17	6	11
Change career	36	17	2	4
Personal	8	4	4	7
Shifts	10	5	3	6
Leaving area	6	3	3	6
Care for relatives	1	1	.	.
TOTALS:	209	100	55	100

The journey to work is much more significant as a leave factor to those who travel by public transport, representing the inferiority of the mode. Car drivers are much more likely to consider leaving to change career, probably reflecting collinearity with greater skills and career expectations, but also possibly reflecting a greater spatial catchment of commutable jobs available to them. Car drivers are also more likely to consider leaving because of poor conditions, possibly reflecting greater expectations of their employer. Public transport users are more likely to consider leaving for personal reasons. This may be because of collinearity with lower status jobs, the holders of which may be more likely to leave in the face of a personal dispute than the more senior party in the dispute.

Table 6.7 shows the occupational breakdown of reasons cited for leaving or considering leaving. It is based on 253 responses, although only six responses were obtained from unskilled workers and 15 from professionals, therefore these two columns should be treated with particular caution. Consistent with the interpretation above, less skilled workers are more likely to cite personal reasons for leaving or considering leaving. The

journey to work is the most important for skilled non-manual workers, followed closely by unskilled and semi-skilled workers. This possibly reflects the prevalence of women in the skilled non-manual category. Professional and managerial/technical workers are significantly less likely to cite the journey to work as a reason for leaving or considering leaving their job. Professional and managerial/technical workers are more likely to cite insecurity and poor conditions as reasons for considering leaving their job. Skilled manual workers are the most likely to cite shifts as a problem.

Table 6.7 Reason for leaving or considering leaving by occupational group

Reason for leaving or considering leaving	Occupational group											
	<i>Prof=Professional; Man/T=Managerial/technical; SkNMan=Skilled non-manual; SkMan=Skilled manual; Semi=Semi-skilled; Unsk=Unskilled</i>											
	Prof		Man/T		SkNMan		SkMan		Semi		Unsk	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Poor pay	3	20	16	28	22	24	16	29	6	24	1	17
Journey to work	1	7	2	3	24	26	9	16	5	20	1	17
Insecurity	4	27	12	21	14	15	5	9	2	8	1	17
Poor conditions	4	27	13	22	12	13	8	14	4	16	.	.
Change career	2	13	8	14	14	15	7	13	4	16	1	17
Personal	.	.	3	5	4	4	2	4	2	8	1	17
Shifts	1	7	1	2	2	2	7	13	1	4	.	.
Leaving area	0	.	2	3	1	1	2	4	1	4	1	17
Care for relatives	.	.	1	2	.	.	.	.	.	.	.	.
TOTALS:	15	100	58	100	93	100	56	100	25	100	6	100

In conclusion, overall, no particular groups of people are significantly more likely to leave or consider leaving their job for any reason. However, those dependent on public transport and those outside professional and managerial/technical occupations are more likely to cite the journey to work as a reason for leaving or considering leaving their job.

6.5 Who is affected the most by commuting as a barrier to employment?

This section considers what groups of people are more likely than others to leave their job because of the journey to work. This analysis serves three purposes. First, it will aid understanding of the nature of commuting as a barrier to employment: do the findings presented so far apply equally to all groups of people? For example, to what extent does earning a higher wage enable people to commute further? Are manual workers less willing to commute to work? Are tenants in the social rented sector more likely to leave their job for commuting reasons because the option of moving house to shorten their commute is less open to them than owner occupiers and private renters?

The second purpose of this part of the analysis is to highlight which groups face the strongest commuting barriers to employment. Third, in the light of this, policies to help people overcome commuting as a barrier to employment can be better targeted on those groups most adversely affected.

Table 6.8 describes propensity to leave because of the journey to work by occupational group. Previous work has suggested that manual and lower-skilled workers are less willing or able to commute than other workers. We might therefore expect manual and lower-skilled workers to be more likely than other groups to leave their job because of the journey to work when their employer relocates.

Table 6.8 Propensity to leave because of the journey to work by occupational group

Occupational group	Left because of JTW*		Considered leaving because of JTW*		Not considered leaving because of JTW*	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Professional	.	.	1	3	6	5
Managerial/tech	.	.	2	7	42	31
Skilled non-manual	4	57	18	58	50	37
Skilled manual	.	.	7	23	18	13
Semi-skilled	3	43	2	7	17	13
Unskilled	.	.	1	3	1	1
TOTALS:	7	100	31	100	134	100

* *Journey To Work*

People in the professional and managerial/technical groups stand out as having a greater ability to commute. People in the skilled non-manual group have the greatest propensity to both leave and consider leaving their job because of the journey to work. This may be due to three factors: first, jobs in the skilled non-manual category are generally fairly low-paid (the skilled manual category contains some higher paid manufacturing jobs and the unskilled category may provide opportunities for overtime) although this is based on only seven observations; second, these jobs are often taken by women who have been previously found to commute less far than men; and third, there may be more alternative job opportunities available closer to home for skilled non-manual workers as the overall demand for white collar jobs has not declined in the City of Glasgow to the same extent as it has for blue-collar jobs. Members of the skilled manual category have a high propensity to consider leaving because of the journey to work although none of the leavers actually fall into this category. People in the unskilled category (almost exclusively manual jobs) have a high propensity to leave because of the journey to work. Therefore, there is some evidence that manual workers are more adversely affected by commuting barriers than other groups, although the same applies to a slightly lesser extent to workers in the skilled non-manual category.

Previous work has clearly demonstrated the correlation between earnings and distance commuted (for example, see Gabriel and Rosenthal, 1996). Therefore, we would expect higher income workers to be less likely to leave their job because of the journey to work when their employer relocates. Propensity to leave because of the journey to work by income is shown in table 6.9 below.

Those who left because of the journey to work are heavily skewed towards low incomes but do not include those on very low pay. This may be because those on very low pay cannot afford to leave their job and are weakly positioned in terms of skills to obtain alternative employment. Those who have not considered leaving are skewed towards higher incomes when compared to the other two groups.

Table 6.9 Propensity to leave because of the journey to work by income

Annual Gross Income	Left because of JTW*		Considered leaving because of JTW*		Not considered leaving because of JTW*	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
<£5000	.	.	.	.	.	.
£5000-£7499	.	.	2	8	2	2
£7500-£9999	4	57	4	15	7	7
£10000-£12499	3	43	7	27	27	26
£12500-£14999	.	.	6	23	11	11
£15000-£19999	.	.	6	23	24	23
£20000-£24999	.	.	.	.	20	19
>£24999	.	.	1	4	14	13
TOTALS:	7	100	26	100	105	100

* *Journey To Work*

However, in some instances, high income earners may wish to shorten their commute. In one case where a male quantity surveyor in his late 30s travelled between Alexandria and Tannochside by car (a lengthy cross city centre commute), he stated that, although he would not move from Alexandria because of family there, he was actively looking for work closer to home because of commuting time. With his present commute, he sees very little of his young children through the week. He said that flexitime at work would be a significant help, even only 15 minutes to miss the worst of the peak hour traffic congestion.

Commuting propensity studies have consistently shown that women commute shorter distances than men. We would therefore expect women to be more likely than men to leave their job because of the journey to work when their employer relocates. Table 6.10 below shows propensity to leave because of the journey to work by gender.

Table 6.10 Propensity to leave because of the journey to work by gender

Gender	Left because of JTW*		Considered leaving because of JTW*		Not considered leaving because of JTW*	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Male	2	29	14	44	84	63
Female	5	71	18	56	49	37
TOTALS:	7	100	32	100	133	100

* *Journey To Work*

Table 6.10 shows that women are much more likely to leave their job because of the journey to work than men, and are significantly more likely to consider doing so. Multi-variate analysis reported later shows that this is likely to be primarily due to women's greater dependence on public transport and lower pay rather than gender *per se*. The interaction between gender and mode of travel was captured by this female leaver who had re-entered employment since leaving her former employer:

"Well, I'm actually travelling further than it would have been to xxx the now, but I get a lift from my husband. It's a nine o'clock start, so it works out well with the shifts. But Coatbridge, that's completely the wrong direction for him, so he couldn't have taken me there. So, it just depends on the buses. Where I am just now is an hour by bus, ten minutes in the car. I need two buses to get there." [female electronics assembly leaver]

A female member of retained staff working in finance stated that when her daughter started school she had to start driving because she had to drop her daughter off on the way to work. Otherwise, she would commute by train. Her sister looks after her daughter after school.

Previous research has shown that those who live in social rented accommodation have lower labour mobility than workers in other tenures. However, most of this work has related to inter-regional migration rather than migration within a metropolitan area. Table 6.11 below reports propensity to leave because of the journey to work by housing tenure. It could be expected to be greater, *ceteris paribus*, since the option of shortening

an unmanageable commute by moving house is less open to people in social rented accommodation than in other housing tenures.

Table 6.11 Propensity to leave because of the journey to work by housing tenure

Housing tenure	Left because of JTW*		Considered leaving because of JTW*		Not considered leaving because of JTW*	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Local authority	2	29	2	7	12	9
Housing Ass.	1	14	4	13	6	5
Scottish Homes	.	.	.	.	2	2
Private rented	.	.	.	.	1	1
Owner occupier	4	57	26	81	113	84
TOTALS:	7	100	32	100	134	100

* *Journey To Work*

Confirming this expectation, those who left their job because of the journey to work are indeed more likely to be in the social rented sector, particularly council properties, than those who have not. In addition to having less option to move, this is likely to be partly explained by collinearity between being in the social rented sector and working in manual, lower-paid and lower-skilled employment. The figure for council tenants considering leaving because of the journey to work is, however, slightly less than that for those who have not, at seven per cent compared to nine per cent.

Some people may be in greater need of remaining in their job than others, despite a long commute. This will be contingent upon the extent to which they depend upon their income. This is likely to be in turn influenced by their household position. A sole earner with a partner, for example, may be less likely to be in a position to leave their job than someone else less dependent on their income such as a secondary earner with a working partner. The propensity of people in different household or situations to leave their job because of the journey to work is shown in table 6.12.

Table 6.12 Propensity to leave because of the journey to work by household situation

Household situation	Left because of JTW*		Considered leaving because of JTW*		Not considered leaving because of JTW*	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Primary earner	1	14	9	28	49	38
Secondary earner	2	29	12	38	20	15
Sole earner with partner	1	14	3	9	22	17
Lives on own	1	14	5	16	16	12
Single parent	.	.	.	.	7	5
Lives with parents	2	29	3	9	16	12
TOTALS:	7	100	32	100	134	100

* *Journey To Work*

Primary earners are less likely to leave or consider leaving because of the journey to work than secondary earners. This may be because of three factors: first, they are more likely to be on a higher income so can support a longer commute; second, households have more income to lose if a primary earner leaves their job than if a secondary earner leaves a job; and third, secondary earners may be more likely to be dependent on public transport. Those who live with their parents are also more likely to leave their job because of the journey to work – this may be related to their age, income, mode of transport and having the security of a family home to fall back on should they leave their job. No single parents have left their job or considered leaving their job because of the journey to work which is surprising in the face of previous work which has shown single parents to face difficulties with regards to the journey to work (Hine and Mitchell, 2001), although the finding here is only based on seven individuals. The explanation may lie in the fact that single parents who have entered employment in the first instance may have friends or relatives who can provide childcare or other support.

Household income may influence an individual's propensity to leave their job because if the household is less dependent on the individual's income then that individual will be more likely to leave their job than a similar individual who was, for example, the sole

earner in their household. The same analysis as reported previously for *individual* income was performed for *household* income. This revealed that individuals in higher income households are less likely to leave or consider leaving their job because of the journey to work. This is consistent with the greater propensity reported earlier for secondary earners to leave compared to primary earners. There will, however, of course, be a high degree of collinearity between household income and individual income since the latter is included within the former.

Age may also influence a person's degree of dependence on their income. Older workers can be expected to be more likely to leave their job because of the journey to work when their employer relocates because they may have the option of taking early retirement. In addition, if older workers have invested in the home in which they live then they may be less likely to be willing to move house to circumvent the need to change jobs compared to younger workers. Counter to this, however, older workers may also be more settled with their employer, so be more reluctant to leave their job. Similarly, younger workers under 25 or so can also be expected to be more likely to leave their job because of the journey to work due to being on lower pay, being more likely to be dependent on public transport and possibly being less established in a particular career so therefore be more willing to change employer and occupation. Table 6.13 below shows propensity to leave because of the journey to work by age group.

Leavers are all either under 30 years old or over 45 years old, suggesting the scenario sketched above may be correct. Younger leavers may not only have not developed commitment to a particular career but may not have yet developed commitment or attachment to a particular employer.

Table 6.13 Propensity to leave because of the journey to work by age band

Age band	Left because of JTW*		Considered leaving because of JTW*		Not considered leaving because of JTW*	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
<20	1	14	.	.	.	.
20-24	1	14	1	3	8	6
25-29	2	29	5	16	34	26
30-34	.	.	4	13	20	15
35-39	.	.	7	22	15	11
40-44	.	.	5	16	17	13
45-49	1	14	3	9	9	7
50-54	1	14	5	16	14	11
55-59	.	.	2	6	9	7
>59	1	14	.	.	6	5
TOTALS:	7	100	32	100	132	100

*Journey To Work

The option of early retirement open to older workers was mentioned in some of the qualitative interviews. However, people weighed this against the security of remaining with their employer if they had been with the same firm for a long time. For example:

"I've worked here for 38 years so I'm not leaving now, even though the buses here take me an hour. I'll probably retire soon though; maybe five years before my time, but I won't get a job anywhere else, not at my age."
[Older female, member of retained staff]

If this member of retained staff does indeed retire "five years before [her] time", then she will have become a leaver because of her employers' relocation, but not until some point in the future. This illustrates that some individuals may be able to bear a long commute for a certain period of time but are unable to sustain it indefinitely.

An individual's level of attachment to their employer is also likely to influence their likelihood of leaving their job for any reason, including the journey to work.

'Attachment' to an employer is likely to be correlated with an individual's length of service with an employer. Indeed, leavers' average length of service is only 20 months, compared to 120 months (10 years) for those who have not considered leaving because of the journey to work. However, there is less difference between the median length of service of retained staff who had, and those who had not, left or considered leaving because of the journey to work, with these being 78 and 76 months respectively (the means were 120 and 101 months, based on 39 and 132 observations respectively). Since there is little difference in the medians but some difference in the means, this suggests that only employees with very long service with a firm have lower propensity to leave because of the journey to work, although this is based on a relatively small sample.

6.5.1 Multi-variate analysis of propensity to leave because of the journey to work

Many of the characteristics outlined above are related to each other. For example, manual workers are more likely to live in social rented accommodation, and younger people and women are more likely to commute by public transport. However, we need to know the impact of each, *ceteris paribus*, on people's propensity to leave their job because of the journey to work in order to assess the significance of each. For this reason, multi-variate analysis needs to be carried out in order to fully explain the determinants of people's propensity to leave their job because their employer relocates.

In addition, it is important to assess the importance of firm relocations in comparison to the importance of people's characteristics in determining their propensity to leave their job because of the journey to work. This puts the hypothesis tests reported earlier into fuller context. It was decided to use multiple logistic regression in order to calibrate a multi-variate model to explain the relative importance of different spatial and non-spatial factors in determining the probability of a particular individual leaving their job because of the journey to work.

Logistic regression calculates the probability (a value between 0 and 1) of either leaving or considering leaving a job because of the journey to work based on an individual's characteristics. Because only seven people in the sample left their job because of the

journey to work, they were modelled together with those who considered doing so to yield a variable that reflects leave propensity (see section 5.4.8.2 for a discussion of the validity of this). Logistic regression uses a binary (0 or 1) dependent variable from which to calculate the impact which different explanatory variables have on the probability of the dependent variable being one rather than zero. In this case, a value of zero reflects retained staff who have *not* considered leaving because of the journey to work, and a value of one reflects staff who *have* left or considered leaving because of the journey to work. Logistic regression makes no assumptions about the distribution of data.

Before calibrating multiple logistic regression models, a series of uni-variate logistic regressions were performed. These uni-variate logistic regressions allow the stability of the coefficients to be assessed when calibrating a multi-variate model. In the interests of space and clarity, only those with a relationship with propensity to leave because of the journey to work which is statistically significant at greater than the 50% level²² have been reported in table 6.14 and taken forward into the multi-variate analysis. The highly insignificant variables which have been excluded are: the presence of children under 16 years of age in the household; the age of the worker; and the length of service with the firm.

First, the reader is talked through the meaning of the columns in table 6.14. *Beta* is the coefficient calibrated on each variable and *SE Beta* is its standard error which is used in the calculation of the variable's significance. *Significance* refers to the probability that the relationship is entirely due to chance, in other words values close to zero reflect relationships that are highly statistically significant (for example, .0100 corresponds to 99% confidence that the relationship is *not* due to chance alone). *R* is the partial correlation between the independent and dependent variables. Partial correlation refers to the correlation between the independent and dependent variable after controlling for

²² Housing tenure has been included although it falls marginally outwith the 50% significance threshold, since it has been shown by previous work to be associated with restricted labour migration, at least in relation to inter-regional migration. By possibly reducing the ability of people to move house to be within commuting range of their relocated jobs, social housing can be hypothesised to be correlated with propensity to leave because of the journey to work (since this is an alternative course of action open to the individual who is unable to move house in response to commuting difficulties).

the effect of the other independent variables in the model. *Exp (Beta)* is the base of natural logarithms raised to the power of beta. This converts the coefficient beta to a linear elasticity and represents the change in the dependent variable accompanying a unit change in the independent variable.

-2 Log Likelihood is a goodness of fit measure for the overall equation and is based on the probability of the sample occurring under the estimated model. The *lower* this number, the *better* the fit of the model. Although relatively meaningless on its own, this number allows accurate comparisons between models to be made. *Pseudo R-square* represents the proportion of the variation in the dependent variable which has been accounted for by the model. R-square as calculated for linear regression cannot be calculated for logistic regressions, hence the pseudo R-square. Note that pseudo R-squares may not always provide an accurate measure of the proportion of variation in the dependent variable accounted for by the model, therefore they should be interpreted with caution. The Cox and Snell pseudo R-square has been used throughout. Since *-2 Log Likelihood* and *Pseudo R-square* refer to the overall model rather than a specific variable, in the case of multiple logistic regression results which are reported later, only one value appears at the foot of these columns in table 6.14.

The variables which appear in table 6.14 are listed on the following page. Each categorical variable has a series of dummy variables coded as zeros or ones. When logistic regression is performed, the coefficient on each dummy variable is calculated in relation to the difference that category introduces to the dependent variable in comparison to a reference category. Each category used as the reference category in the logistic regressions for each categorical variable is indicated by square brackets [].

Dependent variable:

Leave propensity (left or considered leaving because of the JTW; 0=no, 1=yes)

Independent variables:

CCO – Change in commute induced by the firms' relocations (mode specific generalised time)

PT – Public transport dummy (0=car, 1=PT)

PRO – Professional dummy (0=no, 1=yes)

MN – Managerial/technical dummy (0=no, 1=yes)

SN – Skilled non-manual dummy (0=no, 1=yes)

SM – Skilled manual dummy (0=no, 1=yes)

SEM – Semi-skilled dummy (0=no, 1=yes)

[UNS – Unskilled dummy (0=no, 1=yes)]

[OO – Owner occupier dummy (0=no, 1=yes)]

LA – Local Authority tenant dummy (0=no, 1=yes)

HA – Housing Association tenant dummy (0=no, 1=yes)

SP – Single parent dummy (0=no, 1=yes)

SOL – Sole earner with partner dummy (0=no, 1=yes)

[OW – Lives on own dummy (0=no, 1=yes)]

PRI – Primary earner dummy (0=no, 1=yes)

SEC – Secondary earner dummy (0=no, 1=yes)

PAR – Lives with parents dummy (0=no, 1=yes)

FEM – Female dummy (0=male, 1=female)

INC – Income scale

HIN – Household income scale

Table 6.14 Uni-variate logistic regression models of leave propensity

Variable	Beta	SE Beta	Signif	R	Exp (Beta)	-2 Log Likelihood	Pseudo R-square
CCO	.0352	.0076	<.0000	.3311	1.0359		<i>n</i> =168
Constant	-2.0737	.3129	<.0000			145.253	.185
PT	1.2833	.4190	.0022	.1999	3.6086		<i>n</i> =173
Constant	-1.5346	.2205	<.0000			175.634	.051
Occ. group			.0881	<.0000			<i>n</i> =172
PRO	-1.7918	1.7795	.3140	<.0000	.1667		
MN	-3.0420	1.5883	.0555	-.0958	.0477		
SN	-.8210	1.4372	.5678	<.0000	.4400		
SM	-.9445	1.4827	.5241	<.0000	.3889		
SEM	-1.2238	1.5029	.4155	<.0000	.2941		
Constant	<.0000	1.4142	>.9999			166.648	.084
Housing tenure			.5069	<.0000			<i>n</i> =173
LA	.2276	.6128	.7104	<.0000	1.2556		
HA	1.1439	.6394	.0736	.0806	3.1389		
Constant	-1.3262	.2054	<.0000			180.069	.026
Household situation			.1592	<.0000			<i>n</i> =169
SP	-7.2216	22.8458	.7519	<.0000	.0007		
SOL	-.7239	.7243	.3176	<.0000	.4848		
PRI	-.6084	.5912	.3035	<.0000	.5442		
SEC	.6242	.5921	.2918	<.0000	1.8667		
PAR	-.1823	.7012	.7949	<.0000	.8333		
Constant	-.9808	.4787	.0405	<.0000		170.932	.067
FEM	.9017	.3719	.0153	.1451	2.4637		<i>n</i> =172
Constant	-1.6580	.2728	<.0000			178.143	.034
INC	-.5367	.1476	.0003	-.2718	.5847		<i>n</i> =138
Constant	1.4764	.7103	.0377			135.924	.109
HIN	-.1722	.0931	.0643	-.1014	.8418		<i>n</i> =126
Constant	.0956	.6892	.8897			134.567	.029

The change in commute induced by the firms' relocations and income are both highly statistically significant and explain 19% and 11% respectively of the variation in propensity to leave because of the journey to work. However, bear in mind that the change in commute measure is specific to the mode of travel used by each individual, so not only reflects physical distance but also individuals' mode of travel. Despite this, the public transport dummy on its own is significant at the 99% level, underlining the importance of access to a car in order to sustain commutes to the firms' new locations. Gender is significant at the 98% level. Interestingly, the change in commute has the highest pseudo R-square but household income has the best overall goodness of fit statistic but with a fairly low pseudo R-square. The income goodness of fit is only marginally worse than household income but has a much higher pseudo R-square.

The occupational group dummies have been defined with reference to the unskilled category. This means, for example, that members of the semi-skilled group are 1.2941 times less likely to leave because of the journey to work compared to members of the unskilled group. Interestingly, the skilled non-manual and the skilled manual groups have smaller coefficients than the semi-skilled category. This may be because there are more job opportunities available to more skilled workers. The top two groups, particularly managerial/technical workers, are much less likely to leave because of the journey to work than unskilled workers. This is probably because commuting longer distances is less of a problem to them because of higher pay and higher car ownership. However, none of the occupational group dummies on their own are statistically significant at the 95% level.

The housing tenure dummies have been coded with reference to owner occupiers. Again, none is statistically significant. The household situation dummies have been coded with reference to those who live on their own. The signs are as expected, but none is statistically significant. 'Secondary earners' is the only category to be more likely to leave because of the journey to work than those who live on their own, as suggested in the discussion in the previous section. The age dummies have not been reported in the table above in the interests of space and because they were all highly statistically insignificant (although collectively were significant at above the 50% level).

Those variables with significance statistics of $<.25$ were included in forward stepwise multiple logistic regression. This is a procedure whereby the best single variable is used, then the best pair including this variable, and so on. This is carried on until the significance of the model cannot be improved by either removing or including any variables. The results of this are reported in table 6.15.

Table 6.15 Forward stepwise multiple logistic regression leave propensity model,
n=118

Variable	Beta	SE Beta	Signif	R	Exp (Beta)	-2 Log Likelihood	Pseudo R-square
CCO	.0424	.0117	.0003	.2918	1.0433		
FEM	1.6583	.6924	.0166	.1685	5.2504		
Occ. group			.1198	<.0000			
PRO	-7.9078	28.1561	.7788	<.0000	.0004		
MN	-2.6403	1.8545	.1545	-.0143	.0713		
SN	-.7174	1.5175	.6364	<.0000	.4880		
SM	.9395	1.7171	.5843	<.0000	2.5586		
SEM	-1.2797	1.6182	.4290	<.0000	.2781		
Constant	-2.3366	1.6333	.1525			87.135	.314

As can be seen, the change in commute induced by the firm relocations, gender and occupational group have the strongest influence, *ceteris paribus*, on people's propensity to leave because of the journey to work in the face of their job relocating. CCO is highly significant, FEM is significant at the 98% level, but none of the occupational group dummies is significant. Bear in mind that the change in commute is measured in generalised minutes specific to different modes of travel, therefore captures the effects of both geometric distance and mode of travel to work. The coefficient on PRO is unstable compared to its uni-variate counterpart, and the sign on the skilled manual dummy has changed. This changing of sign may not be due to an aberration, but to the fact that gender is being controlled for and there is a strong negative relationship between being female and being in manual employment. The positive coefficient on the

skilled-manual category in table 6.15 is consistent with previous work which has shown that manual workers commute shorter distances than other workers.

Interestingly, income, which had a strong uni-variate relationship with leave propensity, is omitted in the final model produced by forward stepwise multiple logistic regression. This may be because it is collinear with occupational group.

In order to increase the degrees of freedom, CCO and INC were combined. This was done by expressing the ratio between change in commute and income (CCO/INC), in order to reflect the fact that higher income groups commute further. The variables were entered again using the forward stepwise procedure. The best fit was obtained with CCO/INC and household situation with a -2 Log Likelihood of 96.705 and a pseudo R-square of .311, a worse overall performance than that produced by the model reported in table 6.15. Occupational group was most probably omitted in this model specification because it is collinear with income.

Because of the small sample size, the stepwise procedure produces a model with only two or three variables included. In order to gain some information on the relative importance of the variables in determining leave propensity, they were all entered together in the first block of logistic regression. The problem with this was that all variables, apart from the change in commute and gender, were highly insignificant. Therefore, a backward stepwise procedure was used which starts with all variables entered on block one. The best fit obtained by this procedure was obtained with change in commute, occupational group and household situation. However, most of the dummies were highly insignificant with the exceptions of managerial/technical and primary earner, both of which nearly reached the 90% level and had a negative relationship with propensity to leave because of the journey to work. The overall -2 Log Likelihood was 91.160, a slightly worse fit than the forward stepwise procedure, but the pseudo R-square was .340, slightly higher.

The first variable to be removed in the backwards stepwise procedure is income, followed by gender, followed by mode of travel. It is interesting that income and

gender have strong simple uni-variate relationships with leave propensity but when other factors are controlled for appear not to be significant. This suggests that they do not influence leave propensity directly but proxy for other characteristics and processes affecting people's attachment to their job and ability to commute. Bear in mind, however, that 'change in commute' includes the effect of mode of travel which is a strong determinant of propensity to leave because of the journey to work, as explained previously. Because of the interactions between occupational group and income, and between secondary earners and women, these variables were combined multiplicatively for one final model specification. This improved the -2 Log Likelihood slightly but did not quite reach that in table 6.15, but the pseudo R-square increased to .347. This suggests that there is a reinforcing interaction between gender and household situation, and between occupational group and income in determining propensity to leave employment because of the journey to work.

What is clear is that secondary earners and members of lower occupational groups are more likely to leave their job because of the journey to work, particularly if their commute is long. The 'length' or 'cost' of commuting is in large part determined by mode of travel. Thus, those dependent on public transport, women and lower-skilled workers have difficulty commuting to the industrial estates to which most of the firms in this study moved.

6.5.2 Leave propensity by firm

It is possible that leave propensity varies depending on the nature of the different firms as employers, i.e. because some employers are more attractive to work for than others. However, this potential methodological problem is mitigated by the fact that this analysis has been modelling the factors which influence individuals' propensity to leave their job specifically because of the journey to work rather than for any reason which may include factors relating to the terms and conditions offered by each firm.

Overall, 45% (112 out of 249) of respondents have left or considered leaving their job *for any reason*. Excluding firms with less than ten respondents, this varied from 8% (1/12) in one firm to 70% (21/30) in another. Five of these 12 firms lie within ten

percentage points either side of the mean. Uni-variate logistic regression was performed on propensity to leave or consider leaving their job for any reason with dummies coded for the 16 different firms in the sample. The overall significance of the firm dummies was 0.0191 (nearly 98% confidence) but only three firms had partial correlation coefficients different from zero.

This, however, does not take account of the fact that the characteristics of the firms employees are different, and so may have different propensities to leave their job based on their own characteristics rather than those of their employer. Therefore, multiple logistic regression was carried out using dummies for firm, socio-economic group, household situation, age, and continuous variables for length of service and change in commute induced by the firm relocation. This leaves 233 cases in the analysis. The overall significance of the firm dummies fell to marginally over 95%, but again significant differences were restricted to the same three firms as previously.

However, this analysis has modelled propensity to leave because of the journey to work. When this is compared across firms, the significance of different employers is much less. Indeed, once controlling for differences in the change in commute induced by the different firms' relocations, the firm variable is highly insignificant. In total, 18% (45/249) of all respondents had left or considered leaving because of the journey to work. Excluding firms with less than ten respondents, this varied from 0% (0/26) in one firm to 23.5% in two others (4/13 and 8/26). Six of these 12 firms lie within five percentage points either side of the mean. Uni-variate logistic regression showed that the firm dummies are highly *insignificant* at 0.9163 (nearly 92% confident that the relationship is spurious) and no firm had a partial correlation coefficient different from zero. When relocation induced change in commute and the other characteristics variables are controlled for, the overall significance of the firm dummies falls further to 0.9866. Unsurprisingly, the change in commute variable is highly significant (<.0000) and has by far the highest partial correlation coefficient (.2851, the next greatest difference from zero being the overall effect of occupational group at .1061). This negligible effect of different employers on propensities to leave because of the journey to work validates the amalgamation of firms in the previous analysis.

6.6 Transportation and travel impacts of the firm relocations

This section briefly considers the transportation impacts in terms of modal shift and the travel impacts on individuals of the firm relocations. This is broadly a picture of shift from public transport to car, and of difficulties with activity scheduling, i.e. people find it more difficult to do shopping and access banks etc. during meal breaks or on the way to or from work from the firms' new sites compared to the old ones. This reflects the general movement of firms to suburban locations less well served by public transport, as shown in tables 5.3 and 5.4 in the previous chapter.

The transportation consequences of the relocations in terms of mode of travel are shown in table 6.16 below. The modal composition of retained staff's travel to the old sites compared to their mode of travel to the new sites illustrates the immediate impact on the workforce in terms of mode choice. The mode choice of those recruited at the new sites reflects the long-term impact on the modal share of commuting trips of the changing spatial distribution of employment more generally.

Table 6.16 Impact on mode of travel to work of the firm relocations

Mode of travel	Retained staff to old site		Retained staff to new site		New recruits	
	<i>n</i>	%*	<i>n</i>	%*	<i>n</i>	%*
Car driver	120	61	140	71	58	64
Car passenger	15	8	30	15	13	14
Bus	27	14	12	6	7	8
Train	21	11	2	1	6	7
Walk	9	5	7	4	1	1
Bicycle	4	2	3	2	2	2
Motorbike	.	.	.	.	1	1
Taxi	.	.	2	1	2	2
TOTALS:	196	100	196	100	90	100

* Respondents were invited to 'please tick as many boxes as apply, but omit boxes which apply less than once a fortnight' in order to capture multi-modal trips and people who vary their mode of travel to work. The numbers and percentages in this table refer to responses rather than respondents.

A comparison of retained staff's modal share to the old sites and retained staff's modal share to the new sites gives a measure of the modal shift induced directly by the firm relocations. This is a strong movement towards driving a car to work. Many people share a lift with work colleagues. Surprisingly, new recruits are nearly as likely to lift-share as retained staff to the new site. This is surprising because the qualitative interviews indicated that retained staff often were arranging lifts with people they have worked with for a long time. It may be that the retained staff at the new sites are willing to give new recruits a lift, since they are aware of the difficulties of travelling to the site. However, the qualitative interviews indicated that new recruits' lifts often did not come from work colleagues but from family members. This may be because new recruits have had less time to make arrangements for the journey to work. Indeed, many indicated that they were saving to purchase a car. Bus and rail patronage to the new sites are substantially reduced in comparison to commuting to the old sites. If the firms' destinations are typical of the public transport accessibility of areas of employment growth generally, then this will have serious implications for commuting patronage on public transport services in the long-term.

Interviewees reported lift-sharing arrangements with family who live nearby or on the route to their own work. This appears to work fairly smoothly. However, lift-sharing with work colleagues was less satisfactory and often led to logistical problems. For example, holiday and sickness leave meant alternative arrangements had to be made at short notice. Also, lift-share arrangements require people to leave the workplace at the same time. Particularly with office based employment, this was a common problem for lift-share arrangements. Lift-sharing can be effective in raising the average car occupancy in transporting a firm's employees to work *overall*, which is desirable on environmental grounds, but it is not sufficiently reliable for people without access to their own car to rely upon, as there will inevitably be days on which a lift is unavailable.

Some interviewees reported frustration at the lack of amenities at the new sites, particularly retail banks. Some reported taking annual leave in order to access such services.

6.7 Summary and conclusions

Overall, it is likely that 6-12% of staff left their jobs because they could not commute to the new sites, illustrating that some people face commuting constraints of such a magnitude that force them to leave their job. Of those who leave their job, approximately half had not re-entered employment after an average adjustment period of 31 months since the firm relocations. This allows hypotheses one – *some staff leave their jobs because of the firm relocations*, and hypothesis two – *those who leave due to the relocations tend to end up in a weaker economic position*, to be accepted. A key implication of the findings is that continued employment deconcentration within the Glasgow conurbation will cause economic hardship to some groups, particularly residents of Glasgow City. It would have been useful to follow leavers for some time to be able to assess the length of time for which they are disadvantaged by the firm relocations. In the context of employment deconcentration and decline outstripping that of population in the Glasgow conurbation, this is likely to mean that some residents of the core are unable to take-up paid work due to the unviability of commuting to suitable employment opportunities in the ring.

People who had the longest commutes (hypothesis three) and those who had their commutes lengthened the most by the firm relocations (hypothesis four) are more likely to leave or consider leaving their job because of the journey to work to the firms' new sites. However, the people most at risk of leaving or considering leaving their jobs because of the journey to work are not actually those who are the furthest removed geometrically from the firms' new locations. Because they are much more dependent on public transport, people with higher propensity to leave their job because of the journey to work face, or would have faced, more difficult commutes when measured in generalised travel time.

In terms of understanding the spatial distribution of unemployment within metropolitan areas, it is clear that areas with low car ownership rates are therefore likely to experience higher unemployment as a result of restricted geographical commuting catchments open to public transport dependent residents. Conversely, however, it is also likely to be the case that high rates of unemployment in certain neighbourhoods will prevent people

from purchasing cars. If an individual was able to secure a job paying a wage which could support car ownership, then they may tolerate a difficult commute by public transport or 'lift-share' arrangement until such a time they saved enough to purchase and run a car. However, if an individual is unable to secure a job which pays much more than the minimum wage, for example owing to limited skills then they are unlikely to accept a job to which they feel they could not reasonably sustain a commute by public transport for a long period of time. This feeling may be reinforced if they would be unwilling or unable to move house to be closer to work at some point in the future. The reasons for this are explored in the following chapter.

Low skills mean that only low wages can be secured which in turn make running a car less viable which in turn limits the geographical size of the personal labour market open to lower-skilled individuals. Thus, low skill, low pay and low car ownership reinforce one another in causing labour market disadvantage to be concentrated in localised areas within the Glasgow conurbation which have suffered employment decline over recent decades.

How far can people actually commute within a metropolitan area? In a metropolitan area the size of the Glasgow conurbation, car drivers in jobs paying approximately the average wage or more will experience little restriction in where they can reasonably commute to within the conurbation, although cross city centre trips which encounter considerable traffic congestion can be difficult to sustain for long periods and may in the long run cause people to change jobs. Alternatively, they may move house, depending on whether they are more settled in their job or in their house, although this is investigated in more detail in the following chapter.

People who can only command a low wage, particularly if they cannot afford to run a car, are geographically restricted in where they can commute to. Those who left their jobs because of the journey to work in this study would have faced commutes of on average 106 generalised minutes, suggesting that this was out of range for the types of jobs they left, which were lower-skilled and low-paid. Those who stayed with their employers over the relocation periods, but have considered leaving their jobs because of

the journey to work, have commutes on average to the new sites of 89 generalised minutes, suggesting that this is close to the maximum that the majority of people will commute. Therefore, 90-100 generalised minutes is approximately the maximum 'distance' that people will commute for lower-skilled jobs. As a rule of thumb, this will correspond to a journey time by public transport, including walking and waiting time, of approximately 45-50 'real' minutes; or a journey by car of approximately 60-65 'real' minutes²³. This conversion will, however, depend greatly on the speed and length of journey and in relation to public transport, the frequency, reliability and comfort of the service.

These 'real' public transport travel times are likely to put most industrial estates in the ring of the Glasgow conurbation out of reach of public transport dependent residents in the core. Given that employment deconcentration has been greater than that of population in the conurbation, employment deconcentration in the face of such commuting constraints is likely to contribute towards creating greater average neighbourhood unemployment rates in the inner parts of the Glasgow conurbation than in the outer parts, and to the overall higher unemployment rate in the core compared to the ring.

How important is the journey to work in comparison to other reasons for people leaving or considering leaving their jobs? Poor pay is the most important reason overall for people considering leaving their job. For retained staff, the journey to work is the second most important, and for new recruits it is the fourth most important. This shows that the journey to work is an important consideration in people's employment choices.

Those dependent on public transport, women and those in lower-skilled and lower-paid occupations are the worst affected by the firm relocations. However, the change in commute induced by the firm relocations remained consistently the most powerful

²³ See the calculation of generalised travel time for a hypothetical bus journey presented in chapter five. For car travel, this approximate conversion assumes an average speed of 30 mph at 30mpg, fuel costing £3.00 per gallon and the value of time being £4.19 per hour in 1996, the year for which generalised travel time was used in the calculations presented in this chapter.

factor in explaining propensity to leave because of the journey to work. This suggests that space does affect all workers to a greater or lesser extent.

A methodological weakness of this analysis is that factors other than the journey to work may cause people to leave their jobs. Even if someone says the journey to work is one of the reasons for them considering leaving their job, this may be facilitated by the fact that the person may have more alternative employment options open to them, for example by virtue of living in proximity to more plentiful job opportunities or possessing skills which open-up a wide range of employment opportunities. However, given that overall employment availability has declined in the core of the Glasgow conurbation relative to the ring and that individuals face commuting constraints, it seems probable that employment deconcentration has contributed towards higher than average neighbourhood unemployment rates in inner Glasgow compared to the outer parts of the conurbation, and to the overall higher unemployment rate in the core than in the ring.

Small samples sizes are a problem in this analysis, although the uni-variate logistic regressions show the following variables to have a statistically significant relationship with an individual's propensity to leave their job because of the journey to work, at or above the 95% level: change in commute induced by the firm relocations; mode of travel to work; gender and income (in addition, occupational group is significant at over 91%). Using a forward stepwise procedure to calibrate a multi-variate model of propensity to leave because of the journey to work, change in commute, gender and occupational group are the most important variables in explaining propensity to leave because of the journey to work.

It is clear that a significant minority of people, mainly those dependent on public transport, women and those in lower-skilled occupations are limited in how far they can commute. In the Glasgow conurbation, employment has decentralised to a greater extent than population; and jobs in industrial estates in the ring of the conurbation are likely to be out of commuting range of these groups who live in the core, particularly if they do not have access to a car. These factors combine to mean that employment

deconcentration in the Glasgow conurbation is likely to have contributed to higher unemployment rates found in the inner parts of the conurbation compared to the outer parts, and to the overall higher unemployment rate in the core than in the ring.

Given the concentration of commuting as a barrier to employment on lower-skilled and lower-paid groups, it is difficult to argue that the findings presented here refute the 'skills mismatch' perspective. Clearly, skill level and occupational group are vital in determining the pay available to an individual which in turn determines how far it is viable for them to commute, particularly if it enables them to purchase and run a car. Thus skills mismatch reinforces spatial mismatch through restricting transport mobility. In large part due to low skills (but also due to restrictions on hours which can be worked in the case of women), certain groups cannot overcome the relatively minor geometrical spatial mismatch between residences in the core of the Glasgow conurbation and nodes of employment growth on industrial estates in the ring.

Since some people face constraints on how far they can commute, in the face of employment deconcentration some individuals may decide to make a residential move to the conurbation ring in order to be closer to suitable employment. The spatial mismatch hypothesis states that there are barriers to residential mobility within metropolitan areas which restrict this. Is this a viable option in the Glasgow conurbation for the groups least able to commute? Or does residential mobility pose a further spatial barrier to employment? This is investigated in the following chapter.

7. RESIDENTIAL MOBILITY AS A BARRIER TO EMPLOYMENT WITHIN THE GLASGOW CONURBATION

7.1 Introduction

The previous chapter reported evidence that some groups of people face constraints on how far they can commute within the Glasgow conurbation. These constraints were felt the most by lower-skilled and lower-paid groups, those dependent on public transport and women. Do some groups manage to overcome their commuting difficulties by moving house to be closer to work? The spatial mismatch hypothesis states that low income and manual workers located in metropolitan cores experience restrictions on their residential mobility which prevents this from taking place.

This chapter presents empirical evidence in relation to the extent to which people are able to move house within the Glasgow conurbation in order to access suitable employment opportunities. This addresses the second research objective of this study, namely 'to establish whether there are constraints on residential mobility within metropolitan areas which prevent some people from migrating to be closer to suitable jobs'. Within this objective, the following hypotheses are tested:

H5: residential mobility rates do not rise as a result of the relocations

H6: there is no relationship between the length of commute and the probability of moving house

H7: there is no relationship between the amount that workers' commutes were altered by their employer's relocation and their likelihood of moving house

H8: there is no relationship between the length of the initial commute of those who move house (for any reason), and their likelihood of shortening their commute as a result of moving house.

H9: there is no relationship between the amount that the commutes of those who move house (for any reason) were altered by their employer's relocation and their likelihood of shortening their commute as a result of moving house.

Hypotheses five, six and seven relate to the journey to work as a 'push' factor in people's decision as to whether or not to move house at all. Hypotheses eight and nine,

on the other hand, test whether or not the journey to work influences where people who are moving house in any case choose to move to (in other words, acts as a 'pull' factor in people's choice of residential location).

The material in this chapter is organised into a structure similar to that used in the previous chapter with regard to commuting as a barrier to employment. First, the impact that the firm relocations had upon residential mobility rates is investigated (hypothesis five). This hypothesis is based on the supposition that, in the face of commuting constraints, if no-one moved house to be closer to work, then this would be evidence that migration within the Glasgow conurbation is not a viable means of overcoming an unmanageable commute.

More specifically, the relationship between the length of commutes and the likelihood of moving house is then investigated (hypotheses six and seven). These first three hypotheses illustrate whether or not people within the Glasgow conurbation would be able to move house in response to declining accessibility to employment.

Hypotheses eight and nine are restricted to those who *have* moved house since the firm relocations. These two hypotheses test the extent to which people within the Glasgow conurbation are able to choose where they move house *to* in order to make their commuting more manageable.

The importance of shortening commutes in people's residential locational choices is compared against that of other factors such as housing availability and neighbourhood quality. The groups of people who appear to have less choice in whether and where they move house are described, and the reasons for this analysed. A multi-variate analysis using multiple logistic regression is presented which assesses the relative importance of various spatial and non-spatial factors in determining people's likelihood of moving house closer to work.

Material from the qualitative interviews is introduced throughout. However, the majority of it is presented in the section relating to the assessment of which groups of

people are more likely to move house closer to work in response to the firm relocations. This provides detail on people's aspirations and decision making with regard to housing, employment and travel choices, which aids the interpretation of the reasons why some groups are more likely than others to move house closer to work.

The 'summary and conclusions' section of this chapter summarises the findings, draws conclusions with regard to residential mobility as a barrier to employment within the Glasgow conurbation, and assesses the broader implications of these conclusions for understanding the spatial distribution of unemployment within the Glasgow conurbation. The robustness of the findings and conclusions in relation to residential mobility as a barrier to employment are also discussed in this section.

7.2 Spatial constraints on residential mobility within the Glasgow conurbation

This section presents evidence with regard to whether or not people are able to move house in order to overcome commuting constraints. Specifically, the first part of this section assesses whether or not people move house in response to the firm relocations studied by this work (hypothesis five). Hypotheses six and seven then test whether or not people with longer commutes are more likely to move house. Hypotheses eight and nine then test the question of whether or not people who are moving house in any case (for example in order to secure a larger house) take the opportunity to shorten their commute by virtue of the destination they choose.

7.2.1 Hypothesis five: residential mobility rates do not rise as a result of the relocations

If the residential mobility rate among the staff employed at the time of the firm relocations does not rise because of the relocations, then this is evidence that either, a) there are no constraints on commuting to the new sites, or b) that residential mobility is not a viable option in order to overcome the problem of commuting to the firms' new sites. Since the previous chapter showed that for some groups there are constraints on how far they can commute, in the *absence* of barriers to residential mobility we would expect residential mobility rates to rise as a result of the firm relocations. Therefore, the

acceptance of hypothesis five can be taken to mean b), that residential mobility is not a viable option in order to overcome the problem of commuting to the firms' new sites.

Since this study examines the impact of the firm relocations retrospectively, it is not possible to directly compare mobility rates before and after the firm relocations. Therefore, the original workforce's move rate since the relocations has been compared with that of new recruits as a control group. Note, however, that since the new recruits are on average younger than the workforce employed at the firms' original sites and younger age groups have higher residential mobility rates than older age groups, this introduces a bias in favour of finding support for hypothesis five.

The overall move rate since relocation of the original workforce is no different to that of people recruited since the firm relocation. Of retained staff, 5.3% per annum²⁴ moved house compared to 5.6% per annum²⁵ of new recruits (although these figures are calculated based on only 18 and nine movers respectively). Therefore, the firm relocations did not induce many, if any, people to move house – indeed, of the 18 retained staff who moved house, 15 said they would have moved house even if their job had not relocated. However, given the age related bias explained above, the three

²⁴ The annual move rate of retained staff was calculated as follows:
$$\frac{\sum_i (SRSM_i / TL_i)}{\sum_i SRS_i} * 12$$

Where: $SRSM_i$ =Sampled Retained staff who have Moved house since firm i relocated; TL_i =Time lag between relocation and survey of firm i in months; SRS_i =Sampled Retained staff (including movers) from firm i .

²⁵ Because the number of months between recruitment and the surveys is different for every individual, the annual move rate of new recruits was calculated in a slightly different way to that of retained staff. In this case, summation is done respect to individuals rather than with respect to firms. This means that the move rate is arrived at after the first stage of the division, because the total number of staff is captured by the 'time lag' which, when summing with respect to individuals, corresponds to the total employee months served by all new recruits (including movers).

It was calculated as follows:
$$\frac{\sum_j SNRM}{\sum_k TL} * 12$$

Where: $SNRM$ =Sampled New recruits who have Moved house (j) since being recruited (to any firm); TL =Time lag between the date that individual k was recruited and the date that individual k was surveyed. k refers to all new recruits, not just movers who have been labelled j .

people out of the 18 who said they would *not* have moved house had their employer stayed put may reflect the fact that some groups *are* indeed able to overcome commuting constraints by moving house to be closer to their workplace.

The similarity in mobility rates described above between members of the original workforces and new recruits suggests that very few people who face, or faced, commuting constraints on the new sites have the realistic option of moving house to be closer to their job. Therefore, hypothesis five, '*residential mobility rates do not rise as a result of the relocations*' can be accepted, but with a degree of uncertainty due to some conflicting evidence.

7.2.2 Hypothesis six: there is no relationship between the length of commute and the probability of moving house

This hypothesis also tests the notion of whether or not the length of someone's commute forms a 'push' factor in their decision of whether or not to move house. Assuming that there are constraints on commuting and that job availability in metropolitan cores is declining, then the need to migrate closer to work within a metropolitan area will arise. We would therefore expect people with longer commutes to be more likely to move house because of the journey to work. This would be evidence of the journey to work forming part of the 'push' factor in people's decision to move house within metropolitan areas. However, if as the spatial mismatch hypothesis suggests, there are constraints on low income residents' residential mobility, then some people will not be able to exercise such commute-shortening residential mobility.

Table 7.1 compares the commutes of those who have moved house since the firm relocations with those who have not moved house since the relocations. If hypothesis six is correct, we would expect the commutes of those who move house (prior to them moving) to be, on average, the same as the commutes of those who do not move house. Since new recruits as well as the staff employed at the firms' original sites can move house in order to be closer to work, they have been included in the analysis in relation to hypotheses six to nine. As with the tables in the previous chapter, commuting is measured in generalised minutes and is presented for car travel, public transport, and the

mode weighted commutes actually experienced by the people in the sample after taking account of their mode of travel to work. The mode weighted column therefore contains the most appropriate figures against which to test hypotheses six to nine. The 'car' column is composed of the travel time and cost between two points by car therefore can act as a proxy of the road distance separating home and workplace. The 'public transport' column gives an indication of the ease of travel between two points by public transport, taking account of the frequency and quality of service.

The mode weighted mean commute of those who moved house is 83 generalised minutes compared to 70 of those who did not move house. However, the medians are both 61 generalised minutes, suggesting that the journey to work indeed does *not* form part of people's decision to move house. This is evidence in support of hypothesis six, and is also consistent with hypothesis five. Note, however, that the commutes by car show that those who have moved house actually lived further in terms of road distance from work than those who did not move house. This is true for both mean and median commutes. The smaller difference when mode of travel is taken into account shows that those who move house are more likely to travel to work by car than those who do not move house, since generalised travel time by car between two points is usually less than by public transport.

However, many households have more than one person in employment therefore may minimise total household commuting in their residential locational decisions rather than considering only one individual's commute. Therefore, a more accurate test of hypothesis six measures total household commuting of those who move house and those who do not. These figures are presented in the lower part of table 7.1. The mean mode weighted total household commutes of those households which moved house was 126 generalised minutes compared to 91 of those households which did not move house. The difference between the median figures is less striking but substantial nevertheless, at 98 generalised minutes for the movers and 80 generalised minutes for the non-movers. This suggests that, when household residential choice in relation to more than one workplace is considered, the total amount of commuting undertaken by household members appears to influence their decision as to whether or not to move house. This

suggests that some households can, and do, overcome commuting constraints by moving house. Thus, on considering all the data in table 7.1, on balance hypothesis six cannot be accepted. The journey to work apparently does form part of the decision of some households to move house within the Glasgow conurbation.

The 'car' column in the lower part of table 7.1 shows that households who live further from household members' workplaces in terms of road distance are more likely to move house. However, as with the individuals' commutes reported in the upper part of table 7.1, this difference is diluted when actual mode of travel to work is taken into account in measuring the friction of distance.

7.2.3 Hypothesis seven: there is no relationship between the amount that workers' commutes were altered by their employer's relocation and their likelihood of moving house.

Building upon hypothesis six, hypothesis seven tests whether there is a relationship between the amount that workers' commutes were altered by their employer's relocation and their likelihood of moving house. This takes account of the fact that different individuals have different propensities to commute based on, for example, childcare commitments, shift patterns, leisure interests and personal preferences, which the previous analysis under hypothesis six could not take any account of. By examining the *change* in individuals' commutes induced by the firm relocations, we examine the impact of the change from equilibrium between home and workplace.

Table 7.2 shows the change in commute induced by the firm relocations for those who have moved house, and for those who have not moved house since the relocations. Because this analysis examines the *change* in commute induced by the firm relocations, those workers recruited at the firms' new sites cannot be included. Similarly, the change in household commuting has not been reported as this will be identical to the change in an individual worker's commute since any other household members who are in employment are not affected by the relocation of other household members' employers, unless more than one household member works for the same employer, but

this only applies in a small number of cases and in none of the cases where households have moved house.

The mean mode weighted change in commute induced by the firm relocations was 15 generalised minutes for those who subsequently moved house compared to 12 generalised minutes for those who did not move house. The medians are 21 and 16 generalised minutes respectively. Although these differences are relatively small and are based on small samples, this suggests that the journey to work *can* be reduced by residential mobility, at least for some groups of workers, which means that hypothesis seven cannot be accepted.

7.2.4 Hypothesis eight: there is no relationship between the length of the initial commute of those who move house (for any reason) and their likelihood of shortening their commute as a result of moving house

The analysis now turns to hypotheses eight and nine which test whether or not once people have made the decision to move house they are able to take the opportunity of shortening their commute by choosing a destination closer to their employer. In other words, these two hypotheses test whether or not shortening the journey to work is a 'pull' factor in people's residential location decisions. As with hypotheses six and seven which tested whether the journey to work was a 'push' factor, hypothesis eight examines the relationship with the length of people's initial commutes and then hypothesis nine examines the relationship with the *change* in commute induced by the firm relocations.

Table 7.3 shows the commutes of those movers who shortened their commute as a result of moving house, those who left their commute unchanged and those who lengthened their commute as a result of moving house²⁶. Those who shortened their journey to work as a result of moving house had mean commutes from their original addresses of 104 generalised minutes compared to only 53 generalised minutes for those who lengthened their commutes when they moved house, although the medians are only slightly different at 58 and 54 generalised minutes respectively.

The commutes by car and public transport show that those who shortened their commute as a result of moving house initially lived considerably further in terms of travel by car and public transport (and, by implication, most probably also further in terms of road distance) from their workplace than those who lengthened their commutes when they moved house. This difference is reduced when the mode of travel to work is taken into account in the measurement of generalised travel time, reflecting the fact that those who shorten their commute as a result of moving house are more likely to travel to work by car compared to those who lengthened their commute as a result of moving house.

Similar findings prevail when the impact of moving house on all household members' commutes is taken into account. However, in the case of total household commuting, the mode weighted median total household commuting of those households which shortened their total commuting is *less* than that of those who lengthened their total household commuting.

²⁶ Ideally, movers would have simply been divided into those who shortened their commute and those who lengthened their commute as a result of moving house. However, the change in generalised travel time cannot be calculated for people who made moves within the same postcode sector, since this is the finest spatial resolution at which travel times and costs are available in the matrix used in this study. Hence, the 'commute unchanged' category equates to those who moved house within the same postcode sector. Note that some of the movers in the 'shortened' and 'lengthened' categories may have altered their commute as a result of moving house only by a very small amount even although they may have moved a considerable distance in instances where their current and previous addresses may be almost equidistant from their employer. In these cases, because they moved to a different postcode sector, the result of subtracting their previous commute from their current commute is not zero, therefore they have been included within the 'commute shortened' or 'commute lengthened' categories.

The small sample numbers and conflicting results in table 7.3 make it difficult to come to a firm conclusion regarding hypothesis eight. However, worthy of comment are the long individual commutes and large total household commuting burdens among those who made localised moves within the same postcode sector. This group's median commutes are generally *greater* than *both* those of the other two groups, when we might expect a continuum to emerge. What explanation can be offered for this? The qualitative findings of this research showed that some residents of 'traditional' working class neighbourhoods have strong family and other ties to those neighbourhoods, where people had often lived for long periods of time.

For example, as one leaver stated:

"I've got family here; two daughters. We're in and out [of each others' houses] all the time".

And, in the words of an older retained member of staff:

"Well, my children are growing up in Balloch. It's pretty quiet, and the neighbours are fine".

These groups were usually very immobile owing to a reliance on public transport and an localised geographical perspective. People in this type of situation are unlikely to move out of their neighbourhood in order to be close to a job that is likely to be low-paid, lower-skilled, insecure and have poor prospects. Consequently, in some cases they bear very long and/or awkward commutes by public transport and cannot, or do not, take the opportunity of shortening their commute when they move house, preferring to move locally within the neighbourhood they consider 'home'.

7.2.5 *Hypothesis nine: there is no relationship between the amount that the commutes of those who moved house (for any reason) were altered by their employer's relocation and their likelihood of shortening their commute as a result of moving house.*

The *change* in commute induced by the firm relocations for individuals may have a closer relationship than the length of their commute before their move of house with

their likelihood of making a commute-shortening move of house. As with hypothesis eight, this is restricted to those who move house, in order to assess whether commute-shortening is a 'pull' consideration in where households decide to move to once they have made the decision to move house somewhere.

Table 7.4 shows the mean and median changes in commutes induced by the firm relocations for those who shortened their commutes as a result of moving house since their job relocated, for those who left their commute unchanged as a result of moving house, and for those who lengthened their commute as a result of moving house. Those who shortened their commute when they moved house had had their commutes on average *lengthened* by the firm relocations by 39 generalised minutes. Conversely, those who lengthened their commute as a result of moving house had had their commutes *shortened* by an average of 10 generalised minutes by their employers' relocations. The median figures are slightly less striking, but still illustrate a considerable difference, with the median relocation induced change in commute of those who shortened their commute as a result of moving house being a lengthening of 22 generalised minutes compared to a shortening of five generalised minutes among those who lengthened their commute as a result of moving house. In summary, of those who move house, those who had their commutes lengthened the most by the firm relocations are more likely to subsequently move house closer to work, while those who had their commutes shortened the most by the firm relocations are more likely to subsequently move further away from their workplace.

The change in commute induced by the firm relocations experienced by those who made localised moves of house within the same postcode sector is not significantly different to that of those who shortened their commute when they moved house. As discussed in relation to hypothesis eight, this group may be dominated by a core of people who have strong neighbourhood ties. However, on balance, table 7.4 shows that, at least certain groups of people are able to take the opportunity of moving house closer to work when they are moving house in any case. Therefore, we cannot fully accept hypothesis nine. However, it appears that there is a core of less mobile residents who cannot, or do not, take the opportunity of moving house to be closer to work.

Table 7.1 Commutes prior to moving of movers and non-movers

Moved house?	Individuals' commutes prior to moving (generalised minutes)									
	Car			Public transport			Mode weighted			
	Mean	Median	<i>n</i>	Mean	Median	<i>n</i>	Mean	Median	<i>n</i>	
Yes	64	57	28	145	145	28	83	61		27
No	54	48	221	130	127	221	70	61		214
	Households' commutes prior to moving (generalised minutes)									
	Car			Public transport			Mode weighted			
	Mean	Median	<i>n</i>	Mean	Median	<i>n</i>	Mean	Median	<i>n</i>	
Yes	104	92	28	221	213	28	126	98		27
No	74	60	221	177	162	221	91	80		214

Table 7.2 Firm relocation induced change in commute of movers and non-movers

Moved house?	Change in commute induced by firm relocations (generalised minutes)								
	Car			Public transport			Mode weighted		
	Mean	Median	<i>n</i>	Mean	Median	<i>n</i>	Mean	Median	<i>n</i>
Yes	10	19	18	42	27	18	15	21	18
No	9	14	150	23	21	150	12	16	150

Table 7.3 Commutes prior to moving by type of move

Type of move	Individuals' commutes prior to moving (generalised minutes)									
	Car			Public transport			Mode weighted			
	Mean	Median	<i>n</i>	Mean	Median	<i>n</i>	Mean	Median	<i>n</i>	
Commute shortened	86	56	9	156	146	9	104	58	9	
Commute unchanged	59	57	13	154	165	13	83	65	12	
Commute lengthened	43	43	6	109	92	6	53	54	6	
	Households' commutes prior to moving (generalised minutes)									
	Car			Public transport			Mode weighted			
	Mean	Median	<i>n</i>	Mean	Median	<i>n</i>	Mean	Median	<i>n</i>	
Commute shortened	199	93	5	294	272	5	199	93	5	
Commute unchanged	121	107	6	320	322	6	170	149	6	
Commute lengthened	97	79	3	264	225	3	109	116	3	

Table 7.4 Firm relocation induced change in commute by type of move

Type of move	Change in commute induced by the firm relocations (generalised minutes)									
	Car			Public transport			Mode weighted			
	Mean	Median	N	Mean	Median	n	Mean	Median	n	
Commute shortened	34	22	9	60	29	9	39	22	9	
Commute unchanged	16	18	12	58	36	12	19	20	12	
Commute lengthened	-14	-7	6	-19	7	6	-10	-5	6	

Table 7.5 below summarises the outcomes of the testing of each of the five hypotheses in relation to research objective two, ‘to establish whether there are constraints on residential mobility within metropolitan areas which prevent some people from migrating to be closer to suitable jobs’:

Table 7.5 Summary of outcomes of the testing of hypotheses five to nine

Hypothesis	Outcome
<i>H5: residential mobility rates do not rise as a result of the relocations</i>	Qualified acceptance; likely to be true for many groups, particularly lower-skilled and lower income groups, although a limited proportion of the workers at the firms’ original sites apparently do move house who would not do so otherwise; note also that this is based on a small sample.
<i>H6: there is no relationship between the length of commute and the probability of moving house</i>	Qualified rejection; people with longer commutes are, on average, more likely to move house but, again, this is not likely to apply to lower-skilled groups. In addition, the interpretation of hypotheses six to nine is complicated by the greater likelihood of inner city residents making decentralising moves to the suburbs for reasons of residential quality rather than because of the journey to work; note also that this is based on a small sample.
<i>H7: there is no relationship between the amount that workers’ commutes were altered by their employer’s relocation and their likelihood of moving house</i>	Qualified rejection; people whose commutes were lengthened the most are more likely to move house, but the qualification and the caveat outlined in relation to hypothesis six also apply; note also that this is based on a small sample.
<i>H8: there is no relationship between the length of the initial commute of those who move house (for any reason), and their likelihood of shortening their commute as a result of moving house.</i>	Qualified rejection; conflicting evidence was found in relation to this hypothesis; the qualification and the caveat outlined in relation to hypothesis six also apply; note also that this is based on a small sample.
<i>H9: there is no relationship between the amount that the commutes of those who move house (for any reason) were altered by their employer’s relocation and their likelihood of shortening their commute as a result of moving house.</i>	Qualified rejection; there is little difference between the amount commutes were altered by the firm relocations for those who shortened their commute by moving house and those who made localised moves, but those who lengthened their commutes by moving house had had their commutes on average shortened by their employers’ relocations; the qualification and the caveat outlined in relation to hypothesis six also apply; note also that this is based on a small sample.

7.3 The influence of non-spatial factors on residential mobility within the Glasgow conurbation

The previous analysis has shown that the journey to work has only a very small influence on people's decision to move house within the Glasgow conurbation. Not many households would consider moving house solely because of the journey to work. In other words, reducing the journey to work is not a major 'push' factor in causing people to move house. However, some people who had their commutes substantially increased by their employers' relocations took the opportunity of reducing their journey to work when moving house in any case. In other words, reducing the journey to work is a 'pull' factor in some people's decision as to where to move house to.

Despite this, some people with strong ties to their neighbourhood tolerate long and awkward commutes and do not move away from their neighbourhood in order to shorten their commute. Therefore, for some groups of people, residential mobility is not a viable option in order to overcome commuting constraints. The precise characteristics of these immobile groups are investigated in more detail in the following section.

The analysis so far has focused entirely on the influence of commuting on residential mobility. But how important is reducing the journey to work in comparison to other factors which influence residential choice within metropolitan areas, such as housing cost and availability, and neighbourhood desirability? This is the subject of this section. This investigation will help assess whether it is valid to interpret, as has been done throughout this chapter so far, commute-shortening migration behaviour being to reduce the journey to work rather than as an incidental outcome of suburbanising residential moves for reasons of residential desirability.

Table 7.6 shows overall move factors for retained staff and new recruits combined. Eight of the ten new recruits who have moved house and all of the 18 members of retained staff who have moved house answered the question regarding reasons for moving, giving a total of 26 movers on which table 7.6 is based. Note that table 7.6 is based on responses to a question to which up to three responses were invited.

Table 7.6 Reasons for moving house

Reason for moving house	Number of people citing reason	% of reasons cited
To change house	12	21
To own home	11	19
Change household circumstances	9	16
Shorten journey to work	8	14
Close to friends/relatives	5	9
Have a garden	5	9
Better area	3	5
Better quality house	2	3
Close to good schools	2	3
Personal	1	2
TOTALS:	58	100

To shorten the journey to work is ranked fourth in terms of the number of times it was cited by movers as a reason for their move, after 'to change house', 'to own home' and 'change in household circumstances'. To shorten the journey to work was cited as a factor in their decision to move house by eight of the 26 movers (31%) who answered the question. The eight responses represent 14% of the 58 responses given to the question about reasons for moving house. Among those in the sample, shortening the journey to work is therefore less important than housing and demographic considerations but is more important than a variety of 'soft' quality of life considerations such as being close to friends and family, having a garden, living in a better area, etc. However, the total number of responses to all of these categories combined exceeds that of 'to shorten the journey to work'.

It is difficult to provide a meaningful comparison of move factors by mode of travel because only six responses from four respondents were obtained from public transport users. However, two of the six responses (33%) were to shorten the journey to work compared to only six out of 52 responses (12%) from car drivers. This small number of

responses to this question from public transport users reflects the fact that public transport users are less likely to move house than car drivers.

Younger people are unsurprisingly more likely to move house because of changed household circumstances, to own their home and to live in a better area. Older people are more likely to move to improve the quality of the house in which they live. This can also act as a barrier to migration, for example:

"I've spent money on the house since I bought it from the council, so we'll no be moving, no... I would make one comment though: the travelling at the moment is very long." [older skilled manual male, retained member of staff]

It is again difficult because of small sample sizes to infer much about differences in move factors by household income. Households on intermediate incomes who move house appear to be slightly more likely to do so in order to move to a better area, with all three respondents who moved for this reason being in households with a gross annual income of £20-30,000. This may represent the less desirable characteristics of the areas they lived in previously and their financial ability to move elsewhere.

Residential and employment locational decisions appear to be integrated with 'life-course' decisions associated with arranging childcare, buying cars and second cars and making commitments to the length of time household members feel they are likely to want to live in the same house and stay with the same employer. For example, this man in his late twenties explained his family's thinking behind the possibility of moving house to be closer to his work place as follows:

"Well, that [the possibility of moving house closer to his work] depends on a lot of things; my wife really likes her job, so she'd like to go to it after she's had our baby, but that depends on how she is after it's born, y'know. It's down the road from her folks too so we might move in that direction if they're going to look after the wean [child]. Or maybe we'll get another car and just buy a house out Rutherglen [closer to his workplace] or something; if we can afford it like."

7.4 Who is affected the most by residential mobility as a barrier to employment?

This section considers what groups of people are more likely to make residential moves and, more specifically, move house closer to work. This analysis serves three purposes. First, it will aid understanding of the nature of residential mobility as a barrier to employment. For example, are tenants in the social rented sector less likely to move house closer to work? How important are neighbourhood ties in preventing people from moving house closer to work?

The second purpose of this part of the analysis is to highlight which groups face the greatest residential immobility as a barriers to employment. Third, in the light of this, policies to help people overcome residential immobility as a barrier to employment can be better targeted on those groups most adversely affected.

This chapter has so far shown that the journey to work does not, or cannot, form a significant 'push' factor in causing many households to move house. The previous chapter showed that lower-skilled groups, particularly lower-skilled women and lower-skilled young people face constraints on how far they can commute. Because these groups were more likely to leave their job because of the journey to work even if they did not have alternative employment available, this means that these groups are likely to experience an inferior position in the labour market because they cannot, or it is not worthwhile for them to, move house to be within commuting range of suitable employment opportunities.

In contrast, some groups of people are able to reduce their commute when they move house, although the journey to work did not form part of the reason for them moving at the outset. What characteristics do they have? Are they higher skilled and higher incomes groups compared to those who are unable to reduce their commutes by residential mobility? The previous chapter showed that those more likely to leave their job because of the journey to work were *lower-skilled* and earned *less* than other workers. If these groups had the need to leave their jobs because of the journey to work, then they, *a priori*, must have been unable or unwilling to reduce their journey to work by moving house closer to their employer. Therefore, it is to be expected that the

groups with low commuting mobility identified in the previous chapter will also display low residential mobility, particularly moves which shorten their commutes, in the analysis to follow in this section.

New recruits who have made commute-shortening moves have been included in this analysis because they too represent people who may have moved house in part because of the location of employment. The time periods between the firms' relocations and the survey were not sufficient to generate a large number of people who had moved house; commute-shortening movers number only nine, seven of whom are members of retained staff and two of whom are new recruits. To boost numbers, the 19 respondents who have considered making a commute-shortening move have also been analysed. Note that the time frame of reference for migration is since the firms' relocations in the case of retained staff, and since joining the firm in the case of new recruits.

The following tables provide descriptive statistics regarding the characteristics of people, broken down into different groups, indicating their propensity to make commute-shortening residential moves. First, table 7.7 shows these groups by current housing tenure. Note that this table is current housing tenure; in the case of some movers, previous tenure is different. Current tenure was considered the most appropriate because it reflects the tenure choice that movers were actually able to make.

People moving into an owner occupier property have the highest mobility rate and are more likely to make a commute-shortening commute than all other housing tenures, and owner occupiers are the most likely to consider shortening their commute. Those in Housing Association properties are significantly less likely to move than those in council housing. This may be because Housing Associations tend to be small scale and community based, making it less likely that Housing Association tenants will be able to move a significant distance while remaining with the same landlord. In addition, Housing Association tenants may be more satisfied with their housing than council tenants, as Housing Associations can often raise more capital for investment in properties than local authorities. The higher residential mobility of owner occupiers and the lowest residential mobility of Housing Association tenants, including likelihood of

Table 7.7 Move propensity by current housing tenure

Move propensity	LA		HA		SH		PRS		OO	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Not considered moving*	26	84	17	94	3	75	2	100	143	78
Considered shortening commute*	2	7	.	.	.	.	.	.	17	9
Lengthened commute^	1	3	.	.	1	25	.	.	4	2
Unchanged commute^	2	7	1	6	.	.	.	.	10	6
Shortened commute^	.	.	.	.	.	.	.	.	9	5
TOTALS:	31	100	18	100	4	100	2	100	183	100

LA – Local authority;

HA – Housing Association;

SH – Scottish Homes

PRS – Private rented sector;

OO – Owner occupier

* These groups were identified based on a yes/no answer to the question “Have you considered moving house to be closer to xxx?” (xxx = name of the area the firm in question relocated to).

^ These groups were identified based on the nature of the actual migration they made. ‘Unchanged commute’ refers to a move within the same postcode sector.

making commute-shortening moves, is consistent with there being administrative and other obstacles to residential mobility faced by tenants in the social rented sectors.

Given the commuting constraints faced by lower income and lower-skilled groups in the previous chapter, this residential immobility is likely to contribute to disadvantage in the labour market. Given the higher proportion of social rented tenants in Glasgow City compared to the ring of the conurbation as identified in chapter four, residential immobility in the face of employment deconcentration is likely to contribute to the observed spatial pattern of higher unemployment rates in the inner parts of the conurbation.

Table 7.8 shows the previous and current housing tenure of the 26 people in the sample who had moved house and provided information on their previous housing tenure. It strongly reflects the overall shift in housing tenure in the Glasgow conurbation towards owner occupation, particularly from local authority housing.

Table 7.8 Change in housing tenure associated with migration

Previous tenure	Current tenure				
	Local authority	Housing Ass.	Scottish Homes	Private rented	Owner occupier
Local authority	1	.	.	.	4
Housing Association	.	1	.	.	1
Scottish Homes	.	.	.	.	2
Private rented sector	.	.	.	.	2
Owner occupier	1	.	1	.	13

When the previous tenure of movers was analysed rather than current tenure, the private rented sector, Scottish Homes (although both on very small samples) and council tenants had higher mobility rates than owner occupiers. Housing association tenants again had the lowest mobility rate. Of those who moved, owner occupiers were slightly more likely to make a commute-shortening move than people in other tenures but when considering all households, not only those who moved, council tenants' overall higher mobility rate made them more likely to make a commute-shortening move. Council tenants are more likely to make a move which does not alter their commute. This probably reflects stronger neighbourhood ties among social renters. Interviewees who were dependent on public transport said they had close family members in the neighbourhood so would not consider moving.

Manual and lower-skilled groups have also been shown by previous work to have lower residential mobility (for example, see Doogan, 1996). In addition, since lower-skilled groups were shown in the previous chapter to be more likely to leave their job because of the journey to work, this may have been because they are less able to move house closer to work. Table 7.9 below shows move propensity by occupational group.

Professionals and managerial/technical workers have slightly higher overall mobility rates than other occupational groups. Note, however, that the professional group is based on only seven observations and the unskilled group only on five; while the table as a whole is based on 237 observations (four of the 241 members of retained staff and new recruits did not adequately describe their job title).

Table 7.9 Move propensity by occupational group

Move propensity	Occupational group											
	<i>Prof=Professional; Man/T=Managerial/technical; SkNM=Skilled non-manual; SkMan=Skilled manual; Semi=Semi-skilled; Unsk=Unskilled</i>											
	Prof		Man/T		SkNM		SkMan		Semi		Unsk	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Not considered moving	5	71	45	76	73	80	38	83	25	86	4	80
Considered shortening commute	1	14	7	12	7	8	2	4	2	7	.	.
Lengthened commute	1	14	.	.	2	2	3	7	.	.	.	.
Unchanged commute	.	.	2	3	6	7	2	4	2	7	1	20
Shortened commute	.	.	5	9	3	3	1	2	.	.	.	.
TOTALS:	7	100	59	100	91	100	46	100	29	100	5	100

Of those who have moved house, managerial/technical workers are slightly more likely to shorten their commute, while skilled non-manual workers are more likely to unchange their commute, and skilled manual workers are more likely to lengthen their commute, although these observations are based on small sample numbers. The low propensity of lower-skilled groups to make commute-shortening residential moves is consistent with these same groups also having a higher propensity to leave their jobs because of the journey to work, as was shown to be the case in chapter six.

Previous work has shown higher income groups to have higher residential mobility rates overall (for example, see Cadwallader, 1992). Confirming this, there is a general tendency for mobility to increase with income in the data collected in this study, although there are no significant variations in the type of move made. Ten per cent (4/39) of those on gross annual incomes of less than £10,000 have made any type of move or considered moving to be closer to work compared to 23% (10/43) of those on over £20,000 gross per annum. A similar pattern is also true, unsurprisingly, of household income. This relationship between residential mobility and income is, once again, logically consistent with lower income groups being more likely to leave their job because of the journey to work, as identified in chapter six.

Public transport dependency can be expected to influence people's likelihood of moving house closer to work. On one hand, being a less convenient means of travel, particularly to suburban industrial estates, people who commute by public transport may be more likely to move house closer to work. Counter to this, however, is that public transport dependency may increase neighbourhood ties particularly if family and friends live in the same neighbourhood, making people less willing to move elsewhere. Table 7.10 shows move propensity by mode of travel to work.

Table 7.10 Move propensity by mode of travel to work

Move propensity	Car		Public transport	
	<i>n</i>	%	<i>N</i>	%
Not considered moving	157	79	37	86
Considered shortening commute	18	9	1	2
Lengthened commute	5	3	1	2
Unchanged commute	11	6	2	5
Shortened commute	7	4	2	5
TOTALS:	198	100	43	100

Public transport users' overall residential mobility is slightly less than that of car drivers, with 86% of the former not having moved or considered moving compared to 79% of the latter. Public transport users are also less likely to consider making a commute-shortening move compared to car drivers, with two per cent of public transport users having considered moving closer to work compared to nine per cent of car drivers. This is consistent with the finding of the previous chapter which showed public transport users to be more likely than car drivers to leave their job because of the journey to work because they tend to have stronger neighbourhood ties. However, there is no significant difference in the proportion of those who travel by public transport and those who travel by car who *actually* shorten their commute when they move house.

Analysis by age shows broadly decreasing mobility of all migration types with age, consistent with previous findings (for example, Millington, 1995). The exception to this is that none of the respondents under the age of 20 has moved or considered moving. People in the 20-24 years category have the greatest overall move propensity, with only two-thirds (16/24) having *not* made any type of move or considered moving to shorten their commute compared to a global proportion of 80% (194/241). This probably represents household formation. There is a slight tendency for older people who move *not* to do so in order to shorten their commute, although this is based on an impression from the distribution of a small number of observations across move types. This may be because older people have laid down more roots in their local neighbourhood so are less likely to be prepared to move house in order to reduce their commute.

Indeed, interviews showed that in particular the proximity of sons and daughters is an important reason to remain in the local neighbourhood, particularly for those without access to a car. For example, a leaver who has not secured alternative employment when asked if she considered moving house to be closer to her previous job which relocated, stated:

"No, definitely not. I've lived here for 26 years".

Another leaver, in response to the same question, stated:

"I've never considered moving. I've been in this house for 40 years."

Length of service with the firms shows no consistent effect migration decisions related to the journey to work. However, a salesman in his late twenties explained that how long he anticipated remaining with his employer featured in his consideration of whether to move into a house closer to where he works:

"Aye I would [consider moving house to be nearer work]; no at the moment though, but probably sometime. You know, I'll wait and see how things pan out here."

("Do you mean if you think you'll be with this firm for a few years?")

"Aye, exactly."

The evidence presented so far suggests that commute-shortening migration within the Glasgow conurbation is mostly confined to owner occupiers and car drivers, suggesting that there are barriers to other groups moving house to be closer to their workplace. Car ownership may be the key factor in employment influenced migration decisions. Car drivers are more likely to make commute-shortening moves; this, coupled with emphasis given in interviews to immediate access to family and friends, suggests that, without a car, families will not move house to shorten their commute as they would find it difficult to visit family and friends by public transport.

7.4.1 Multi-variate analysis of propensity to make commute-shortening residential moves

As with the analysis in the previous chapter, there are collinearities between the variables which have been tabulated against moving behaviour. It is important to control for these relationships in order to assess the impact of each variable on people's propensity to move house closer to work.

In addition, it is also important to assess the importance of firm relocations in comparison to the importance of people's characteristics in determining people's propensity to move house closer to work. This puts the hypothesis tests reported earlier into fuller context.

Multiple logistic regression has been performed to assess the relative importance of the different variables on the probability of an individual with certain characteristics moving house. Because this study is concerned with employment related migration, the dependent variable has been defined as the probability of shortening, or considering shortening, the journey to work by moving house. Little, if anything, new would have been discovered by modelling propensities to move house for any reason with such small-scale data.

Table 7.11 shows the simple uni-variate logistic regression relationships between individuals' propensity to shorten their commute by moving house (actual or

considered) and key spatial, demographic and socio-economic characteristics. Note that the journey to work (JTW) and total household commuting (HHJTW) have been used as independent variables rather than the relocation induced change in journey to work as was used for the leave propensity analysis in chapter six, because this enables new recruits to be included in the move propensity analysis. This has the advantage of increasing the sample size. In the interests of space, only those variables with significance $< .5$ have been shown in table 7.11.

The variables which appear in table 7.11 are listed on the following page. Each categorical variable has a series of dummy variables coded as zeros or ones. The category used as the reference category in the logistic regressions for each categorical variable is indicated by square brackets [].

Dependent variable:

CSMP – Commute-shortening move propensity (shortened commute or considered shortening commute by moving house; 0=no, 1=yes)

Independent variables:

HHJTW – Total household journey to work prior to moving house (mode specific generalised time)

JTW – Individual journey to work (mode specific generalised time)

PT – Public transport dummy (0=car, 1=PT)

PRO – Professional dummy (0=no, 1=yes)

MN – Managerial/technical dummy (0=no, 1=yes)

SN – Skilled non-manual dummy (0=no, 1=yes)

SM – Skilled manual dummy (0=no, 1=yes)

SEM – Semi-skilled dummy (0=no, 1=yes)

[UNS – Unskilled dummy (0=no, 1=yes)]

KID – Children <16yrs present in household dummy (0=no, 1=yes)

INC – Income scale

HIN – Household income scale

SER – Length of service with employer (months)

Table 7.11 Uni-variate logistic regression models of commute-shortening move propensity

Variable	Beta	SE Beta	Signif	R	Exp (Beta)	-2 Log Likelihood	Pseudo R-square
HHJTW	.0064	.0026	.0121	.1583	1.0064	165.084	<i>n</i> =233
Constant	-2.6679	.3606	<.0000				.026
JTW	.0090	.0038	.0183	.1443	1.0090		<i>n</i> =233
Constant	-2.6919	.3864	<.0000			165.827	.023
PT	-.6557	.6357	.3023	<.0000	.5191		<i>n</i> =241
Constant	-1.9344	.2140	<.0000			171.932	.005
Occ. Group			.3338	<.0000			<i>n</i> =237
PRO	5.4100	16.4290	.7419	<.0000			
MN	5.8365	16.3967	.7219	<.0000			
SN	5.1099	16.3969	.7553	<.0000			
SM	4.5391	16.4044	.7820	<.0000			
SEM	4.5990	16.4099	.7793	<.0000			
Constant	-7.2017	16.3935	.6604			165.106	.029
KID	-.5899	.5164	.2533	<.0000	.5544		<i>n</i> =241
Constant	-1.8949	.2236	<.0000			171.718	.006
INC	.3434	.1323	.0094	.1784	1.4098		<i>n</i> =194
Constant	-3.7593	.7911	<.0000			141.685	.037
HIN	.2303	.0808	.0044	.2058	1.2590		<i>n</i> =178
Constant	-3.6368	.7190	<.0000			136.090	.046
SER	-.0040	.027	.1369	-.0351	.9960		<i>n</i> =237
Constant	-1.7161	.2611	<.0000			169.313	.012

Ranked by significance and pseudo R-square, household income is the characteristic most strongly correlated with probability of making or considering making a commute-shortening residential move, followed by income, followed by total household commuting prior to moving house (HHJTW), followed by the journey to work for the individual prior to moving house (JTW), followed by length of service with the firm, followed by the presence of children in the household, followed by the mode of travel to work. Note, however, that the measurement of HHJTW and JTW in generalised travel time takes account of mode of travel to work, therefore the non-significance of the public transport dummy should not be taken to mean that dependency on public transport does not restrict residential mobility, as has been argued previously.

All signs are as expected, with the exception of length of service which shows that those with shorter service with a firm are more likely to consider or actually move house closer to their employer. However, this is likely to be due to collinearity between age and length of service, with older people generally having served longer with the same employer and also being less likely to make any sort of residential move, whether moving nearer their employer or not. Note that housing tenure was not statistically significant, despite the emphasis which has been attached to the apparent effect that social housing has on restricting residential mobility by some previous work (for example, Hughes and McCormick, 1981; Minford et al, 1987; Gordon, 2002).

As with the leave propensity analysis which was reported in the previous chapter, the forward stepwise entering of variables was performed. Significance of $<.50$ was chosen as a cut off for inclusion in this procedure instead of $<.25$ in the case of leave propensities because so few variables reached this level of significance. Mode of travel and occupational group fall into the significance range .25 to .50. All the variables in table 7.11 meet this significance criterion. However, JTW was excluded from the forward stepwise procedure because it is closely related to HHJTW but HHJTW has slightly better goodness of fit and statistical significance levels in the uni-variate models. In addition, it makes more sense, *a priori*, that households consider total

household commuting rather than only one individual's commute when making residential locational choices.

The best overall fit using the forward stepwise procedure is achieved with only household income included. To gain some purchase on the relative importance of the above variables, they were all entered on block one of the calibration process.

Occupational group and income were highly insignificant, so these were removed and the remaining variables were entered on block one. This yielded the model shown in table 7.12. The coefficients on the variables reflecting mode of travel and the presence of children in a household are slightly unstable, but do not change by much more than an order of magnitude from the uni-variate analyses.

Table 7.12 Multiple logistic regression model of commute-shortening move propensity *n=171*

Variable	Beta	SE Beta	Signif	R	Exp (Beta)	-2 Log Likelihood	Pseudo R-square
HHJTW	.0066	.0034	.0548	.1089	1.0066		
PT	-1.1305	.8419	.1793	<.0000	.3229		
KID	-.6624	.5698	.2450	<.0000	.5156		
HIN	.2023	.0900	.0245	.1466	1.2242		
SER	-.0052	.0037	.1647	<.0000	.9948		
Constant	-3.3824	.8179	<.0000			126.202	.159

As can be seen, total household commuting is nearly significant at the 95% level and household income is significant comfortably at the 95% level. They have partial correlations of .1089 and .1466 respectively, significantly higher than any others, although household income may reflect general residential mobility rather than specifically commute-shortening mobility. None of the other variables is significant at the 90% level. Note that length of service has the wrong sign, suggesting that it may be acting as a proxy for age, as argued previously.

It has not been possible to calibrate a reliable multi-variate model to explain propensity to make a commute-shortening residential move within the Glasgow conurbation. Had sample sizes been larger then this may have been possible. However, suffice to say that the length of total household commuting and total household income, *ceteris paribus*, both have positive relationships with the probability of a household making, or considering making, a residential move closer to one household members' workplace. Dependency on public transport acts as a constraint on households' probability of moving house or considering moving house to be closer to work, owing to restricted transport mobility meaning that people become tied to their 'home' neighbourhood where family and friends also live. Evidence of this was obtained from the qualitative interviews carried out in the course of this work.

7.5 Summary and conclusions

The data collected to test hypotheses five to nine, and to assess the relative importance of the journey to work in comparison to other factors in the decision to move house within the Glasgow conurbation, has unfortunately not been particularly satisfactory in providing clear results. The main problem has been the small sample sizes, particularly of people who have moved house, generated by the firm relocation approach.

A further methodological problem has been in relation to the interpretation of commute-shortening behaviour. Since the majority of the firms have made decentralising relocations, workers who move to the suburbs for reasons of residential desirability may incidentally shorten their commute, although the journey to work may not have formed any part of their decision to move. However, the journey to work does feature as a significant factor in people's overall decision to move, suggesting that this is not a significant problem. In addition, the strong relationship between the amount that people's commutes were altered by the firm relocations and their likelihood of moving house also suggest that this is not a major methodological weakness. Finally, the fact illustrated in relation to hypothesis six that the relationship between total *household* commuting and the likelihood of moving house is stronger than the relationship for *individuals'* commutes also supports the view that this is not a problem in interpreting commute-shortening residential migration. Since other household members' jobs may

not be in the conurbation ring (or, if they are, they may not be on the same side of Glasgow city centre), this suggests that commute reduction is indeed a consideration in where moving households decide to move to.

Despite these limitations, no evidence was found that residential mobility rates rise as a result of the relocations, therefore hypothesis five can be accepted, but qualified by small sample sizes. However, there was some limited evidence that people with long commutes and those whose commutes were lengthened the most by the firm relocations were more likely to move house (hypotheses six and seven), suggesting that perhaps some people were persuaded to move house in response to the firm relocations. Again, some limited evidence was found in support of hypotheses eight and nine which test whether people are able to move house to be closer to work when they are moving house in any case. However, a number of people interviewed in the course of this research said that they would consider where they work when deciding where to move house.

The previous chapter showed that the firm relocations in this sample resulted in 6-12% of staff leaving their jobs, about half of whom went on to secure a new job. This chapter has shown that, although the journey to work is not a major push factor in people's housing choices, it is a consideration when other factors trigger a move of house in any case.

However, the very groups who need to move closer to work to overcome commuting constraints are the same groups for whom it is the least realistic to do so, mainly due to strong family and neighbourhood ties caused by low transport mobility and a localised geographical perspective. Commuting constraints and residential immobility go hand-in-hand with low income, low skills and strong ties to traditional working class neighbourhoods, often dominated by social rented housing, although little empirical evidence was found that the nature of this housing tenure *per se* restricts residential mobility.

In terms of understanding the spatial distribution of unemployment within the Glasgow conurbation, the results and analysis presented in this chapter suggest that the residents of such traditional working class neighbourhoods are likely to experience labour market disadvantage due to the particularly strong deconcentration of blue-collar employment in the face of constraints on their commuting and residential mobility. Low skill levels restrict both commuting and residential mobility by limiting the wage available to lower-skilled members of the workforce. This interaction between low skills, low commuting mobility, low residential mobility and employment deconcentration helps explain the spatial concentration of unemployment in neighbourhoods found in the core of the Glasgow conurbation and in other pockets of low income and social rented sector housing within the wider conurbation. Low commuting and residential mobility and a localised geographical perspective are likely to have implications for the spatial extent of job search activities of the unemployed in certain neighbourhoods. How do such individuals access information about job vacancies which may be located a considerable distance from their 'home' neighbourhood? And how do firms advertise job vacancies, and how do they decide which applicants to hire? These issues are investigated in the following chapter.

8. JOB SEARCH AND RECRUITMENT AS SPATIAL BARRIERS TO EMPLOYMENT WITHIN THE GLASGOW CONURBATION

8.1 Introduction

The spatial mismatch hypothesis emphasises commuting and residential mobility as the main spatial barriers to employment within metropolitan areas. Indeed, the previous two chapters of this thesis provide some evidence that both commuting and residential mobility present spatial barriers to employment within the Glasgow conurbation to certain groups of people. The spatial mismatch hypothesis, however, acknowledges that how information about job vacancies is accessed and disseminated across space via job search and recruitment may also constitute a spatial barrier to employment. However, the nature and importance of this remains largely unresearched.

Consider the hypothetical scenario of people being unlimited in how far they can commute and/or being unlimited in their willingness and ability to move house to be closer to work. We might think that there would be no spatial barriers to employment in this scenario. However, if people in this 'frictionless' world are less likely to find out about a job vacancy the more distant it is, then living in greater proximity to suitable job opportunities will be an advantage in being able to secure employment. Therefore, the spatial mismatch hypothesis could, in theory, be correct, even if there were no constraints on commuting and residential mobility.

Two factors influence the likelihood of an individual in location i finding out about the existence of a job vacancy in location j . First, the spatial extent of that individual's job search activities; and second, the spatial extent of information about the job vacancy. If these two overlap, then the job seeker will find out about the job vacancy. This chapter therefore considers explicitly these two factors after a more general consideration of the spatial outcome of job seekers securing jobs. Note that this final outcome is also influenced by whether an individual applies for a job once they have found out about it, whether they are offered the job and whether they accept the job offer. However, assessing the importance of these precise mechanisms is beyond the scope of this

research which is primarily concerned with assessing the nature and magnitude of commuting, residential mobility and job search/recruitment overall in relation to each other, rather than providing a detailed analysis of the spatial operation of job searcher/vacancy matching processes.

This chapter presents evidence gathered in relation to the third research objective of this thesis, 'to establish if job search and/or recruitment processes present spatial barriers to employment within metropolitan areas'. The main thrust of this analysis is in testing hypothesis ten, '*new recruits tend to live closer to the firms' new sites than retained staff*', which assesses the spatial outcomes of job search and recruitment behaviour in comparison to the maximum distance that people could *potentially* commute.

The general logic behind this part of the firm relocation methodology is different to that used in relation to the first two research objectives which examined whether or not workers could commute and, if not, move house to be closer to their employers in response to the firm relocations. The first two research objectives were examined by assessing the impact of the firm relocations on the workers employed immediately prior to the relocations, based on the fact that the firm relocations constituted 'natural spatial experiments'. In contrast, the third research objective is assessed by examining the spatial location of people recruited at the firms' new sites. Since the logic is different, the methodological basis of hypothesis ten is recapped at the beginning of this chapter, before presenting empirical evidence in relation to it.

The nature of job search as a spatial barrier to employment within the Glasgow conurbation is then considered. This is done through an assessment of the different job search channels used by different groups of people. A discussion of the spatial extent of information provided by different job search channels is given. Qualitative findings from interviews with employees and former employees are then presented in relation to how people search for work and the spatial extent of their job search activities.

The final section of this chapter then presents qualitative findings from interviews with the firms in relation to how firms advertise vacancies and recruit staff. Specific consideration is given to the spatial extent of these activities.

8.2 Methodology

The logic behind the investigation of the roles of job search and recruitment is different in that those recruited at the firms' new sites are of primary importance. New recruits' commutes are compared against the maximum tolerable commute for a given job, as evidenced by the commutes of the retained staff, some of whom have had their commutes 'stretched' close to 'snapping' point. The methodology behind testing hypothesis ten exploits the effect of the firm relocations of bringing some of the retained staff to their maximum tolerable commute for the job they are in, given its level of pay, hours and conditions as well as their own personal and family characteristics and situation. This is explained in more detail in the following section.

It should be borne in mind that the firm relocation approach as first developed by Fernandez (1994) and Zax and Kain (1996) was not designed specifically with testing the importance of job search and recruitment as spatial barriers to employment in mind. However, this study exploits the incidental opportunity to gather data to shed some light on the spatial outcomes of job search and recruitment behaviour, albeit not to test the specific mechanisms in great detail by which job search and recruitment may act as spatial barriers to employment.

8.2.1 Recap of the methodology to test hypothesis ten

The commutes to the new site of employees who worked at the previous site represent how much travel burden workers are prepared to accept, as many of these workers had their journey to work lengthened, yet stayed with their employer. These commutes have been 'stretched' to the point where some of them have 'snapped' (i.e. the commutes of those who left their jobs because of the journey to work). Therefore, the commutes close to 'snapping' represent the maximum commute that is marginally viable for certain workers in certain jobs.

In contrast, the commutes of people recruited at the new site represent the spatial extensiveness of job search and recruitment processes. If these 'new recruits' live closer to the employers' new sites than the existing workers, then it can be argued that job search and recruitment pose greater spatial constraints than travel, as these people could *potentially* travel further for the job they have just been recruited to, as evidenced in the fact that some of the retained staff tolerate longer commutes for the same job. In contrast, if there was only the spatial friction of *travel* but no spatial barriers to job *search or recruitment*, then we would expect an identical spatial pattern of retained staff and new recruits. The difference between the commutes of retained staff and new recruits is thus an indication of the extent to which people find out about job vacancies within their potential personal commuting range. For example, if new recruits' commutes are 90% the distance of the commutes of retained members of staff, then this suggests that job search and recruitment activities penetrates 90% of people's potential commuting catchments.

This logic again exploits the fact that the only thing to change at the time of the firm relocations is the employees' journeys to work. Not only do the retained staff already know about the jobs, but they actually hold a job before it relocates. Thus, job search and recruitment processes do not influence whether or not they stay in their job. Rather, this is entirely dependent on their ability to commute to the new sites. New recruits, in contrast, have to go through the typical processes of searching for information about job vacancies, applying and being accepted by an employer.

To test the extent to which job search and recruitment practices penetrate potential commuting fields, the following hypothesis is tested:

H10: new recruits tend to live closer to the firms' new sites than retained staff

An advantage of being able to identify the travel to work pattern of new recruits is that they have not had time to adjust their place of residence to shorten their commute. Therefore, the new recruits' commuting pattern reflects the spatial outcome of job search and recruitment, in contrast to the commuting pattern of all employees, many of

whom will have moved house since starting their current job (this is a weakness of studies which describe the distances different groups of people travel to work from secondary data sources). The distance new recruits travel to work before they move house therefore reflects what is happening in the local labour market as it focuses exclusively on the process of matching job vacancies with job seekers.

8.2.2 *Critique of hypothesis ten*

As noted previously, two factors influence the likelihood of an individual in location i finding out about the existence of a job vacancy in location j . First, the spatial extent of that individual's job search activities; and second, the spatial extent of information about the job vacancy. Three further factors determine whether that individual will end up in that post once they have found out about the existence of the job vacancy. First, whether they apply for the job once they have found out about it; second, whether they are offered the job; and third, whether they accept the job offer.

The logic behind hypothesis ten therefore has two weaknesses associated with it. First, it does not differentiate between information availability across space, individuals' job search behaviour and employers' recruitment behaviour. It may be the case that information about job vacancies becomes less readily available the further one moves from the location of the job or, alternatively, it may be the case that job seekers do not have the means to find out about more distant job vacancies, for example due to travel costs or localised geographical perspectives. Furthermore, job seekers may apply for distant jobs but they are not hired due to employers preferring to employ local people. However, the qualitative elements of this research shed some light on the relative importance of job search behaviour, the availability of information and recruitment behaviour as spatial barriers to employment.

The second weakness associated with hypothesis ten is that new recruits may live closer to the firms because of 'intervening opportunities'. In other words, they may have a choice of whether they work close to home or further afield and rationally choose the former. Detailed information on the location of jobs applied for by individuals, and which one was accepted, would need to be collected to unequivocally answer this

question. However, in a situation of labour surplus in most metropolitan rings as well as in the cores (as is the case of the Glasgow conurbation), it is unlikely that job seekers, particularly those looking for blue-collar work, are faced with an abundance of jobs to choose from. Similarly, information on the residential addresses of applicants to a firm could be usefully compared against the pattern of those actually offered employment. However, in order to differentiate between the behaviour of employers and the behaviour of job seekers, these data would need to show the spatial pattern of applicants, those who were offered a job and those who accepted a job. Similarly, data relating to job seekers would need to show the spatial pattern of jobs applied for, those offered and those accepted.

This level of detail in data collection and analysis, however, would go beyond the scope of this research which primarily seeks to test the spatial mismatch hypothesis, and gather information on the relative importance of commuting, migration and job search/recruitment processes, without investigating the precise mechanisms of the latter. Job search and recruitment as spatial barriers to employment depend on the *behaviour* of job seekers and employers and the information structures which exist between them. This is in contrast to the nature of commuting and migration barriers which are to a greater extent, although by no means entirely, dependent on the *physical form* and size of metropolitan areas.

8.3 Hypothesis ten: new recruits tend to live closer to the firms' new sites than retained staff

This section presents evidence which tests hypothesis ten. The distance commuted by members of retained staff to the firms' new sites is presented in order to reflect the maximum tolerable commute for particular people to particular types of jobs. This is compared against the commutes of new recruits in order to assess whether or not people who go through normal job search and recruitment processes end up with jobs as far from home as they could potentially commute. Thus, the results presented here show the aggregate outcome of job vacancy advertisement, job search, job application, employers' job offers and job seekers' job acceptances, but do not distinguish between these different stages in the process.

Table 8.1 shows the mean commutes in generalised minutes to the firms' new sites of members of retained staff and new recruits. As with the analyses presented in chapters six and seven, the 'mode weighted' columns indicate the amount of commuting actually undertaken, therefore is the most appropriate column on which to base the comparison of retained staff and new recruits. Table 8.1 has been disaggregated by occupational group²⁷.

Table 8.1 Mean commutes of retained staff and new recruits to the firms' new sites, by occupational group (generalised minutes).

Occupational group	Retained staff				New recruits			
	Car	PT*	MW*	<i>n</i>	Car	PT*	MW*	<i>n</i>
Professional	65	131	65	7	.	.	.	0
Managerial/technical	63	144	68	43	64	151	67	14
Skilled non-manual	58	136	76	67	48	118	56	22
Skilled manual	58	147	63	22	43	120	57	21
Semi-skilled	61	163	77	19	46	96	60	10
Unskilled	28	110	110	1	33	100	66	4

* PT = Public transport; MW = Mode weighted, i.e. takes account of individuals' mode of transport.

In comparing the mean commutes of retained staff and new recruits, it is clear that retained staff commute further than new recruits, particularly to less skilled jobs. There is no difference, however, between the commutes of retained staff and new recruits in the professional and managerial/technical occupational categories. This suggests that 100% of commutable space is penetrated by these workers' job search activities. This is

²⁷ The data in table 8.1 are presented by occupational group to avoid a bias which can be explained as follows. Lower-skilled groups have greater staff turnover, as reported by the firms in this study. Therefore, because a time frame is involved in drawing the distinctions above (recruits are 'new' if recruited since the relocation), lower-skilled workers will be over-represented among new recruits compared to the composition of the firms' workers at a point in time. Because lower-skilled workers live closer to work, and lower-skilled workers are over-represented among new recruits, the overall mean commute of new recruits would be biased downwards. Making comparisons of retained staff and new recruits of the same occupational group avoids this problem. Having said this, the differences between occupational groups' commuting is not immediately apparent in table 8.1, with the exception of the unskilled category who have consistently short commutes when expressed in terms of car travel. However, unskilled workers are heavily reliant on public transport therefore their mode weighted generalised travel time is not lower than other groups'.

consistent with the fact that these groups are more likely to find out about job vacancies through the mainstream press (Bohelt and Taylor, 2001) which provides information in a spatially comprehensive manner.

For all the other occupational groups, there are significant differences between the commutes of retained staff and new recruits. This provides some support for hypothesis ten.

Remember that the relationship between the commutes to the firms' new sites of retained staff and new recruits illustrates the degree to which job search and recruitment processes penetrate the potential commuting catchment of job seekers. For example, the skilled non-manual category shows new recruits commuting 74% of that commuted by members of retained staff (56 compared to 76 generalised minutes). This suggests that 74% of maximum commutable distance is penetrated by job search and recruitment (or 55% of commutable *space*, as this is reduced by the square of distance). The penetration of commutable distance (space) figures are 90% (81%) for skilled manual workers, 78% (61%) for semi-skilled workers and 60% (36%) for unskilled workers. Note, however, that these figures for unskilled workers are based on data from only one member of retained staff and four new recruits.

Some members of retained staff will have had their commutes shortened by the firm relocations, while others will not have had their commute lengthened by a sufficient amount to take them to their maximum tolerable commute for the job they hold. Therefore, it may be more appropriate to consider an upper percentile commute of members of retained staff, rather than means, in order to provide an accurate representation of the *maximum* tolerable commute to a certain type of job, since it is only the members of retained staff who have the longest commutes to the firms' new sites who have had their commutes 'stretched' close to 'snapping' point.

Skilled non-manual new recruits' 75th percentile commute is 83% of skilled non-manual retained staff members' 75th percentile commute. For skilled manual workers, the figure is 87% and for semi-skilled workers it is 85%. (There are not enough observations of

unskilled members of retained staff to calculate the 75th percentile). This provides further evidence that hypothesis ten can be accepted.

It should be borne in mind, of course, that people's job search areas are likely not only to be determined by the availability of information but also by the anticipated ease of commuting to a job. Indeed, some interviewees reported only applying for jobs that were easily commutable by bus. These were usually local jobs and city centre jobs. Job search areas are thus influenced by transport times and costs. This illustrates that people's job search behaviour is influenced by the perceived commuting costs and times, and the frequency and reliability of public transport services.

A caveat to these results is that members of retained staff may tolerate a long commute to a job they know and like; whereas someone considering *applying* for a similar job with a similar commute does not have experience of the conditions in that particular job, and so might decide against the job on the grounds of the long commute. Therefore, the commutes of members of retained staff may overstate the amount of travel people would be willing to undertake to a new job.

The following section presents some qualitative and quantitative findings in relation to the spatial extent of people's job search. The subsequent section provides qualitative information on how the firms advertise job vacancies and recruit staff and the spatial extent of these activities.

8.4 Job search as a spatial barrier to employment within the Glasgow conurbation

The fact that members of retained staff travel further to work than new recruits suggests that people are willing and able to bear commutes longer than that which people searching for work end up with. This points towards something in the way in which people search for work and/or are recruited which limits the spatial extent of job vacancies available to them. This was addressed in the qualitative interviews with retained staff, leavers and new recruits. People were asked where geographically they search for work, what information channels they use, and how far they would be willing to travel to work. Before the results of these interviews are reported, however, it is

important to consider the spatial nature of different information channels that people use to find out about job vacancies.

8.4.1 The spatial nature of different job search information channels

The information channels used to find out about job vacancies by different groups of workers is important in understanding job search as a spatial barrier to employment. Specifically, some information channels provide potential access to information about job vacancies over a wide geographical area while others may only provide information about local jobs.

Newspapers, trade magazines and employment agencies provide information which is more or less spatially ubiquitous, at least within a metropolitan area. Exceptions may be localised free-sheet newspapers, and some people may face constraints in travelling to a retail outlet which stocks a specialist trade magazine, or may face constraints faced in travelling to an employment agency which is likely to be located in the city centre. Trade magazines are likely to be accessed in a current workplace which subscribes to it therefore may be more important to people searching for work while in employment.

Job Centres and word-of-mouth, however, have strong spatial elements to them. A number of Glasgow Job Centres were contacted by telephone and asked what their strategy was for displaying vacancies on the vacancy boards. All stated that they would place postcards advertising local and city centre jobs, but that they had access to a national database of current notified job vacancies which could be searched if a job seeker asked about the possibility of work in another city or region. It was not made clear how actively job seekers are aided in job search. It may be that this is restricted to initiatives for the long-term unemployed such as Job Club and the Gateway and 'follow-through' elements of the New Deal. Thus, Job Centres provide information about job vacancies non-uniformly across space in two respects. First, the proximity of the local Job Centre may influence how often job seekers visit the Centre. Second, once at the Job Centre, the vacancies post-carded are local or city centre.

Word-of-mouth is also likely to be spatially restrictive because it reinforces existing commuting patterns. Webster (1994) showed that the proportion of a particular area's residents who work a certain distance from their home area diminishes with distance from that area. Thus, if people find out about a job from a family member, neighbour or friend who lives locally, then it is more likely to be a local job than one further away. Some friends and family who do not live and/or work locally may, however, be the source of information about jobs further afield.

8.4.2 The spatial extent of job search behaviour

The interviews showed a clear relationship between socio-economic group and job search behaviour. Those searching for higher skilled employment commanding higher salaries reported that they search over larger spatial areas when looking for work.

People looking for professional and managerial/technical jobs tended to look for work over a wide geographical area, usually most of the Glasgow conurbation, although some would be wary of taking a job on the other side of the conurbation, particularly if it required crossing the River Clyde, the routes across which some interviewees reported as tending to be heavily congested during peak traffic periods. The information channel used the most often by professional and managerial/technical workers was the national press. For managerial/technical workers, employment agencies were also important. Members of these groups typically said that an hour to an hour-and-a-half would be the maximum they would be prepared to commute, although this would be reduced if they had to travel by public transport.

People in the skilled non-manual and skilled manual categories typically reported looking for work over fairly wide areas, but not extending to the whole conurbation. Often a preference was expressed for work in central Glasgow, the segment of the conurbation in which they live and along key transport corridors (both highway and public transport). The constraints of getting children to and from relatives who look after them during work hours were sometimes mentioned. People in skilled non-manual occupations often said they used employment agencies and the Job Centre to find out about job vacancies. Some skilled manual workers reported finding out about their

current job through word-of-mouth and using specialist trade magazines when searching. A few interviewees mentioned applying for jobs at places of work where a friend or relative works. For example, one of the leavers who had found a new job had been told about it by a former colleague:

"Someone from xxx [relocated firm] told me they were looking for work. They'd been laid off and had gone there so just told me to phone up an' say I'd been at xxx."

[Leaver, production operator, late 20s, got a lift to the old site, travelled by bus initially to the new site]

This is considered a 'safe bet' because people get insider information about the firm's recruitment criteria and have some information about the conditions of work. It is also a costless means of getting information about job vacancies, if a low intensity method. One employee reported that the press was "pretty useless" for finding skilled manual work in the food industry. He relied on word-of-mouth from friends in the trade as well as the Job Centre. Members of the skilled non-manual and the skilled manual occupational groups typically reported that up to an hour would be the maximum time they would be prepared to spend commuting to their current job.

People in semi-skilled and unskilled occupations often reported looking for work along a transport corridor between the centre of Glasgow to an unspecified point beyond where they live. These occupational groups relied heavily upon the Job Centre when searching for work, although many said that a friend or relative who works for their current employer encouraged them to contact that employer prior to them being offered a job. Often the friend or relative would recommend them to the employer when they knew their employer to have job vacancies. Responses to being asked about how far they would commute to their current job varied from 10 minutes or "not very far at all" to an hour or "as far as it takes". Some people only mentioned the town in which they live, for example "Just round here in Motherwell". Part time workers highlighted that it was not worthwhile having a long commute as it took their effective pay rate down to as little as two or three pounds per hour, and commuting time would be considerable relative to amount of time they spend at work.

The source of information used when searching for work is pertinent to how local labour markets operate spatially, since different information sources make job vacancy information available across space to varying degrees. Information channels used were asked for in the questionnaires of new recruits and leavers. The results are shown in table 8.2. New recruits reported the information source they used to secure the job they are currently in, whereas leavers reported any information source they would use when looking for a job²⁸. Therefore, new recruits' information sources were all successful in getting them a job, whereas not all leavers' sources are successful. This allows a comparison to be made of the job search channels used by those marginalised in the labour market with the channels which actually yield jobs.

Table 8.2 Job search channels of new recruits and leavers

Job search channel	New recruits		Leavers	
	%	<i>N</i>	%	<i>N</i>
Job Centre	17	12	31	4
Newspaper	26	18	23	3
Speculative inquiry	1	1	8	1
Word-of-mouth	39	27	23	3
Trade magazine	3	2	.	0
Employment agency	13	9	15	2
TOTALS:	100	69	100	13

Word-of-mouth is the most successful information source for getting a job, accounting for 39% of recruitment. However, only 23% of leavers' responses were 'word-of-mouth'. Leavers have a much greater reliance on the Job Centre – 31% of leavers' responses compared to 17% of new recruits having found their job from the Job Centre.

²⁸ A note of caution in comparing new recruits' and leavers' job search channels should be sounded. New recruits were asked how they found out about their job, but leavers, because not all are in employment, were asked which channels they use when searching for work in general. Therefore, new recruits only ticked one box but leavers could tick as many boxes as applied. The new recruits' column is percentages of respondents but the leavers' is percentages of responses. Thus, if new recruits had been invited to state all information sources they used in searching for their job, then their responses may have been less different to leavers'.

Differences between occupational groups in job search channels are significant, as was apparent from the qualitative interviews. The Job Centre is not used by any of the professional or managerial/technical workers in the sample, with the newspaper being the most important means of job search for these groups, being used by over 40% (6/14) of the members of these groups. Skilled non-manual workers use a variety of search channels, but use word-of-mouth less than all other occupational groups, with less than one-in-five (4/23) citing this method compared to over two-in-five (30/74) overall. In contrast, skilled manual workers rely heavily on word-of-mouth, with nearly two-thirds (13/21) of workers in this category citing this method. The semi-skilled and unskilled groups rely mostly on the Job Centre and word-of-mouth, with 15 out of 16 respondents citing these methods, and only five out of 16 citing any of the other methods. This is significant, as these are the groups which bear a disproportionate amount of unemployment, and use the two most spatially restrictive information channels to find work.

The managing director of one of the firms in the sample spoke, unprompted, about how people he recruits generally search for work. These comments, reproduced below, were in relation to semi-skilled and unskilled manual jobs in electronics assembly, mostly filled by women:

"A lot of people who worked here [prior to the firm's relocation] have a very limited view of the world. The other side of the M8 might as well be another planet. They wait for their pal to get a job somewhere, and then they'll start [with the same employer]"

This type of territorial localism was apparent in the interviews when interviewees were asked if they had considered moving house to be closer to work, as reported in the previous chapter. Often this question was treated with incredulity, particularly by women, since the interviewee had lived in the same neighbourhood all their life and the thought of living anywhere else within the Glasgow conurbation had apparently never so much as crossed their mind. It appears that for lower-skilled groups, particularly women, restricted cognitive spaces and spatially localised geographical perspectives spill over into their job search behaviour.

Anecdotally from this research, men appeared to be less likely to report in interviews that they were born in the neighbourhood in which they currently live, possibly due to couples being more likely to live close to the female partner's parents (and hence the neighbourhood in which she was born). Men appear to prefer to present themselves as more 'worldly', which of course is easier for them to do since they are less constrained by the necessity to care for children and dependent relatives. However, whether this 'worldliness' translates into significantly more extensive job search areas in practice is another question.

In summary, those with the lowest skills, particularly women and those dependent on public transport, appear to have the most spatially restricted job search areas. This is partly a realistic response to constraints on how far they can reasonably commute, but is also due to 'territorial localism' resulting from restricted cognitive spaces. However, even if unskilled groups' job search areas were spatially more extensive, would they get hired by distant employers? This is the subject of the final section of this chapter.

8.5 Recruitment as a spatial barrier to employment within the Glasgow conurbation

There are two distinct elements to the recruitment behaviour of firms which may favour local people, and thus contribute to space as a barrier to employment from the point of view of the job seeker. First, there is the question of how much spatial coverage is achieved by the means by which firms advertise their job vacancies. Second, the criteria which firms use in making recruitment decisions may have spatial implications by either directly or indirectly favouring people who live locally. For example, it has been suggested that firms value recommendations from existing employees (Fernandez and Weinberg, 1996), who may tend to live locally and recommend friends and relatives who also tend to live locally.

8.5.1 *Spatial coverage of job vacancy advertising*

Apart from professional and managerial/technical positions which tend to operate in the sphere of regional and national labour markets rather than local labour markets, the firms interviewed for this research generally used the Job Centre as the first element in

their strategy for filling job vacancies. The main benefit of this is that it is a low cost method of recruitment. In addition, in some cases the Employment Service would provide initial screening of applicants free of charge. This is not common practice by the Employment Service (although it is becoming more so), and was usually offered as aid with the firms' relocations. Interestingly, this is a tacit acknowledgement that the firms lost staff as a result of their relocations. As noted in the previous section, Job Centres do not provide information in an accessible form across a wide spatial area (although the Employment Service is in the process of introducing job search facilities which are likely to reduce this effect). However, the firms' reliance upon Job Centres to fill vacancies illustrates the adequacy (from the firms' point of view) of the spatial extent of advertising currently achieved by Job Centres.

Some of the smaller firms interviewed in the course of this research said they placed cards on local supermarket notice boards advertising job vacancies. As noted previously, this is obviously a spatially restrictive form of information provision. This method tended to be used mostly for lower-skilled positions.

Some of the firms expressed frustration at the low quality and inexperience of people referred to them by the Employment Service. These firms, as well as most of the others, said that they valued existing employees' recommendations as, in their experience, the people recommended generally made good workers who 'fitted-in' with the firm. These firms would on occasion proactively seek the assistance of valued employees in 'asking around' for suitable people looking for work.

Only when the local Job Centre and other low cost means of local advertisement of job vacancies had failed would firms then advertise in trade magazines. This was usually only necessary for skilled manual positions, particularly those with supervisory responsibility, and not for skilled non-manual and unskilled positions, which firms generally found easier to fill.

In contrast, professional and managerial positions were generally advertised in trade magazines and/or the mainstream press. Firms making use of these more spatially

ubiquitous information sources reflects the larger spatial scales at which these more specialised segments of the labour market operate.

8.5.2 Spatial implications of recruitment criteria

Several of the firms reported a preference for recruiting people recommended by existing employees as they felt that such people are more likely to be suitable, as noted in the previous section. This will serve to reinforce the existing commuting field around the firm in question. Since commuting patterns illustrate negative exponential distance decay (Russo et al, 1996) and the people referred are likely to be friends and family who tend also to live locally, this method of recruitment will be less likely to reach people who live further afield.

In addition, a number of the firms interviewed for this research expressed a direct preference for recruiting local people. This was because the firms thought locals would be more likely to stay with the firm for longer, be more punctual and be able to do overtime at short notice.

8.6 Summary and conclusions

This chapter has shown that people when recruited by employers, live slightly closer to that employer than they could potentially commute. This suggests that they may not find out about more distant job vacancies. Given overall labour surplus across the vast majority of the Glasgow conurbation, this is unlikely to be due to people being able to reject job offers which would entail a long commute. Therefore, hypothesis ten – *new recruits tend to live closer to the firms' new sites than retained staff* – can be accepted. However, job seekers anticipate transport costs and times when deciding over what spatial area to search for employment, so commuting cost and time interact with job search areas.

Some groups within the labour market have restricted cognitive spaces, resulting from spatial immobility and a territorial localism. This appears to contribute to forming restricted spatial job search areas among lower-skilled groups. Some people lack the

confidence to approach unknown employers, often preferring to start a new job with a firm where they know an existing employee.

Information channels used by lower-skilled groups when searching for work also tend to be those which are the most spatially restrictive such as word-of-mouth and the local Job Centre. This, however, may be as much a reflection of the methods used by employers to advertise and fill lower-skilled job vacancies as it is of the innate behaviour of lower-skilled job seekers themselves.

Since there is labour surplus for most blue-collar and lower-skilled occupations, employers can recruit to these positions mainly by the use of the local Job Centre, cards in the local supermarket and by asking for recommendations from existing employees. These three means of advertising and filling job vacancies tend to localise information availability. However, this research, being based in one metropolitan area at one point in time, is unable to investigate how much firms' recruitment behaviour is likely to change given different labour market circumstances. It is reasonable to assume that when faced with labour shortages, firms will be more proactive about disseminating job vacancy information across a wider spatial area in order to reach a greater number of potential recruits.

Some firms favour recruiting people recommended by existing employees. This will reinforce existing (often localised) labour sheds around employers. Some firms interviewed for this research also expressed a direct preference for locals because they may be more reliable and flexible in time-keeping and work patterns, and are more likely to stay with the firm for longer. Again, however, firms may alter this preference when faced with recruitment difficulties in tighter labour markets than that found in the Glasgow conurbation.

As with commuting fields and residential mobility, lower-skilled workers come at the 'bottom of the heap' in terms of the spatial extent of their job search activities, the spatial availability of job vacancy information and the need of employers to recruit widely across space. Low skills compound spatial barriers to employment.

This chapter has shown that there are spatial restrictions on job search, job vacancy information and firms' recruitment practices, and that these are slightly greater than commuting as a spatial barrier to employment, although the two reinforce each other. In the face of employment deconcentration within the Glasgow conurbation at a greater rate than population deconcentration, this will contribute to the higher incidence of unemployment in the inner than the outer parts of the conurbation, and to the overall higher unemployment rate in the core than in the ring.

This chapter concludes the results section of this thesis. Overall, the results have shown that there are commuting, residential mobility and job search/recruitment barriers to employment within the Glasgow conurbation, but that they are largely restricted to lower-skilled groups, particularly lower-skilled women and those dependent on public transport. Given that jobs have deconcentrated at a greater rate within the Glasgow conurbation than population and thus there is a lower effective availability of jobs per worker in the core than previously, these spatial barriers to employment offer a partial explanation of the spatial pattern of unemployment found in the Glasgow conurbation.

However, it is important to stress that higher skilled and higher income workers and car owners do not experience significant spatial barriers to employment within the Glasgow conurbation. Spatial barriers to employment are almost entirely restricted to lower-skilled and public transport dependent groups within the workforce. Low skills compound spatial barriers to employment.

The following chapter assesses the findings of this research in terms of the implications for current understanding of urban unemployment and policies to deal with it. The effectiveness of the firm relocation methodology to test the spatial mismatch hypothesis is also reflected upon.

PART IV – DISCUSSION AND CONCLUSION

9. DISCUSSION

10. CONCLUSION

9. DISCUSSION

9.1 Introduction

Extensive literature search has only found one existing study that tests the spatial mismatch hypothesis using a firm relocation methodology (Zax and Kain (1996), studying Detroit). This study is one of the first to explicitly consider the spatial mismatch hypothesis in relation to a metropolitan area in Britain. Furthermore, it appears to be the first study, either in the US or elsewhere, to examine the nature and extent of different types of spatial barrier to employment in detail.

This chapter compares the findings of this research against those of Zax and Kain (1996) and goes on to compare the findings against other previous spatial mismatch work more generally. In so doing, gaps remaining in knowledge and questions raised by this work are identified. The effectiveness of the firm relocation methodology is assessed and the implications for methods used in future research into the spatial mismatch hypothesis are assessed.

The chapter goes on to discuss how the findings of this research relate to existing broader understanding of the spatial distribution of unemployment within metropolitan areas, in particular the implications for the concepts of 'skills mismatch' and 'spatial mismatch' within metropolitan labour markets. Consideration is then given to the implications for how we conceive of the risk of unemployment faced by individuals and faced by people in different geographical areas. Gaps remaining in knowledge about explanations of the spatial distribution of unemployment within metropolitan areas are highlighted as areas for possible future research.

The implications of the findings for urban regeneration initiatives, urban policy, policies to deal with unemployment, and transport policy, are discussed. The implications for attempts to regenerate neighbourhoods in Glasgow which suffer from high rates of unemployment are outlined, as well as the implications for economic development and planning policies in the city.

9.2 Assessment of findings

9.2.1 The overall impact of the firm relocations

This research showed that, after an average of 23 months since the firm relocations, approximately 6-12% of workers left their jobs because their employers relocated within the Glasgow conurbation. This is within the range of a probit estimate that 11.3% of black workers quit their jobs because of a firm relocation of 18 minutes by car within Detroit (Zax and Kain, 1996), although no estimate for white workers was presented.

Around half of the leavers in the Glasgow study were unemployed or economically inactive after an average adjustment period of 31 months. The impact on leavers is consistent with Kasper (1973) who found that the unemployment rate among people who were involuntarily rehoused within Glasgow (another example of a 'natural spatial experiment') rose in the period after being rehoused.

Previous studies into the spatial mismatch hypothesis in the US typically show that around 10% of the cross-sectional spatial variation at a point in time between neighbourhoods' unemployment rates can be accounted for by spatial variation in accessibility to employment. For example, Immergluck (1998b) calibrated a number of models in which the job proximity measures accounted for approximately 10-20% of the spatial variation in neighbourhood employment and unemployment rates within Chicago. That these figures overlap with the 6-12% range of relocated workers in this study, and that a similar proportion of black workers in Zax and Kain's (1996) firm relocation study in Detroit left their jobs because of the journey to work, provides indirect support for the validity of Immergluck (1998b) and similar results of previous spatial mismatch research.

However, 6-12% of workers leaving their jobs when their employers relocate within a metropolitan area does not necessarily translate to 6-12% of the spatial variation in unemployment rates across a metropolitan area being attributable to variable accessibility to jobs. This translation depends on the extent of employment deconcentration compared to population deconcentration and the extent to which the 6-12% of the workforce who face significant commuting constraints are spatially

concentrated in particular neighbourhoods within a particular metropolitan area. Nevertheless, this extent of consistency in results between studies using fundamentally different methodologies provides a degree of verification of the findings of both.

This study showed that, of those who secured alternative employment after leaving their job, around a quarter went on to lower pay than in their previous job. Kasper (1973) also found that the earnings of those rehoused in Glasgow fell in the period after rehousing. Both these findings show that people in some locations are more restricted in commuting to lower-paid jobs than people in other locations. More significantly for the spatial mismatch hypothesis, this finding perhaps reflects the fact that pay in some workplace locations may be lower because there is a greater surplus of suitable labour available locally compared to other locations.

Also, in this study, the people who left or considered leaving their jobs because of the firm relocations were more likely to be women, lower-skilled, lower-paid and/or dependent on public transport than workers as a whole. This is consistent with the findings of Fernandez (1994) who showed prior to a firm relocation in Milwaukee that the relocation was going to impact the most, in terms of the change in commuting, on lower-paid blue-collar workers and women.

The findings of the Glasgow work are consistent with the deconcentration of employment within the Glasgow conurbation over recent decades having resulted in higher unemployment and lower wages in the core. This interpretation is reinforced by the fact that employment deconcentration has been greater than that of population, resulting in a lowering of the number of commutable jobs available per worker in the core of the conurbation over time.

9.2.2 Commuting as a barrier to employment

Evidence from this study (in addition to the overall impact of the firm relocations) that the journey to work presents a barrier to employment, is that those who had (or would have had) the longest commutes to the firms' new sites were more likely to leave or consider leaving their job because of the journey to work. In addition, those who had

their commutes lengthened the most by the firm relocations were more likely to leave or consider leaving their job because of the journey to work. Overall, 41% of the original workforce and 31% of workers recruited at the firms' new locations cited the journey to work as a reason for leaving or considering leaving their jobs.

The results of this work show that it is important to differentiate between geometric spatial mismatch and people's ability through mobility to overcome the physical separation between home and workplace. Those most at risk of leaving their job because of the journey to work in this study were not those who lived geometrically the furthest from the firms' new locations. Rather, they were those more dependent on public transport, and therefore were less able to commute a certain distance than car travellers. This is consistent with the findings of Shen (1998) who calculated accessibility indices for car and public transport travel in Boston. Shen found that the difference between car and public transport travel times to a given point from a particular neighbourhood was generally greater than the difference between travel times to that point from suburb and central city. In other words, mode of travel is more important in determining personal accessibility than the location an individual lives within Boston. The importance of private motorised transport in gaining access to employment in US metropolitan areas was also highlighted by Taylor and Ong (1995) who showed that access to a motor car was more important in explaining the likelihood of an individual being unemployed than the geographical proximity of jobs. These findings are particularly salient in the case of Glasgow City where only 34% of households had a car in 1991, significantly below the Scottish average of 57% of households, and also lower than the 58% of households in the ring of the Glasgow conurbation who have a car. In the other metropolitan cores in Britain, 49% of households had a car in 1991.

Access to private transport is not the only determinant of people's ability to commute greater distances. The propensity to leave or consider leaving employment because of the journey to work was modelled as part of this research. This showed that the level of pay received is important as well as mode of travel (although of course income itself can facilitate the purchase of a car). Thus, lower-skilled groups and part time workers who

generally receive less pay face greater constraints on how far they can commute. These factors combine with logistical problems associated with childcare to mean that women are generally more adversely affected by commuting as a barrier to employment than men. However, the change in commute induced by the firm relocations was more powerful in predicting propensity to leave because of the journey to work than any of the characteristics of workers.

Zax and Kain (1996), in their firm relocation study in Detroit, calibrated probit models of quit probability which showed that earnings have a strong impact on quit rates, consistent with the findings of this research. The other significant variables in their model, however, show some differences with this work. Notably, Zax and Kain found that the age of workers is a powerful explanation of quit probability, with younger workers being more likely to quit than older workers. In addition, they found that the length of service with the firm significantly reduced quit probability. These differences between the work of Zax and Kain (1996) and this work can most likely be accounted for by small sample sizes used to calibrate the logistic regression models in the Glasgow work, rather than by any fundamental difference in the nature of commuting as a barrier to employment within Detroit compared to Glasgow. Indeed, the qualitative findings of the Glasgow work suggest that younger (although also older, but not prime working age) workers and length of service with the firm *do* have a strong bearing on workers' decision of whether or not to leave their job.

The finding that commuting forms a barrier for some groups of people to employment within the Glasgow conurbation raises the question of how people may be able to overcome that barrier. Some means by which people overcome difficult commutes were mentioned in a number of the qualitative interviews carried out as part of this research. Examples included learning to drive, buying a car and arranging lifts with family members or work colleagues. However, the precise extent of these and problems associated with them, particularly lift-share arrangements, remain largely unknown. Given the environmental pressure to increase average car occupancy, particularly on the journey to work, research into the logistics of lift-share schemes may be useful.

Research attention could also be applied to how to increase transport mobility generally, and to assessing the social and economic benefits of so doing.

9.2.3 Residential mobility as a barrier to employment

The results of this work show that few, if any, workers made residential moves in order to be closer to work after the firms relocated. The residential mobility rate of the original workforce was identical to that of people recruited at the new site, although a small number of movers said they would *not* have moved house had their employer not relocated. Given that some groups were unable to commute to the firms' new sites, the fact that the original workforce's residential mobility rate does not rise suggests that migration to be closer to work is not a viable option in order to overcome commuting constraints. This interpretation is based on a small number of observations, but is reinforced by qualitative findings which show that strong neighbourhood ties are held by some manual and lower-skilled workers which reduce their willingness to move away from their current neighbourhood. Thus, low residential mobility forms a spatial barrier to employment within the Glasgow conurbation.

However, there is some evidence that when people are moving house in any case, they are able to take the opportunity of moving closer to work. This evidence is based on small numbers of observations, however, and may be influenced by people moving to suburban areas for reasons of environmental quality and housing and only shorten their commute incidentally or only as a secondary consideration in their overall decision to move house. Therefore, certain people may, in the long run, be able to migrate closer to work in order to overcome commuting difficulties, but this study found some evidence that this is limited to higher skilled and higher paid groups who commute by car. Those who travel by public transport are less likely to move house to be closer to work partly because, being less mobile than car drivers, they have stronger neighbourhood ties.

Zax and Kain (1996) examined the move rates of black and white workers in the periods before and after the firm relocation from the CBD of Detroit in their study. They found no differences in whites' move rates, consistent with the work in Glasgow reported here. However, black workers who had their commutes lengthened were more likely to move

house than other black workers, suggesting that, at least in this context of black people in Detroit, the journey to work can form a 'push' factor in people's residential locational decisions. However, this finding may have been due to black people moving towards the suburbs partly for reasons of environmental quality while the majority of whites already live in suburban Detroit. In calibrating a probit model of the probability of an individual moving house, Zax and Kain (1996) found that the percentage of residents in the individual's 'home' area who commute by bus had a strong effect in reducing move probability. This is consistent with the findings of this research which showed that those dependent on public transport are less likely to move house to be closer to work. The only factor to be more important than the extent of bus commuting in Zax and Kain's model was age, with younger people being more likely to move, probably reflecting greater residential mobility among younger age groups for a number of reasons, such as household formation, rather than specifically to be closer to work. In contrast, age was not at all significant in the modelling work carried out on the data collected for this study, but this may be due to small sample size.

The residential moves made by people in the Glasgow study reported in this thesis hint at the journey to work being a 'pull' factor influencing where people decide to move to when they are moving house in any case, but it not being a 'push' factor in persuading them to move at the outset. However, this is based on a small number of observations, and could usefully be the subject of further research using more robust data. A question of particular interest is whether or not people who live in the central parts of British metropolitan areas are more likely to move to the suburbs if they work in the suburbs than if they work in the core. This research would shed light on the importance, or otherwise, of the location of employment in persuading people to live in British metropolitan areas.

9.2.4 Job search and recruitment as spatial barriers to employment

The results of this work show that people recruited at the firms' new sites live closer to the firms than they could feasibly commute if required. It is argued that this is evidence that people's job search and/or firms' recruitment behaviour do not penetrate all of people's potential employment fields or firms' labour sheds. This suggests that job

search processes, information availability about job vacancies and recruitment processes pose greater spatial barriers to employment than commuting. This is consistent with the findings of O'Regan and Quigley (1998) who showed that exposure to labour market information is more important in explaining an individual's risk of unemployment than the local availability of jobs.

As with commuting and residential mobility as spatial barriers to employment within the Glasgow conurbation, lower-skilled and lower income groups and those dependent on public transport are affected more strongly by job search and/or recruitment as spatial barriers to employment. From the point of view of job search, the qualitative interviews carried out as part of this research showed that territorial localism restricted the spatial and other horizons of members of lower-skilled groups and those dependent on public transport.

However, the analysis performed in the course of this research does not shed much light on the precise mechanisms by which information about job vacancies becomes available to people in different locations across space. In particular, it does not tell us about the relative importance of the intensity of job search vis-à-vis the spatial ubiquity of information disseminated by firms, or firms' recruitment criteria which may favour local people. However, a mild preference for locals was expressed by some of the firms interviewed in the course of this research.

The quantitative and qualitative analysis carried out for this study suggest that car ownership may play an important role in loosening geographical ties to neighbourhood, and in allowing people to adopt a more outward looking perspective in terms of job search and perhaps also in other aspects of their lives. Further research into the role of spatial mobility in influencing people's cognitive spaces and interaction with the wider community would be useful in order to explore these processes in greater detail.

9.2.5 The relative importance of different spatial barriers to employment

Overall, commuting and job search/ recruitment processes appear to be the most significant spatial barriers to employment within the Glasgow conurbation. Of these,

job search and/or recruitment processes are slightly more significant than commuting, but it should be borne in mind that the anticipated ease of commuting to different locations influences where people search for work. Residential mobility does present a substantial spatial barrier to employment, but to describe it as a barrier is perhaps a slight misrepresentation. Many people, certainly those who do not live in social rented accommodation, may be able to move house to be closer to work if they so desired, but they have no desire to do so owing to long-term ties to the neighbourhood and/or property, even when faced with a difficult commute which may result in unemployment or economic inactivity.

There are also indirect 'second round' effects to consider in the interactions between these three spatial barriers to employment. For example, in the past employers may have advertised in locations that are inaccessible by daily commuting to the jobs in question in the anticipation that people would move house to take up employment. However, if residential mobility presented a barrier to people doing this, then employers may no longer advertise job vacancies in these locations. Similarly, as noted above, people may restrict their job search to locations that they anticipate being able to commute to. Finally, if people do not move house in significant numbers to locations that entail long commutes, then public transport provision will not be laid on, thus preventing greater numbers of people from moving house to these locations. Therefore, to some extent, the three spatial barriers to employment examined in this thesis are likely to reinforce each other.

9.3 Assessment of the firm relocation methodology

This work utilised an innovative methodology designed to address the problems identified in chapter four of interpreting cross-sectional associations between proximity to jobs, skills and labour market outcomes. In particular, the firm relocation methodology as a natural spatial experiment introduces built-in controls with regard to the characteristics of the workers and the jobs. It also allows the relative importance of commuting, residential mobility and job search/ recruitment processes as spatial barriers to employment to be investigated. The firm relocation methodology also has the

advantage of being able to provide information on the processes operating through time which give rise to spatial variations in unemployment within the Glasgow conurbation.

However, there are possible competing interpretations of some of the findings from a firm relocation study. These are recapped here in relation to the three research objectives before this section concludes with a more general *post hoc* reflection on the main strengths and weaknesses of the firm relocation methodology.

9.3.1 Analysis of commuting as a barrier to employment

The firm relocation method assumes that if people leave their jobs because of the journey to work when they relocate, then this is evidence of commuting as a barrier to employment. The fact that an individual with a long commute chooses to leave their job does not, however, necessarily mean that they were unable to commute to their previous job. Rather, they may move into alternative employment closer to home in order to maintain a convenient commute.

This means that the local availability of jobs to an individual may influence their likelihood of leaving their job because it relocates. Thus, the firm relocation method would imply that commuting is a stronger barrier to employment in a tight (low unemployment) local labour market than it actually is, because workers would have alternative jobs to choose from. However, this effect would be diluted if employers in tighter local labour markets need to pay higher wages to attract workers from a wider labour shed to overcome commuting constraints. Therefore, it can be concluded that the firm relocation methodology is more appropriate in slack local labour markets where such spatial differentials in pay do not exist and there is not an abundance of alternative jobs for people to choose from. A similar issue arises in relation to firm relocation studies at different points in the economic cycle (Fernandez, 1993). Workers may be more inclined to leave their jobs at times when there are more alternative employment opportunities available generally.

Zax and Kain (1996) in their 1974 firm relocation study in Detroit, however, showed that the unemployment rate in the census tract of residence did *not* affect an individual's

likelihood of leaving their job. This implies that variations in the local availability of alternative employment opportunities does *not* affect individuals' propensity to leave their job because of the journey to work. However, note that this firm relocated in 1974, a time of economic recession, therefore alternative employment opportunities in Detroit may have been limited generally.

9.3.2 Analysis of residential mobility as a barrier to employment

The firm relocation method assumes that if an individual is *not* more likely to move house in the face of commuting difficulties, then this is evidence of residential mobility being a barrier to employment. However, an individual may be able to move house closer to work but chooses not to do so, for a variety of personal reasons, even if this means becoming unemployed or economically inactive. What prevents people from moving house may be subtle personal factors rather than 'real' financial, administrative or logistical 'barriers' to doing so. For example, the person may have close family in their neighbourhood and may have lived in their neighbourhood for a long time, so have no desire to leave. Whether these type of factors constitute mitigating circumstances which prevent people from moving house, or if they represent the essence of barriers to residential mobility, is open to interpretation.

This study also tested whether or not people with longer commutes are able to take the opportunity to shorten their journey to work when they move house in any case. The results showed that, in a small proportion of cases, they can and do. However, some of these households may be making residential moves to the suburbs for reasons of environmental quality and housing availability rather than to shorten their commute *per se*, although they may shorten their commute incidentally if they move to the same segment of the conurbation ring as their employer. Clearly this will be the case in some instances, but in others people may be persuaded to move to one particular part of the conurbation ring rather than another with reference to their workplace. Indeed, some of the qualitative interviews carried out in the course of this research suggested that this is how some people anticipate making future residential moves within the Glasgow conurbation.

9.3.3 Analysis of job search and recruitment as spatial barriers to employment

This analysis compared the distance commuted by workers recruited at the firms' new sites with the maximum tolerable commutes of members of retained staff. The logic behind this was that this would illustrate the degree to which job search and recruitment processes penetrate potential commuting catchments. This is an indirect measure of the outcomes of job search and recruitment processes in aggregate, without attempting to assess the processes themselves and the precise mechanisms through which information is accessed across space. Consequently, a particular weakness with this aspect of the firm relocation methodology is that we do not know if job searchers found out about jobs more distant than the one they took, and we do not know if local employers were more likely to choose to hire them.

Given the overall labour surplus in all parts of the Glasgow conurbation at the time of the survey, it is unlikely that job searchers would have a range of job offers from which to choose. In contrast though, employers may have a range of applicants from which to choose the most local. Therefore, it is not possible from the data collected in this survey to conclude whether job search behaviour or recruitment behaviour is more important in producing the observed spatial outcome, although it is fair to rule out job acceptance behaviour on the part of the job seeker as having a significant role, owing to labour surplus throughout the Glasgow conurbation.

This part of the firm relocation methodology is somewhat crude in its approach to job search and recruitment processes compared to previous work which has closely examined the locations of jobs applied for, jobs offered and jobs accepted from the point of view of the job searcher; and the locations of applicants, job offers and job acceptances from the point of view of the employer. However, previous work has not been conducted with particular reference to the spatial mismatch hypothesis.

The methodology used here has provided an indication of the extent of job search and recruitment as spatial barriers to employment within the Glasgow conurbation in comparison to commuting. The analysis showed that job search and/or recruitment

present marginally stronger spatial barriers than commuting. This is new knowledge with regard to the spatial mismatch hypothesis.

9.3.4 Overall assessment of the firm relocation methodology

A conceptual weakness with the firm relocation methodology is the difficulty it presents in generalising from the firm relocation or relocations in question to the impact of employment deconcentration on the workforces of metropolitan areas overall. The firm relocation methodology is good for examining the nature of specific spatial barriers to employment and can provide an overall test of the validity of the spatial mismatch hypothesis. However, it is less good for assessing the relative importance of skills versus spatial mismatch in explaining spatial variation in unemployment rates within a metropolitan area.

The main difficulty encountered in operationalising the firm relocation methodology in this study was generating sufficiently large sample sizes. A particular problem with regard to small sample sizes related to the number of leavers identified. This meant that the true number of leavers had to be estimated, which of course is subject to random error. In addition, since information was obtained from only eight leavers, their characteristics were proxied by using the characteristics of those who had considered leaving their job because of the journey to work.

The problems in identifying leavers resulted in large part from the fact that the firms were contacted after they had relocated, and so the research into the impact of their relocation was carried out retrospectively. The data collected from a 'before' and 'after' firm relocation study would have been more robust. However, it is difficult to design an effective and systematic method which would identify firms a sufficient length of time before they are due to relocate. In addition, it would be desirable to carry out the 'before' element a year or so prior to the relocation and continue the study for at least a year after in order to capture the full period of labour market adjustment. This type of approach would have been outwith the time initially available for this research. A further difficulty in setting up 'before' and 'after' firm relocation studies would be the likely commercial sensitive nature of disclosure that a firm was to relocate, or the

drawing of employees' attention to potential commuting problems by a researcher. In addition, firms may censor data in order to create a favourable image of themselves.

With hindsight, this methodology was ambitious within the time scale of this project. However, it has been a valuable exercise in assessing the relative merits of an innovative methodology to test the spatial mismatch hypothesis. It has shown that the methodology has potential for future research but researchers would be advised to, if possible, utilise a 'before' and 'after' study over a two to four year period in order to generate larger sample sizes and accurately identify leavers.

9.3.5 Issues for future research into the effects of spatial mismatch in other metropolitan areas

The research for this thesis was carried out in the Glasgow conurbation. However, it is possible that the extent and nature of spatial barriers to employment within other metropolitan areas are different.

A number of factors were identified in chapter four which are likely to influence the extent and nature of spatial barriers to employment within a particular metropolitan area in giving rise to a spatially uneven pattern of unemployment rates. Because this research was carried out in only one metropolitan area, the relative importance of each of these factors in creating, or reinforcing the effects of, spatial mismatch between the unemployed and suitable job vacancies remains empirically uncertain. It would be insightful for further research to investigate the impact of each of these factors on the spatial pattern of unemployment within different metropolitan areas. Indeed, the impact of these factors would also be of theoretical, as well as empirical, interest. In summary, these factors are:

- 1) the extent of employment deconcentration in comparison to population deconcentration;
- 2) the extent of spatial segregation of different socio-economic groups, and of those in social rented housing;
- 3) the car ownership rates found in different parts of a given metropolitan area;

- 4) the geographical size of a given metropolitan area; and
- 5) the slackness of the overall metropolitan labour market.

Chapters two and four assessed these factors in the Glasgow conurbation compared to the other eight metropolitan areas in Britain. In summary, the Glasgow conurbation has experienced employment deconcentration typical of the other metropolitan areas, and similar labour market responses to job loss as shown in labour market accounts. The City of Glasgow has a higher proportion than all the other metropolitan areas of its households in the social rented sector, and a higher proportion of households with no car. The results of this work show that low car ownership in particular will restrict the ability of people to commute from metropolitan cores to jobs in decentralised locations.

The Glasgow conurbation is slightly larger in terms of physical area than most of the other metropolitan areas, compounding the impact of employment deconcentration, although ameliorated by the fact that the conurbation has a reasonably comprehensive road and rail network. The slackness of the overall metropolitan labour market is similar to that for the other metropolitan areas as a whole.

The impact that each of these factors is likely to have on the nature and extent of spatial barriers to employment within metropolitan areas more generally is now considered in turn. First, the greater the extent of employment deconcentration in relation to population deconcentration, the fewer jobs will be available per worker in the core of the metropolitan area in question. This would mean that spatial mismatch itself would be greater, but this would not affect the extent to which people can commute *per se*. Rather, spatial *barriers* to employment would be the same in this scenario, but their *impact* would be stronger because of greater spatial mismatch on the ground between the location of workers and the location of employment opportunities.

Second, the degree of residential segregation of different socio-economic groups and those in social rented housing is likely to impact upon the extent to which space presents a barrier to employment within a metropolitan area. The greater the spatial concentration of lower-skilled groups, the greater the spatial barriers will be felt, for two

reasons. First, the section of the workforce who experience the greatest constraints on how far they can commute is concentrated upon lower-skilled groups in the workforce. If these people with restricted commuting catchments are scattered widely across a metropolitan area, then some of them are likely to live close to suitable jobs. In contrast, if they are concentrated in locations less accessible to employment, then the impact of commuting as a barrier to employment will be felt to a greater extent. In relation to social renters, they may experience additional constraints on their residential mobility to overcome commuting constraints due to administrative barriers to migration within the social rented sector. The second reason that residential segregation may increase spatial barriers to employment is that a concentration of lower-skilled groups who are more prone to unemployment in one area may restrict local information networks and limit the spatial job search horizons of residents.

The third characteristic of a metropolitan area which can be expected to influence the extent and nature of spatial barriers to unemployment is the level of car ownership. The greater the level of car ownership across a metropolitan area, the greater the mobility enjoyed by residents, thus they will be more able to overcome space as a barrier to employment. Indeed, the results of this work found that those who travel to work by public transport were more adversely affected than car travellers by space as a barrier to employment within the Glasgow conurbation. If car ownership rates are lower in the neighbourhoods which are the furthest from suitable job vacancies, then the impact of spatial mismatch will be reinforced.

Fourth, the greater the geographical size of a metropolitan area, the greater is the scope for spatial barriers to employment to become a problem. This applies to the physical size of the area, and to the cost and time required to cover a given distance. In all these respects, residents of inner London, for example, may face particular constraints on accessing employment in outer London, since London is physically larger and more congested than other metropolitan areas in Britain. Residents of metropolitan areas with less extensive transport infrastructure are likely to be similarly further affected by spatial mismatch between place of residence and the locations of suitable job availability.

Finally, the higher the wages paid across a metropolitan area, the more willing and able people will be to commute greater distances. Significantly, if employers in less accessible locations experience recruitment difficulties but those in more accessible locations do not, then the employers in less accessible locations may pay higher wages in order to attract staff from a wider labour shed. In other words, spatial differentials in workplace pay would allow people to overcome their commuting constraints, and would mean that spatial mismatch, while existing on the ground, would create less unemployment.

Taking this argument further, if a metropolitan area overall was approaching full employment, then unemployment would be low enough in all areas to mean that people would have the luxury of being able to choose short commutes rather than long commutes, and would allow people who face commuting constraints to obtain employment close to home. Thus, spatial barriers to employment are likely to be stronger in low wage metropolitan labour markets.

The impact of the above five factors on the extent to which space acts as a barrier to employment within different British metropolitan areas could form the basis of future research into the spatial mismatch hypothesis in Britain. This would further extend understanding of the nature of space as a barrier to employment, as well as provide an overall assessment of the magnitude of spatial mismatch as a problem in creating urban unemployment in the metropolitan areas of Britain.

This thesis has demonstrated the theoretical and methodological complexity involved in designing a robust test of the spatial mismatch hypothesis. Therefore, future research into the spatial mismatch hypothesis in Britain would benefit from bringing a variety of methods to bear on the hypothesis, utilising longitudinal and cross-sectional as well as quantitative and qualitative data. In addition, at least initially, it would be advisable to avoid the issue of racial differences in commuting and labour market outcomes which have caused considerable methodological difficulties in research into the spatial

mismatch hypothesis in the US. The hypothesis is of more general significance to understanding the spatial aspects of labour markets.

9.4 Implications of the results for current understanding of the spatial distribution of unemployment within metropolitan areas

9.4.1 Introduction

This section discusses the implications of the results of this work for current understanding of the spatial distribution of unemployment within metropolitan areas. As explained in chapter three, the skills mismatch perspective does not provide a direct explanation of why unemployment should be higher in certain parts of a metropolitan area rather than in others. Chapter three went on to show that by considering the changing spatial distribution of different types of jobs, a more complete and powerful conceptual model in which to understand the nature of labour markets in metropolitan areas can be utilised, incorporating insights from both urban economics and labour economics. This model includes interactions between skills mismatch, spatial mismatch, wages, commuting costs and house prices, within the context of segmented local labour and housing markets.

The discussion in this section of this chapter is focused on the relative importance of spatial and skills mismatches and the interaction between spatial and skills mismatches in explaining the spatial distribution of unemployment within metropolitan areas. Incorporating processes of residential choice from urban economics, and issues of segmentation and spatial frictions, it becomes apparent that it is vital to explicitly consider dynamic processes operating through time in order to understand the spatial distribution of unemployment within a metropolitan area.

In addition, as noted in the previous section, the characteristics of a particular metropolitan area will influence the extent to which spatial mismatch causes unemployment in the core of the metropolitan area, and therefore should also be taken into account. The characteristics which will influence this are: the extent of employment deconcentration in comparison to population deconcentration; the extent of spatial segregation of different socio-economic groups; the car ownership rates found in

different small areas; geographical size; and the slackness of the overall metropolitan labour market.

In understanding and tackling neighbourhood disadvantage, it is argued in this section that firmer differentiation is required between explanations regarding: 1) the spatial concentration of people with similar characteristics; 2) 'area' effects which influence people's behaviour or exposure to information; and 3) 'spatial interaction' effects regarding the physical relationship between a particular neighbourhood and the rest of the metropolitan area in which it is located.

This section then considers the implications of the results of this work for explanations of unemployment more generally. It is argued that greater differentiation needs to be made between theories which seek to explain: 1) the spatial distribution of unemployment; 2) the risk of particular individuals to unemployment; and 3) the overall national level of unemployment. It is argued that a more specific treatment of space is required in each of these models of unemployment. The policy implications of the findings of this research are discussed in the following section of this chapter.

9.4.2 Spatial and skills mismatches within metropolitan areas

The results of this work show that approximately 6-12% of the employees of firms sampled in this study face constraints on how far they can commute within the Glasgow conurbation. Given that 17%²⁹ of the workforce of working age in Glasgow in 1996 (the point around which many of the firm relocations in this study took place) was ILO unemployed, a large proportion of Glasgow's unemployed population could potentially face spatial barriers to gaining employment. By 2000, the proportion of Glasgow's workforce of working age that was ILO unemployed had fallen to 10.5%³⁰.

Indeed, the unemployed are likely to be generally less skilled, less mobile, more dependent on public transport, and more neighbourhood centred than the people in the sample for this research, on the basis that the latter are all either in, or have recently

²⁹ Source: Labour Force Survey

³⁰ Source: Labour Force Survey

been in, employment. Since this research has shown that people with these characteristics face stronger spatial barriers to employment within the Glasgow conurbation, the proportion of the *unemployed* in the Glasgow conurbation who face spatial barriers to employment will be significantly greater than 6-12%.

A key question is, 'where are the 6-12% of Glasgow's overall workforce who face commuting constraints located'? If they are located close to an adequate number of proximate jobs, then spatial mismatch between the unemployed and suitable jobs is *unlikely* to explain the spatial pattern of unemployment. However, if they are *not* located close to an adequate number of proximate jobs, then spatial mismatch is likely to result in unemployment in locations less accessible to jobs.

Spatial barriers to employment were shown by the results of this study to be concentrated among those with lower skills, lower pay and those dependent on public transport. These groups are over represented in the inner parts of the Glasgow conurbation, as shown in chapter four. Employment deconcentration from the core of the Glasgow conurbation over recent decades has been greater than population deconcentration, resulting in a reduced overall availability of jobs per worker in Glasgow's core. Since this is where the groups most affected by spatial barriers to employment are over represented, it is likely that employment deconcentration has contributed to the pattern of higher unemployment found in the inner parts of the Glasgow conurbation, and to the overall higher unemployment rate in the core than in the ring.

However, this raises the question of why lower-skilled groups who face the greatest spatial barriers to employment within the Glasgow conurbation are disproportionately located in the core of the conurbation in the first instance. Conventional urban theory tells us that this is because the income elasticity of housing space is greater than that of travel time (Alonso, 1964); in other words that as incomes rise, demand for more housing space rises faster than the demand for accessibility. This may be so, and in addition, industrial blight, particularly from derelict industrial sites, and an unbalanced

housing stock in favour of flats in the City of Glasgow, further serve to make the ring of the conurbation a more attractive residential option for many mobile households.

The residential attractiveness of the conurbation ring to higher income (and higher skilled) groups has implications for the skills profile of the core. Migration from the core to the ring of the conurbation is selective of those with higher skills, depleting the skills profile of the core. This is part of the process of the housing market concentrating together people with less sought-after skills to offer the labour market in certain inner urban locations. This is the argument presented in support of the skills mismatch perspective in accounting for the spatial distribution of unemployment within metropolitan areas.

The out-migration of higher skilled groups from metropolitan cores, however, does not alter the extent to which the people who remain in the cores experience spatial barriers to employment. Therefore, a key contribution made by this thesis is the demonstration that lower-skilled people face spatial barriers to employment within the Glasgow conurbation, a factor not hitherto included in the dominant skills mismatch explanation of the spatial distribution of unemployment within metropolitan areas. The fact remains that, *ceteris paribus*, had employment not deconcentrated from the core of the Glasgow conurbation, the differential between the unemployment rates found in the core and ring of the conurbation would be smaller than is currently the case.

Another point to note in relation to the skills mismatch perspective is that the results of this work show that, at least at the margin, a small proportion of residential moves within the Glasgow conurbation are influenced by the location of employment, thus the deconcentration of employment opportunities has contributed to the depletion of the skills profile of inner city neighbourhoods through the selective out-migration of higher skilled people to the suburbs. This shows the skills mismatch perspective to provide an incomplete account of the causes of the uneven distribution of skills within metropolitan areas.

This is not to imply that skills mismatch is not a key barrier faced by many unemployed people living in Glasgow City – it clearly is, given the level of net-in commuting to the City to high skilled jobs, particularly in the city centre. However, people with low skill levels command lower wages and are therefore more limited in how far they can commute, as shown by the results of this work. In addition, lower-skilled groups are less likely to be able to afford to run a car, therefore their spatial mobility is further reduced. Therefore, skills mismatch reinforces spatial mismatch.

Conversely, people who live in locations less accessible to employment opportunities are likely to suffer more frequent and longer lasting episodes of unemployment. Since work experience is valuable in developing skills (Fernandez and Weinberg, 1996), this means that spatial mismatch reinforces skills mismatch, as well as vice-versa. It is therefore somewhat simplistic to present skills and spatial mismatches in opposition to each other or in isolation from each other. Skills and spatial mismatches reinforce one another in creating barriers to employment faced by people.

This interaction between skills and spatial mismatches presents a problem for linear multi-variate models which seek to explain the relative importance of skills versus spatial mismatch. Because this research shows that higher skilled groups are less affected by spatial barriers to employment, this non-linearity needs to be taken into account. At the most basic level, skills and spatial mismatches need to be combined into an interactive term in such models, although this would have the disadvantage of reducing the amount of information obtained on the relative importance of each. On a more complex level, non-linear regression techniques could be employed to take account of this effect, for example log-linear models or Box-Cox regression which allows the degree of non-linearity between variables to vary.

9.4.3 Understanding neighbourhood disadvantage

The results of this work have shown that an individual's area of residence within the Glasgow conurbation will influence their employment prospects in two respects. First, the proximity of suitable jobs will influence the probability of people in a particular neighbourhood experiencing a spell of unemployment owing to commuting constraints

faced by some groups in the workforce. Second, the ways in which information is accessed about job vacancies by people who live in disadvantaged communities suggest that restrictive information and social networks in such communities reduce the probability of people finding out about a particular job vacancy. More pertinently, this probability diminishes the more distant the job vacancy is.

These factors illustrate that care must be taken in differentiating between 'spatial interaction' effects and 'area' effects in explaining the level of labour market disadvantage found in a particular neighbourhood. Spatial interaction effects relate to the physical relationship between the neighbourhood and the rest of the metropolitan area in which it is located. Area effects relate to the social interactions which take place within the neighbourhood and with the outside world.

The proximity of jobs to a neighbourhood constitutes part of the physical relationship between the neighbourhood and the broader metropolitan area in which it is located. The transport infrastructure connecting the neighbourhood to the rest of the metropolitan area is also important in determining the level and nature of spatial interaction between the neighbourhood and the rest of the metropolitan area. The impact of these comes under the umbrella of 'spatial interaction' effects.

The nature of information networks between residents of an area influences how they find out about jobs. Social relationships between residents influence their knowledge and attitudes about work and methods of searching for work (Immergluck, 1998a). The impact of these are often referred to as 'area' effects (O'Regan, 1998). It is argued that these effects mean that spatially concentrated socio-economic disadvantage presents a greater problem than spatially dispersed socio-economic disadvantage (Massey, 1996).

Therefore, the findings of this research suggest that in understanding the unemployment found in a particular neighbourhood, firmer differentiation is required between: 1) individuals with certain characteristics spatially concentrated together; 2) 'area' effects whereby individuals' behaviour or likelihood of being unemployed is influenced by the social relationships between people in a particular neighbourhood and with the outside

world; and 3) 'spatial interaction' effects regarding the physical relationship between a particular neighbourhood and the rest of the metropolitan area in which it is located, with particular reference to the proximity of jobs to that neighbourhood and the transport links from the neighbourhood to the rest of the metropolitan area in question.

9.4.4 Understanding unemployment

Since the findings of this research show that some groups of people face spatial barriers to employment within the Glasgow conurbation, this suggests that space needs to be given a more explicit treatment in models of unemployment. There are three broad types of model. First, there are those which seek to explain the spatial distribution of unemployment, such as the spatial and skills mismatch perspectives, (although the skills mismatch perspective is often applied to the explanation of unemployment more generally). Second, there are models which assess the risk of unemployment faced by different individuals. Finally, there are those models which seek to explain the overall level of unemployment, usually at the geographical scale of the nation state. The implications of the research findings of this thesis for these three families of model of unemployment are now outlined.

First, models which seek to explain the spatial distribution of unemployment need to consider the availability of jobs per worker in different areas. The *change* in jobs per worker may be more important, as previous work has shown that labour market adjustment mechanisms to job loss lag behind the scale of the job loss (Bailey and Turok, 2000). Spatial variation in the demand for labour is generally considered in explanations of inter-regional variation in unemployment. However, the results of this study show that the local availability of jobs should also be considered in explanations of *intra* regional variations in unemployment, including variations within metropolitan areas, because commuting constraints, residential immobility and restricted job search behaviour are concentrated upon groups prone to unemployment.

Second, the location of an individual needs to be included in models of the risk faced by different individuals to unemployment. Within metropolitan areas, this locational characteristic needs to be broken into two types of effects in order to differentiate

between 'area' effects and the effect of geographical proximity to suitable jobs. Since 'area' effects operate at the scale of the neighbourhood, this is the unit of geo-referencing required to capture 'area' effects. However, even those who face constraints on how far they can commute are not so restricted that they cannot commute outwith their home neighbourhood. Therefore, a larger geographical unit is required to capture the availability of jobs to residents. Better still, the geographical accessibility to employment across an entire metropolitan area or region from the point where the individual in question lives could be measured.

Finally, in explaining the overall level of unemployment at the level of the nation state, the spatial distribution of job vacancies in relation to the residential location of the unemployed needs to be considered. For example, this type of more macro work often analyses the relationship between the rate of job vacancies and the rate of unemployment in order to assess the balance between the demand and supply of labour in an economy. However, this may mask labour surpluses in some parts of a country co-existing with labour shortages in other parts. Overall, labour demand and supply may be in balance, but unemployment may remain in the face of job vacancies in the labour market.

9.5 Implications of the results for policies influencing the spatial distribution of unemployment within metropolitan areas

9.5.1 Introduction

This section discusses the implications of the results of this work for policies which influence the spatial distribution of unemployment within metropolitan areas. This relates specifically to the aspects of policy areas introduced in chapter two, namely: urban regeneration initiatives; urban policy; policies to deal with unemployment; and transport policy. Finally, issues raised by the results of this work for the co-sponsor of the research, Glasgow City Council, are discussed.

9.5.2 Urban regeneration initiatives

Urban regeneration initiatives in Britain have had a strong 'area-based' focus, particularly since the 1980s (Chatterton and Bradley, 2000). The thinking behind area-

based urban regeneration initiatives is that a range of services needs to be delivered in order to tackle a range of inter-related issues faced by residents (Social Exclusion Unit, 1998; Scottish Executive, 1999). However, implicit in this approach to regeneration is an assumption that 'area' effects constitute part of the problems faced by residents in disadvantaged communities. 'Spatial interaction' effects, particularly the proximity of jobs, are given less consideration. Indeed, urban regeneration initiatives in Britain have been criticised for being too localised geographical (for example, see Hall, 1997b).

Increasingly, area based initiatives are focusing on improving residents' employment prospects, in addition to tackling issues of poor housing and lacking amenities. The results of this research showed that some residents of disadvantaged urban neighbourhoods can be quite localised geographical in their approach to job search. Therefore, one aim of urban regeneration initiatives which could be given greater emphasis is to introduce measures to increase the spatial extent of both job search by residents, and the spatial extent of recruitment by surrounding employers.

A good way to provide spatially ubiquitous job vacancy information is through the press. However, it is difficult to see how to encourage employers to make more use of the press for lower-skilled jobs. Local free advertising newspapers are sometimes a good source of job vacancy information, although these do not always get delivered in some deprived neighbourhoods due to fear of crime (Social Exclusion Unit, 1998). The Employment Service, if a partner in area regeneration initiatives, could produce a weekly publication of job vacancies in and around the local area for sale to newsagents or for free distribution, perhaps in supermarkets, if advertising could cover costs.

The internet is another source of 'weightless' information, but access to the internet in deprived neighbourhoods is low. However, the increasing number of employment agencies with databases of job vacancies on-line suggests that help should be given to job seekers in making use of this information resource. This not only applies to area based regeneration initiatives, but to policies to help the unemployed generally.

9.5.3 *Urban policy*

One solution to the spatial barriers to employment faced by people and the effects of employment deconcentration within metropolitan areas, is to promote suitable (blue-collar and lower-skilled) employment close to disadvantaged areas, and in the cores of metropolitan areas generally (Kasarda, 1990; Porter, 1997). The data on new recruitment gathered in this study and the employment share distance decay curves of Webster (1994) show that local residents will be more likely to secure these jobs than people who live further away. However, there are three key arguments against this approach which need to be answered.

First, altering the location of firms could be economically sub-optimal. However, the findings of this research show that land and property availability is the key factor in firms' decisions to relocate within the Glasgow conurbation. Thus, public sector subsidised brown-field site preparation and efficient land and property brokering and marketing may be able to alter some firms' locational decisions within the Glasgow conurbation at relatively modest cost to the public purse, and without damaging economic efficiency.

Second, because such jobs have been in decline for some time in the cores of metropolitan areas and nationally as a whole, this solution may not be able to produce sufficient jobs in the cores of metropolitan areas in the long-term to tackle the socio-economic disadvantage found there. However, there may be short term social benefits in allowing manual workers more time to adjust their skills, attitudes and aspirations in line with the types of employment in new growth industries, as manual and lower-skilled workers are less likely to retrain after redundancy than other workers. Of those who lost a job in the ten years prior to 1997, only 15.6% of skilled manual, semi-skilled and unskilled workers undertook retraining with a year, compared to 27.8% of professional, managerial/technical and skilled non-manual workers³¹.

³¹ Source: National Adult Learning Survey, 1997

Third, there are likely to be displacement effects in that jobs created in a city are likely to be at the expense of another location. However, this has to be set against the benefits in terms of greater spatial equity and equality.

An alternative to altering the spatial distribution of jobs in order to reduce 'spatial mismatch', is to alter the spatial distribution of the workforce. However, given the limits to people's desire to make employment related moves within the Glasgow conurbation as demonstrated by the results of this thesis, it is unlikely that promoting residential mobility at this spatial scale will be effective. In addition, large scale forced housing relocations within metropolitan areas, as the British experience of the 1950s and 1960s showed, have detrimental social consequences (Malpass and Murie, 1994).

However, in cases where an individual's long-term job relocates producing an unsustainable commute, there may be barriers which policy can address. Individuals in this situation in social rented accommodation may not wish to move house because they are unable to transfer to accommodation of equally good value for money within the social or private rented sectors or by moving into owner occupation. Therefore, it may be beneficial to the operation of labour markets at the metropolitan and national levels to ease the process of transferring tenants within or between social landlords. The promotion of good quality affordable private rented accommodation may also be beneficial in this respect (MacLennan and Pryce, 1996). If residential mobility from and into social housing were easier, then people may become more willing to 'try' a job more distant from their current home within metropolitan areas, anticipating the possibility of changing residence in the future in order to reduce that commute.

The above discussion implies a need to increase gross out-migration from the cores of British metropolitan areas of blue-collar and lower-skilled workers in order to assist labour market adjustment to the job loss of much of the post war era. However, recent emphasis in urban policy since the report of the Urban Task Force Report (1999) and the Urban White Paper (DETR, 2000a), has been on the need to attract people back into large cities. Although the Urban White Paper refers to England only, this goal has featured in urban policy discussion in other parts of the UK. For example, the Scottish

Executive is currently carrying out a 'Cities Review' due to report in 2002 in order to help develop an urban strategy, focussing on the problems associated with population decline.

The Urban White Paper (DETR, 2000), which drew strongly on the report of the Urban Task Force (1999), emphasises mechanisms to attract house-builders and population back into Britain's larger cities in order to deliver an 'urban renaissance'. However, although briefly mentioning economic decline as part of the cause of the decline in cities' population, the Task Force report was criticised for not making policy recommendations as to how to tackle the decline of employment in cities (Champion, 1999; Lizieri, 1999; Roxburgh, 1999; Turok, 1999; Hall, 2001; Turok, 2001).

It may be possible, and is probably desirable, to attract sufficient numbers of people to reside in cities to halt the overall population loss. Those who work in cities and live in suburbia or further out still in 'ex-urbia' may be persuaded to live in cities if the housing choice, residential attractiveness and academic results of state schools were improved (Urban Task Force, 1999). However, the research findings of this thesis suggest that it would be necessary to boost the number of jobs in British metropolitan cores in order to address the socio-economic disadvantage disproportionately found there. Furthermore, people who work in the ring of a metropolitan area but continue to live in the core may be more prone to moving to a suburban residence than someone who lives and works in the core. Thus, policies to reconcentrate jobs in metropolitan cores may help prevent further population decline.

9.5.4 Policies to deal with unemployment

It was noted by the Cabinet Office that the number of job vacancies in Britain in 1999 exceeded the number of (claimant) unemployed people (Cabinet Office, 1999).

Therefore, the Cabinet Office concluded, unemployment was caused by a mismatch between the skills of the unemployed and the skills required by employers. However, this conclusion does not consider mismatches in the location of job vacancies and the residential location of the unemployed, both between regions, and (as the results of this work show), also within metropolitan areas.

Geographical variation in labour market conditions is important in macro economic policy making. For example, wage inflation may arise because of a labour shortage in one part of a country, but if analysed nationally, there may appear to be a labour surplus over the country as a whole. This would have implications for interest rate setting to combat inflation, because a national level analysis would suggest that labour market conditions would pose no threat to wage inflation, whereas in some parts of the country this may not be true.

Policies to deal with unemployment in Britain over the last two decades, and currently the New Deal programme, have focused on explanations of why some individuals are more prone to spells of unemployment than others. Because models of individuals' risk to unemployment have in the past often not considered the local availability of jobs in different locations, the design of such policies has focused on improving the skills and employability of long-term unemployed people (Turok and Webster, 1998; Peck, 1999). Thus, policies such as the New Deal have been designed with individual rather than spatial solutions in mind, and this has resulted in supply side interventions in the labour market to the exclusion of demand side interventions. This illustrates a confusion between explanations of why particular individuals become unemployed and explanations of the overall level of unemployment nationally. The New Deal applies the logic of the former to tackle the latter.

The New Deal seeks to enhance the skills and employability of certain unemployed groups. The results of this research show that in the metropolitan cores there may be inadequate availability of suitable jobs available within reasonable commuting distance of many of the unemployed. This may also be true of other types of area which have experienced a decline in the demand for labour over recent decades, such as former coal-mining areas (Beatty et al, 1997).

This suggests that policies such as the New Deal need to be flexible in order to accommodate different labour market conditions found both between and within regions. In some locations, demand side measures to increase the number of jobs

available locally may be required in addition to supply side measures such as the New Deal.

There is, however, a role for training programmes in helping people access jobs in growth sectors of the economy. No doubt that in the long-term, this is necessary in meeting the needs of business for long-term growth in metropolitan areas and in the country as a whole, and ensuring that all groups of people benefit from economic growth in the newly expanding sectors of the economy. However, skills and cultures cannot be changed overnight (Fine, 1998).

The New Deal does not provide high level training designed to meet skills shortages in the labour market (Peck, 1999). Rather, it, and other 'workfarist' policies, assume that the longer term unemployed are *unemployable* due to lacking personal skills and therefore are aimed solely at the bottom end of the labour market (Turok and Webster, 1998). However, the effectiveness of such training in making a significant impact on the workforce in terms of the quantity and quality of the supply of labour is questionable (Grover and Stewart, 2000). As argued above, the New Deal attempts to reduce the overall level of unemployment in the economy but its design was based on theories which seek to explain the risk of particular individuals to unemployment rather than on theories which seek to explain the overall level of unemployment.

Schemes such as the New Deal will not transform the nature of the unemployed. Rather, good quality mainstream education and training opportunities need to be accessible to people from a wide range of backgrounds and ages within mainstream provision. Gordon (1999) argues that this will allow existing workers to move into better jobs thus creating job vacancies for the unemployed.

9.5.5 Transport policy

Transport mobility is important in opening up potential jobs to job seekers. By increasing commute distance by 10%, the area of the catchment of jobs reachable increases by 21%. The labour market benefits of increasing the distance people commute are therefore potentially significant to the individuals concerned.

The results of this work show that access to a car is vital in enabling people to access decentralised employment, often located on industrial estates which are poorly served by public transport. This finding questions the distributional equity of current transport policies which seek to increase the cost of motoring in order to take account of environmental externalities, often through the use of regressive taxes such as fuel duty.

In addition to reducing fuel taxation, promoting low income car access may be beneficial, although also has detrimental environmental consequences. Furthermore, higher car ownership may have a detrimental effect on the financial viability of marginal bus services. However, the viability of serving some out-of-town developments, including suburban industrial estates, by public transport is questionable. Therefore, promoting low income car ownership may be the appropriate balance between social and environmental objectives. Social equity is not promoted by denying public transport users jobs and amenities in locations which are significantly easier to access by private transport.

The means of increasing ownership of, or access to, private transport are not obvious, although reducing fuel duty may encourage some people to purchase cars. Vehicle Excise Duty could be further reduced for small-engined vehicles although the cost saving would be small in relation to the overall cost of putting a car on the road. Car insurance costs are often prohibitive for young people buying a first car, particularly in disadvantaged urban areas (HM Treasury, 1999). It may be possible for regulation of the private insurance market to require a greater degree of cross subsidisation between risk groups. In addition, insurance tax for certain 'needy' groups could be reduced or eliminated. Alternatively, a state subsidised policy could reduce costs for young people and residents of disadvantaged areas which attract high premiums in the private insurance market. Finally, the recent inquiry into the higher cost of car purchase in Britain compared to the rest of Europe, and the political pressure behind this issue, may exert further downward pressure on the cost of motor vehicles in Britain.

The Employment Service could provide driving lessons for the long-term unemployed, possibly part funded by Local Enterprise Companies in Scotland or Regional Development Agencies in England. This may also have the benefit of increasing self-esteem among the long-term unemployed. The Employment Service could also fund a car lease pool for people to travel to work. People could be eligible to use this service for a certain period after coming off Job Seekers' Allowance. Indeed, the Wheels to Work scheme whereby job seekers can hire motor scooters in some parts of the country to attend interviews is an example of the type of approach which may be beneficial to those with difficulty gaining access to suitable employers by public transport.

Greater access to private transport could be promoted through employers' lift-sharing schemes. This would also be of environmental benefit. Public advice and subsidy could be given to employers to organise lift booking schemes. Groups of firms on industrial estates could perhaps organise this collectively. This may be of benefit to employers in locations poorly served by public transport in terms of staff recruitment, retention and morale.

An alternative means to increase mobility is to improve public transport. This is largely contingent upon two principal factors. First, the pattern and density of land use, and second, the level of public subsidy. Changes in Planning Policy Guidance (PPG) over recent years are moving planning policy in the appropriate direction with regards to the former, certainly with regard to retail and residential developments. Notably, PPG 13 restricts future granting of planning permission for out of town retail facilities except in situations of a clear demonstrable need and then only when public transport can be provided (DETR, 2001). Also, PPG 3 suggests a 'sequential approach' to the location of new housing. Brown-field sites should be sought first. If none is economically viable, then green-field sites may be considered, but the most public transport accessible sites should be given priority (DETR, 2000c). However, greater emphasis to the public transport accessibility of new commercial and industrial developments could be introduced to national planning policy.

The level of public subsidy could be increased to improve public transport provision within the existing land use pattern. This could be justified within existing cost-benefit appraisal frameworks used to assess transport proposals by broadening the evaluation criteria to include social and environmental factors. Some moves have been made to do this for trunk road appraisal by the Labour government elected in 1997 by identifying five new appraisal criteria: environment, safety, economy, accessibility and integration (DETR, 1998b). This new approach should perhaps also be applied more robustly to local public transport investments, although there are moves in Scotland to move towards a common appraisal framework applying these five criteria to proposed investments including public transport schemes as well as new road building (Scottish Executive, 2001).

More bus services could be socially tendered by local authorities, if sufficiently resourced, to serve industrial estates, particularly from areas of high unemployment. More imaginative mechanisms could also perhaps be put in place. For example, tax breaks could be offered to firms who operate 'works buses' or organise lift-sharing schemes. In addition, public transport fare concessions could be offered to people returning to work after a period of unemployment.

The US has adopted some of these measures. For example, the Access to Jobs program has pledged \$750 million to promoting low income access to transportation, both through car ownership and improved public transport (Pugh, 1998).

9.5.6 Issues for Glasgow City Council

As sponsors of this research, Glasgow City Council have an interest in any policy issues which arise from the research findings. The main policy implications for Glasgow City Council are outlined in this section.

Area based urban regeneration initiatives within the City of Glasgow should become more 'outward looking' in their approach. While building community cohesion, social capital and local amenities is important, it is dangerous to attempt to make communities self-reliant, as this limits access to the benefits available from a high level of interaction

with the rest of the conurbation. Economically participative and socially integrated residents of 'successful' urban neighbourhoods have high levels of interaction with the broader conurbation, indeed with the rest of Scotland, Britain and Europe. It is therefore unrealistic and constraining to limit residents of 'disadvantaged' neighbourhoods to more localised interactions and amenities.

Much demolition of surplus and sub-standard council housing continues in the City, as well as in parts of North Lanarkshire. Many Housing Associations are building new improved housing for rent through Housing Association Grant administered through Scottish Homes, usually adjacent to, or on the previous site of, old housing which has been demolished. These are often the parts of the City with the highest rates of unemployment and the worst social problems, for example Arden near Pollok in the south-west and the Cranhill-Blackhill area in the east of the City, both areas with major demolition and new build programmes (Glasgow City Council, 1996). Without a reversal, or at least arrest, of the decline in manual and lower-skilled jobs in the City, the long-term viability of these new housing developments is questionable. The social and physical problems in such neighbourhoods are likely to become re-established in the absence of improved physical access to employment.

Over eight per cent of land in Glasgow was vacant in 2000, significantly greater than elsewhere in Scotland, with Dundee City having the next highest proportion at 5.1%, followed by North Lanarkshire (also part of the Glasgow conurbation) at 4.4%³². Some of the vacant land which is indicated in the Glasgow and the Clyde Valley Joint Structure Plan (1995) as suitable for industrial use, is not being developed. This, reinforced by the reasons for relocation given by the firms in this study, suggest a need for increased public intervention in site preparation and marketing. The City of Glasgow is already active in this respect with its Strategic Industrial Sites initiative, but additional resources for land surveying, decontamination, site preparation and compulsory purchase are required from the Scottish Executive (Glasgow City Council, 1997aa).

³² Source: Scottish Executive Vacant and Derelict Land Survey, 2000

The dominant issues to emerge in the examination of firm relocations in this study were the need for space for future expansion, flexible premises design and speedy property brokerage. Therefore, in addressing these issues, Glasgow may be in a position to retain a greater proportion of firms that are expanding the number of people they employ, which currently leave the City because they cannot find suitable development sites or property for expansion quickly and easily enough. In addition, Glasgow may be able to capture a greater proportion of relocating firms originating outwith the City.

These are issues which the City of Glasgow may wish to re-examine in terms of institutional structures and funding sources for firm retention, firm attraction, pre-construction of flexible industrial floor-space, the assembly of large vacant sites through compulsory purchase, the simplification of planning regulations and marketing and brokerage functions. The designation of parts of Glasgow as an Enterprise Zone with the attendant tax benefits to new firms locating there would be of benefit in this respect.

The New Deal, as argued previously, is less appropriate in a slack local labour market, such as that found in Glasgow, than in some other parts of the country. The City would be well employed carrying out a skills audit to identify which skills are in short supply across the local labour market by carrying out a survey of employers. The results of this could then be communicated to the Employment Service and local colleges.

Mainstream training could then be 'bent' to better address the needs of business. This may then reduce labour in-migration to the City and region (and reduce labour out-migration) by allowing a larger proportion of job vacancies to go to existing residents. Indeed, one of the firms interviewed in the course of this research commented on the non-responsiveness of local colleges to the training needs of business, in comparison to the Forth Valley area in which he had worked previously.

Finally, the Glasgow and the Clyde Valley Joint Structure Plan Committee, could assess the public transport accessibility of the key employment nodes in the ring of the conurbation, particularly from areas of high unemployment. This might form the basis against which to design new socially tendered bus services, if funding was available for this.

9.6 Summary and conclusions

The results of this work show that approximately 6-12% of the workforce in the Glasgow conurbation face constraints on how far they can commute within the conurbation. Since 17%³³ of the workforce of working age in Glasgow in 1996 (the point around which many of the firm relocations in this study took place) was ILO unemployed, a large proportion of Glasgow's unemployed could potentially face spatial barriers to gaining employment. This result is similar to that of a previous firm relocation study in Detroit, and has a degree of consistency with the findings of other research into the spatial mismatch hypothesis using different methodologies.

An important point to note is that public transport dependency presents a greater spatial barrier to employment than simple geometric separation from employment opportunities. This may be a particular issue in Glasgow since in 1991 only 34% of households have a car, compared to 58% in the conurbation ring and 57% in Scotland as a whole, and 49% of households in the other metropolitan cores in Britain.

This work has shown that people do not move house within the Glasgow conurbation in response to commuting constraints. This is in contrast to the firm relocation study in Detroit which found that, for black people, residential mobility rates rose as a result of the relocation. However, this and other minor differences are likely to be due to black people in Detroit moving to the suburbs for environmental reasons and also due to a small number of movers in the Glasgow sample. Both the Detroit and Glasgow studies found that public transport dependency contributes towards reduced residential mobility. The results of this study did, however, show that a small minority of people when they are moving house within the Glasgow conurbation in any case, are more likely to take the opportunity to shorten their commute.

The results of this work also show that job search and/or recruitment behaviour do not open up all the jobs within potential commuting range to individuals. Territorial localism restricts the job search activities of some residents of certain neighbourhoods.

³³ Source: Labour Force Survey

The role of recruitment practices in producing this outcome was less clear from the results, however. This is not a new finding *per se* but has not been applied by previous work specifically to the spatial mismatch hypothesis.

Overall, commuting and job search/ recruitment processes appear to be the most significant spatial barriers to employment within the Glasgow conurbation. Of these, job search and/or recruitment processes are slightly more significant, but it should be borne in mind that the anticipated ease of commuting to different locations influences where people search for work. Residential mobility does present a substantial spatial barrier to employment, but to describe it as such is perhaps a slight misrepresentation. Many people, certainly those who do not live in social rented accommodation, may be able to move house to be closer to work if they so desired, but they have no desire to do so owing to ties to their neighbourhood and/or property, even when faced with a difficult commute which may result in unemployment or economic inactivity.

This research has also shown that each of these three spatial barriers to employment within the Glasgow conurbation is concentrated on the lower-skilled, lower-paid and those dependent on public transport, and particularly women in these categories. Consequently, skills and spatial mismatches reinforce each other, and this interaction has not hitherto been accounted for in the specification of multi-variate models which seek to estimate the relative importance of skills versus spatial mismatches in explaining the spatial distribution of unemployment within a metropolitan area.

In explaining geographically concentrated unemployment, this chapter has argued that firmer differentiation is required between explanations regarding: 1) the spatial concentration of people with similar characteristics; 2) 'area' effects which affect people's behaviour or exposure to information; and 3) 'spatial interaction' effects regarding the physical relationship between a particular neighbourhood and the rest of the metropolitan area in which it is located.

This chapter then went on to consider the implications of the research finding of this work for explanations of unemployment more generally. It was argued that greater

differentiation needs to be made between theories which seek to explain: 1) the spatial distribution of unemployment; 2) the risk of particular individuals to unemployment; and 3) the overall level of unemployment. It was then argued that a more specific treatment of space is required in each of these three types of model of unemployment.

This work used an innovative methodology in order to address a number of problems associated with the methods used previously to test the spatial mismatch hypothesis. A key weakness, however, of the firm relocation methodology is the difficulty in generalising from the findings and, in particular, not being able to generalise about the relative importance of skills and spatial mismatches in explaining the spatial distribution of unemployment within a metropolitan area. A key weakness with the firm relocation methodology as operationalised in the course of this research was its inability to generate large sample sizes, particularly of leavers and movers. Consequently, future research making use of the firm relocation methodology would be advised to carry out a 'before' and 'after' study if possible rather than relying on a retrospective analysis.

Overall, a wide range of research methods should be brought to bear on the spatial mismatch hypothesis in Britain. The methodological complexity involved in designing a robust test of the spatial mismatch hypothesis is such that it would be unwise to rely solely on one methodology and/or type of data, whether longitudinal or cross-sectional, or quantitative or qualitative.

In general, it can be stated *a priori* that the following could be expected to influence the nature and extent of spatial barriers to employment within different metropolitan areas. Each could be assessed by future research across different metropolitan areas in Britain:

- 1) the extent of employment deconcentration in comparison to population deconcentration;
- 2) the extent of spatial segregation of different socio-economic groups, and of those in social rented housing;
- 3) the car ownership rates found in different parts of a given metropolitan area;
- 4) the geographical size of a given metropolitan area; and

5) the slackness of the overall metropolitan labour market.

The findings of this work regarding the nature of the three different types of spatial barrier to employment more specifically point towards the following three areas for future research:

- 1) means to increase transport mobility and assess its benefits;
- 2) the residential locational decisions of people who work in 'decentralised' jobs; and
- 3) the role of car ownership and personal mobility in determining people's cognitive spaces, particularly with regard to job search areas.

The findings of this research have important implications for policy. Regeneration initiatives and urban policy more generally need to consider the geographical availability of suitable jobs to different urban neighbourhoods. Similarly, policies such as the New Deal to tackle unemployment need to be more flexible in order to accommodate variation in labour market conditions, both between and within regions, including metropolitan areas. Means to increase the availability of jobs in the cores of metropolitan areas might include: land and property remediation/demolition; land ownership consolidation; the marketing of industrial development sites; and fiscal and other incentives such as those offered to firms moving into Enterprise Zones.

Increasing the spatial extent of commuting and of job search would also help reduce disparities in unemployment rates found within metropolitan areas. Measures to help achieve this might include: encouraging employers to advertise job vacancies in the press; encouraging job seekers to make more use of the internet in their job search activities; promoting low income car ownership; promoting lift-share schemes; and more social tendered bus routes to industrial estates.

A particular policy issue for Glasgow City Council raised by the findings of this research is the long-term future for certain neighbourhoods in areas where the loss of employment has been the most severe. Currently, redevelopment of some of these areas is going ahead with programmes of demolition and new building of social housing.

However, while the decline in accessible suitable employment continues, the long-term future of these new developments is questionable. In addition, as far as it is within the remit of the City Council, it would be advisable to attempt to 'bend' the New Deal and mainstream training provision to meet skills shortages as much as possible. This would minimise dead-weight and substitution effects which are likely to result from the operation of a supply side unemployment policy such as the New Deal in a demand deficient local labour market such as Glasgow. Finally, Glasgow City Council, in collaboration with surrounding local authorities, may wish to consider tendering more bus routes to industrial estates.

10. CONCLUSION

Unemployment rates and other indicators of socio-economic disadvantage are consistently higher in the cores of metropolitan areas in Britain, the US and elsewhere. The conventional explanation of this is that there is a mismatch between the skills of the residents of metropolitan cores and the skills required by employers in the modern economy, particularly those located in city centres. However, this study has shown that a spatial mismatch between the residential location of the unemployed and the location of suitable jobs within the Glasgow conurbation could explain part of the spatial variation in unemployment rates in the Glasgow conurbation for lower-skilled and lower-paid groups, those dependent on public transport, and particularly women in these categories.

The skills mismatch perspective does not provide a coherent explanation of why those with unfavourable characteristics in the labour market should be disproportionately located in the core of a metropolitan area rather than in any other part. In addition, it is methodologically difficult to assign direct causation to the association between low skill and unemployment, particularly in the face of the fact that the demand for lower-skilled employment has been falling. A fuller explanation comes in the form of the spatial mismatch hypothesis which states that, in addition to issues connected to skills and race, part of the reason for higher than average unemployment rates found in the cores of US metropolitan areas is that employment has deconcentrated within metropolitan areas over recent decades. The research for this thesis has applied the spatial mismatch hypothesis in a broad sense (i.e. not tackling the question of race) to the Glasgow conurbation in Britain.

However, the spatial mismatch hypothesis itself is not without weaknesses. The theoretical discussion in chapter three concluded by outlining a conceptual framework which integrates urban economics and labour economics in helping explain the processes involved in creating spatial inequalities in unemployment rates within metropolitan areas. More specifically, this framework introduces change through time, and considers adjustment mechanisms to changes in the proximity of jobs such as wage

adjustment, changes in economic activity rates, migration, commuting and housing costs, within segmented local labour and housing markets.

Previous work into the spatial mismatch hypothesis has tended to focus on assessing the *overall* significance of space as a barrier to employment within metropolitan areas. Very few studies have considered the precise nature of space as a barrier to employment, in particular the relative importance of commuting, residential mobility and job search/recruitment processes. Therefore, this thesis investigated the nature and extent of these three types of spatial barrier to employment within the Glasgow conurbation.

A number of methodological concerns with previous research into the spatial mismatch hypothesis have been identified by other authors and by the critique made in chapter four of this thesis. In particular, the use of cross-sectional data fails to capture processes operating through time which are vital to the interpretation of cross-sectional associations between labour market indicators and the local availability of jobs. For example, when using cross-sectional data, reference must be made to the extent of recent deconcentration of employment and population. Additionally, reference must be made to the *reasons* for the deconcentration of employment and population. Methodological weaknesses identified with previous work also include not taking account of the mode of travel of workers from different parts of metropolitan areas, crude measures of accessibility to employment, and the assumption that unemployment is the main outcome of low accessibility to jobs to the exclusion of low pay or economic inactivity.

This thesis therefore develops a methodology which has not been frequently used and addresses some of the methodological concerns associated with much previous work. To test the hypothesis, this thesis looked at firms which have relocated within the Glasgow conurbation. Specifically, the numbers of employees who leave their job or move house because their employer relocates were examined in order to assess to what extent commuting and residential mobility are barriers to employment within the Glasgow conurbation.

The results show that those without access to a car and those in the lowest paid and lowest skilled jobs are least able to commute to the new sites, particularly women in these categories. Those in the highest paid and most secure jobs are the most likely to move house closer to work, although few, if any, people do this primarily with the purpose of shortening their commute in mind. People recruited at the new sites tend to live closer to the firms than the remaining original workforce, which suggests that across space, job search and recruitment processes are greater barriers to employment than commuting.

The findings of this work show that each of the three types of spatial barrier to employment within the Glasgow conurbation is concentrated on lower-skilled groups, lower-paid groups and those dependent on public transport, and particularly women in these categories. Thus, skills and spatial mismatches reinforce one another. Furthermore, this interaction between spatial mismatch and skill level has not hitherto been accounted for by previous research in the specification of models to explain the relative contribution of skills and spatial mismatches to the spatial distribution of unemployment rates within metropolitan areas.

To recapitulate, this thesis has made five original contributions. First, it has provided a critique of the skills and spatial mismatch perspectives, raising points not made previously in the existing literature. Second, it has brought empirical evidence to bear on the contested spatial mismatch hypothesis. Third, it has applied to Britain the spatial mismatch hypothesis which has been developed largely in the US. Fourth, it has investigated the relative importance of three different types of spatial barrier to employment within metropolitan areas which previously had remained largely unexplored. Finally, it has developed an infrequently used methodology which provides richer information on the processes at work within metropolitan labour markets and on the nature of spatial barriers to employment than has hitherto been possible under currently dominant methodologies.

While this work has provided new evidence in relation to the spatial mismatch hypothesis in the Glasgow conurbation, many issues remain uninvestigated. In particular, how the following factors affect the nature and extent of spatial barriers to employment within different metropolitan areas could usefully be researched:

- 1) the extent of employment deconcentration in comparison to population deconcentration;
- 2) the extent of spatial segregation of different socio-economic groups, and of those in social rented housing;
- 3) the car ownership rates found in different parts of a given metropolitan area;
- 4) the geographical size of a given metropolitan area; and
- 5) the slackness of the overall metropolitan labour market.

The findings of this work regarding the nature of the three different types of spatial barrier to employment more specifically point towards the following three gaps in existing knowledge:

- 1) means to increase transport mobility and assess its benefits;
- 2) the residential locational decisions of people who work in 'decentralised' jobs; and
- 3) the role of car ownership and personal mobility in determining people's cognitive spaces, particularly with regard to job search areas.

The findings of this work raise important issues for policies with a bearing on the spatial distribution of unemployment within metropolitan areas. Urban regeneration initiatives need to take more account of the spatial interaction between neighbourhoods and the rest of the metropolitan area in which they are located. In particular, this applies to the physical relationship of the neighbourhood in question with the location of employment opportunities surrounding it and the transport infrastructure that connects them. Urban policy needs to consider mechanisms which may be able to increase, or at least arrest the decline in, the number of manual and lower-skilled employment opportunities in the cores of Britain's metropolitan areas. The Urban White Paper of 2000 which seeks to attract population back into Britain's large cities is unlikely to deliver the 'urban

renaissance' it aims to achieve, in the absence of measures to halt the deconcentration of employment opportunities, particularly in the manual and lower-skilled categories.

The New Deal is an employment initiative designed to improve the skills and enhance the employability of certain groups of long-term unemployed people. The results of this research show that in the metropolitan cores there may be inadequate availability of suitable jobs available within reasonable commuting distance of many of the unemployed found there. This may also be true of other types of area which have experienced a decline in the demand for labour over recent decades such as former coal-mining areas. This suggests that policies such as the New Deal need to be flexible in order to accommodate different labour market conditions found both between and within regions. In some locations, demand side measures to increase the number of jobs available locally may be required in addition to supply side measures such as the New Deal. The distributional impact of transport policies which have the effect of limiting car ownership and use among lower income groups also needs to be reassessed. In addition, the public transport accessibility of all types of new development needs to be given greater emphasis in national planning policy.

The metropolitan areas of Britain are at an important juncture in their history. Despite decades of decline in employment and population, the rate of decline in population slowed throughout the 1980s (Champion, 1994). Indeed, population estimates for London in the late 1990s show some signs of modest population growth, although this has been aided by international immigration. Modest population gains in some metropolitan cores and cities lag behind the gains in the metropolitan rings and in smaller cities and towns further down the 'urban hierarchy' in Britain, hence population deconcentration in relative terms continues. Employment, however, continues to decline in metropolitan cores, although there were some signs during the late 1990s that the rate of decline in employment opportunities is slowing in Glasgow (Glasgow City Council, 2000).

The role of metropolitan areas and large cities in the 'new' economy is clearly changing rapidly. It is vital for the social cohesion of Britain's metropolitan areas that redundant

industrial workers participate in, and contribute to, the changing economic, social and cultural functions of cities.

Britain is currently in a period of low unemployment. Many commentators and policy makers talk of full employment, certainly in the south of the country. However, many inner city areas continue to lag behind other parts of Britain, particularly in terms of economic activity rates. A key challenge faced by policy makers is to ensure that residents of inner city neighbourhoods, and of metropolitan cores generally, enjoy the full benefits of national economic prosperity.

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APPENDIX ONE – FIRM BIOGRAPHIES

Firm 1

Nature of business: prints computer keyboards and distributes into an international JIT supply chain; rapidly expanding.

Employment at time of relocation: 36 in total. Electrical engineers, logistics managers, administrators, machine operatives, warehouse staff and drivers.

Relocation: Port Glasgow to Inchinnan Industrial Estate. 67 generalised minutes by car, 134 generalised minutes by public transport.

Reason for relocation: expansion; needed more warehousing space.

Attraction to new site: proximity to major customers in Irvine and Greenock; proximity to suitable low skilled workforce (they were worried about losing staff); nearly finished premises (owned by Renfrewshire Enterprise) gave speed but flexibility in the final design; business advice, financial and training aid from Renfrewshire Enterprise.

Process of search for new site: numerous sites considered; east side of conurbation rejected for access to customers; Inverclyde favoured but sites had problems with contaminated land

Management of the relocation: ran into industrial relations problems; laid on a bus from Port Glasgow but was expensive so started charging 50p per trip. Numbers on the bus then dwindled as people left, bought cars and arranged lifts, so the bus was withdrawn after ten months. Keen to recruit locals so they do not have problems with time keeping, can do short notice overtime and are less likely to leave.

Reported loss of staff: reported “a few”, but could not be sure of people’s reasons as the firm has high staff turnover.

Firm 2

Nature of business: designs and manufactures air generators (zero air, hydrogen and nitrogen) to remove the need for large cylinders. This firm invented these so still hold the patent - as close as you get to producing money from thin air!

Employment at time of relocation: 20 in total. Chemical and production engineers, assembly workers, sales and administration. Transport is contracted out as and when needed – this is a very low bulk, high value added product.

Relocation: Paisley to Inchinnan Industrial Estate. 22 generalised minutes by car and 105 by public transport (short as the crow flies but there are no bus services directly between the two sites, accounting for the large public transport cost in relation to car).

Reason for relocation: expansion.

Attraction to new site: Inchinnan Industrial Estate suited the firms image – high tech with pleasant environ – good for potential customers visiting the site.

Process of search for new site: looked at several sites across the conurbation. Cost was not important as the firm has a lot of financial backing from its parent company and lenders to market this product.

Management of the relocation: no problems. Only a handful of staff did not travel to work by car, and they arranged lifts.

Reported loss of staff: none.

Firm 3

Nature of business: import, manufacture and distribution of plywood firedoors.

Employment at time of relocation: 14 in total. Executive directors, accounts, sales, warehousemen, machine operators.

Relocation: Yorkhill Quay to Tannochside Business Park. 54 generalised minutes by car, 80 by public transport.

Reason for relocation: expansion, also wanted office and warehouse premises on same site (were in different buildings at Yorkhill Quay).

Attraction to new site: Enterprise Zone incentives, able to design own premises, adjacent land for future expansion, motorway access.

Process of search for new site: looked at all the Lanarkshire EZ sites, but thought Tannochside had the best image and amenities.

Management of the relocation: did worry about losing staff but no incentives were offered.

Reported loss of staff: reported losing three – one from Alexandria who got local employment, one who started his own business, and one who was approaching retirement.

Firm 4

Nature of business: soft drink manufacture and distribution, frozen food distribution

Employment at time of relocation: 180 in total. Machine operatives, production engineers, warehousing, drivers, sales, admin, executive functions.

Relocation: Merged two sites at Blantyre and Bridgeton at Cambuslang Investment Park. 25 generalised minutes by car and 102 by public transport from Blantyre and 19 and 66 respectively from Bridgeton.

Reason for relocation: expansion, Bridgeton site had grown organically so was very disjointed, warehousing was too low.

Attraction to new site: space for warehousing and car parking, motorway access, esp. M74 to open up NW English market. Good image for customers. Glasgow Development Agency paid for site preparation and helped with training costs.

Process of search for new site: several sites across Glasgow were looked at but ground preparation, HGV access and size of sites were generally inadequate.

Management of the relocation: did worry about losing staff. Considered putting on a bus but decided against it.

Reported loss of staff: reported "a few". Released contacts for four. NB – in informal conversation with a senior official of the GDA, I was told this firm apparently lost 25% of its workforce, although the GDA were suspicious this was an overestimate in order to obtain more training grant.

Firm 5

Nature of business: soft drink manufacture (distribution only to logistics hubs, drivers based at hubs).

Employment at time of relocation: 50 in total. Machine operatives, production engineers, sales, administration, executive functions. Note that the relocation accompanied major rationalisation and automation. All employees had to reapply for their jobs and take aptitude tests to become 'multi-skilled production technicians'. Employment fell from 200 to 50, but only 50 jobs actually relocated.

Relocation: Merged sites at Falkirk, Wishaw and Springburn at Westfield Industrial Estate, Cumbernauld. Falkirk: 95 generalised minutes by car and 286 by public transport; Wishaw: 73 and 219 respectively; Springburn: 54 and 181 respectively.

Reason for relocation: expansion, old buildings at previous sites were in disrepair, HGVs on narrow streets was a problem.

Attraction to new site: close to distribution 'epi-centre', an existing building was suitable making it very cheap, lots of room for expansion, water supply the same as Falkirk which produced the best soft drinks.

Process of search for new site: very few sites looked at. Got lucky quickly.

Management of the relocation: £2 per day petrol allowance paid.

Reported loss of staff: Complicated by the re-application for jobs and rationalisation. It was assumed no one was lost because of the relocations.

Firm 6

Nature of business: design and manufacture of maritime diesel engines, servicing and parts.

Employment at time of relocation: 38 in total. Executive functions, mechanical engineers, skilled metal machinists, engine fitters, engine assemblers, drivers, admin

Relocation: Dobbies Loan (north city centre) to Tannochside Business Park. 46 generalised minutes by car and 108 by public transport.

Reason for relocation: firm sold by parent, premises sold separately from under them as the firm had contracted so the premises were too big, were in disrepair and had huge heating bills.

Attraction to new site: premises could be built to spec – needed high roof for cranes and reinforced floor, motorway access, EZ benefits, LDA business support services good.

Process of search for new site: looked at sites in Glasgow and Cumbernauld but premises were not of required spec.

Management of the relocation: minibus put on for 9 months from Glasgow City Centre. Withdrawn after most employees had arranged lift shares.

Reported loss of staff: one fitter from Bridge of Weir, one from Partick who was approaching retirement, two newly qualified apprentices. No contacts supplied.

Firm 7

Nature of business: distribution of vending machines and catering equipment.

Employment at time of relocation: 12 in total. Admin, telesales, travelling sales, warehousemen, drivers.

Relocation: Newhouse Industrial Estate to Kelvin Industrial Estate, East Kilbride. 59 generalised minutes by car and 225 by public transport.

Reason for relocation: expansion, Newhouse had poor amenities and vandalism was a problem.

Attraction to new site: room for expansion, good amenities in surrounding area for staff. Accessibility not very important as market is all across Central Belt.

Process of search for new site: looked at nine sites mostly in Newhouse and Cumbernauld but Kelvin offered an opportunity to buy rather than lease.

Management of the relocation: did not worry unduely about losing staff as they feel confident about being able to recruit in East Kilbride.

Reported loss of staff: one female telesales. No contacts supplied.

Firm 8

Nature of business: housebuilder HQ, support for construction sites, marketing, financial and project management.

Employment at time of relocation: 80 in total. Civil engineers, quantity surveyors, building surveyors, technicians, marketing, accounts, sales, lawyers, admin, personnel.

Relocation: Bishopbriggs to Tannochside Business Park. 52 generalised minutes by car and 151 by public transport, although most staff have company cars and a petrol allowance.

Reason for relocation: premises sold from under them as part of an asset swap associated with a merger with another company.

Attraction to new site: EZ benefits, office was ready built and got a good lease contract, wanted to avoid southwest of the Clyde as most staff live on the north of the river and would have to cross the congested Kingston Bridge. Would have to have introduced flexitime if this was the case.

Process of search for new site: several offices across Glasgow were looked at but were more expensive or car parking was a problem.

Management of the relocation: considered putting on a bus but opted to arrange lift shares. This was done semi-formally and those with company cars were obliged to give someone a lift if they were asked. Worried about the long term acceptability of this arrangement.

Reported loss of staff: one reported (contact given). Older female approaching retirement.

Firm 9

Nature of business: manufacture of soot blowers for power stations.

Employment at time of relocation: 80 in total. Skilled machinists and production engineers, sales, procurement and admin.

Relocation: Clydebank to Bridgton. 49 generalised minutes by car and 103 by public transport.

Reason for relocation: was given an offer they could not refuse for their site.

Attraction to new site: existing premises – speed was of an essence after a site in Clydebank fell through at the last minute. Reinforced floor and height for overhead cranes.

Process of search for new site: Was very rushed. Also looked at Renfrew. Speed was the decisive factor.

Management of the relocation: no significant problems anticipated or encountered.

Reported loss of staff: one older female office worker (contact given).

Firm 10

Nature of business: wholesale distribution of carpets and floor coverings.

Employment at time of relocation: 20 in total. Sales, admin, warehousemen and drivers.

Relocation: Clydebank to Tannochside Business Park. 77 generalised minutes by car and 107 by public transport.

Reason for relocation: expansion.

Attraction to new site: motorway access.

Process of search for new site: looked at business parks at Hillington and around Cumbernauld. LDA were “brilliant” – EZ incentives and aid with training.

Management of the relocation: no incentives offered.

Reported loss of staff: two females lost (contacts given).

Firm 11

Nature of business: electronics assembly.

Employment at time of relocation: 55 in total. Assembly line, mostly female, dispatch and drivers, a handful of electronic production engineers.

Relocation: Motherwell to East Shawhead Industrial Estate, Coatbridge. 24 generalised minutes by car and 77 by public transport.

Reason for relocation: lease expired, premises were too small so did not renew it. Looked into in situ expansion but adjacent mineworkings could not be built on.

Attraction to new site: motorway access, proximity to low skilled female labour, close to old site as was worried about staff loss.

Process of search for new site: looked around Motherwell and Newhouse. Ran into legal problems over land ownership at Motherwell.

Management of the relocation: runs a bus from the centre of Motherwell, with four pick up points. Free for four months, now charges to cover 50% of the cost.

Reported loss of staff: four female assembly workers (contacts given).

Firm 12

Nature of business: Bakers, only two main product lines.

Employment at time of relocation: 40 in total. Machine operatives, dispatch and drivers. Sales, admin and executive functions.

Relocation: Paisley to East Shawhead Industrial Estate, Coatbridge. 77 generalised minutes by car and 186 by public transport.

Reason for relocation: expansion; previously had office, warehouse and production (started in a domestic kitchen) in separate (but close) sites in Paisley – needed them under one roof.

Attraction to new site: able to build to spec, with grant aid from LDA; land for future expansion, EZ benefits.

Process of search for new site: E.Shawhead was only place seriously looked at. LDA very helpful.

Management of the relocation: company cars given to senior staff.

Reported loss of staff: “most” of production staff. No contacts given.

Firm 13

Nature of business: bakers.

Employment at time of relocation: 55 in total. Machine operatives, dispatch, drivers, food technologists, sales, admin, executive functions.

Relocation: East Kilbride to Righead Industrial Estate, Bellshill. 53 generalised minutes by car and 135 by public transport.

Reason for relocation: expansion.

Attraction to new site: got premises built to spec and there is adjacent land for future expansion. LDA training package.

Process of search for new site: looked at sites in East Kilbride but did not have scope for future expansion. Righead came on stream the fastest, so went with it.

Management of the relocation: much complaint about the relocation, so each employee got a one-off payment of £100.

Reported loss of staff: none reported.

Firm 14

Nature of business: whisky distillers and distributors.

Employment at time of relocation: 279 in total, but questionnaires were only distributed to 60 office staff.

Relocation: Barrhead to East Kilbride. 37 generalised minutes by car and 127 by public transport.

NB – this firm declined to be interviewed and was not prepared to distribute the questionnaires to the shopfloor staff.

Firm 15

Nature of business: food distributors

Employment at time of relocation: 90 in total. Sales, warehousemen, drivers, admin, executive functions.

Relocation: Balmore Industrial Estate, Glasgow to Tannochside Business Park. 56 generalised minutes by car and 110 by public transport.

NB – this firm declined to be interviewed.

Firm 16

Nature of business: bakers

Employment at time of relocation: 145 in total.

Relocation: Anniesland to Drumchapel. 21 generalised minutes by car and 81 by public transport.

NB – this firm declined to be interviewed.

TRAVEL TO WORK QUESTIONNAIRE

Thank you very much for sparing five minutes of your time to complete this questionnaire. This is really two questionnaires, although you need only fill in one of them. They are as follows:

Questionnaire 1 - For those who worked at Xxxxxxx before it moved to Cambuslang.

Questionnaire 2 - For those who first joined Xxxxxxx at its present location.

If you first joined Xxxxxxx before it moved to Cambuslang, please complete questionnaire 1 which starts on this page. If you first joined Xxxxxxx at its present location, please complete questionnaire 2 which starts on page 12. Page numbers are on the bottom right hand corner of each page. All sheets are printed on both sides.

Questionnaire 1 - please complete this if you first joined Xxxxxxx before it moved to Cambuslang. If you first joined Xxxxxxx at its present location, please complete questionnaire 2 which starts on page 12.

This questionnaire is in four parts. The first part asks you about your journey to work, the second about your job and the third about your home. The final part asks some basic questions about yourself.

Part 1: Your Journey to Work

This part of the questionnaire asks about how you get to and from work, and any changes you made to your travel arrangements as a result of the relocation of your employer.

1. How do you usually travel to work?

(please tick as many boxes as apply, but omit boxes which apply less than once a fortnight.)

- | | |
|--|--------------------------------------|
| Car (driver) <input type="checkbox"/> | Train <input type="checkbox"/> |
| Car (passenger) <input type="checkbox"/> | Underground <input type="checkbox"/> |
| Bus <input type="checkbox"/> | Bicycle <input type="checkbox"/> |
| Walk <input type="checkbox"/> | Motorbike <input type="checkbox"/> |
| Other (please specify)..... | |

2. How did you usually travel to the **old** site?

- | | | | |
|-----------------------------|--------------------------|-------------|--------------------------|
| Car (driver) | <input type="checkbox"/> | Train | <input type="checkbox"/> |
| Car (passenger) | <input type="checkbox"/> | Underground | <input type="checkbox"/> |
| Bus | <input type="checkbox"/> | Bicycle | <input type="checkbox"/> |
| Walk | <input type="checkbox"/> | Motorbike | <input type="checkbox"/> |
| Other (please specify)..... | | | |

3. Which site did you previously work at immediately prior to the move?

- | | | | |
|-------------|--------------------------|----------|--------------------------|
| London Road | <input type="checkbox"/> | Blantyre | <input type="checkbox"/> |
|-------------|--------------------------|----------|--------------------------|

4. Does the new location of your employer mean you **no longer do** any of the following on the way to or from work **which you did previously?** (please tick as many boxes as apply):

- | | |
|--|--------------------------|
| Take children to/from school | <input type="checkbox"/> |
| Do shopping/other errands | <input type="checkbox"/> |
| Give someone else a lift to their work | <input type="checkbox"/> |
| Other (please specify)..... | |
| No changes | <input type="checkbox"/> |

5. Does the new location of your employer mean you **now do** any of the following on the way to or from work which you could **not do previously?** (please tick as many boxes as apply):

- | | |
|--|--------------------------|
| Take children to/from school | <input type="checkbox"/> |
| Do shopping/other errands | <input type="checkbox"/> |
| Give someone else a lift to their work | <input type="checkbox"/> |
| Other (please specify)..... | |
| No changes | <input type="checkbox"/> |

If you have started driving a car for all or part of your journey to work since the firm moved, please go on to the next question. If you have not started driving a car, please go to question 7.

6. Does using a car? (**please tick one box**)

Have no consequences ☐

Mean someone else could do longer use that car
who previously used it regularly ☐

Mean you bought the car especially ☐

Result in anything else (please specify).....
.....
.....

7. There is a proposal to build a railway station beside Cambuslang Investment Park about 3-400 yards from the Xxxxxxx Group. This would be on the line which currently runs from Glasgow Central to Carmyle. The current Standard Day Return fare from Glasgow Central to Carmyle is £2.30, although zone cards etc. could be used; the train takes 10 minutes and runs every half hour. **Do you think you would use the train to get to work if this station was built?**

I already use the train ☐

Yes, I think I would use the train ☐

No, I do not think I would use the train ☐

Part 2: Your Job

This part of the questionnaire asks you about your job and any changes to your employment you considered as a result of the relocation of your employer.

8. What is your current job title?.....

9. At what date did you first start employment with Xxxxxxx?

Month..... Year.....

10. What was your job title at London Rd/Blantyre immediately prior to the move?

.....

11. At what date did your job title change to your current one?
(if your job title has not changed, please go on to question 12)

Month.....

Year.....

12. Have you ever considered leaving Xxxxxxx, for **any** reason? (please tick the appropriate box)

Yes ☐

No ☐

If no, please go to question 14. If yes, please go on to the next question.

13. What are/were the reasons for this?

Please select up to 3 in order of importance, indicating your 1st, 2nd and 3rd choices by writing in 1, 2, and 3 below.

to care for relatives ☐

better conditions elsewhere ☐

better pay elsewhere ☐

difficult journey to work ☐

unsuitable shifts ☐

change of career/job type ☐

job insecurity ☐

thinking about leaving the Glasgow area ☐

other (please specify)..... ☐

Part 3: Your Home

This part of the questionnaire asks you about your home and any changes to where you live that you considered or actually made as a result of the relocation of your employer.

14. Is your current home? **(please tick the appropriate box):**

- | | |
|-----------------------------------|--------------------------|
| Rented from a local authority | <input type="checkbox"/> |
| Rented from a Housing Association | <input type="checkbox"/> |
| Rented from Scottish Homes | <input type="checkbox"/> |
| Rented from a private landlord | <input type="checkbox"/> |
| Owner Occupied | <input type="checkbox"/> |

15. What is your current full postcode? (e.g. G42 8RY).

This shall be used to calculate the distance you travel to work.

Postcode

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16. Do you? **(please tick as many as are appropriate):**

- | | |
|---|--------------------------|
| Live with your wife/husband/partner | <input type="checkbox"/> |
| Live with your parents or guardians | <input type="checkbox"/> |
| Live on your own | <input type="checkbox"/> |
| Live in shared accommodation | <input type="checkbox"/> |
| Have people in your household who are dependent on you (e.g. elderly relatives) | <input type="checkbox"/> |
| Live in the same house as your children who are under 18 | <input type="checkbox"/> |

17. Please enter in the table below information about people in your household **who work** in the table below. Do not include yourself in the table.

	Person 1	Person 2	Person 3	Person 4
Relationship to you				
Job Title				
Are they the main wage earner for the household budget? (please delete as appropriate)	Yes / No	Yes / No	Yes / No	Yes / No
Name and address of where they work. Please provide the postcode if known.				
	<div style="border: 1px solid black; width: 100px; height: 20px; position: relative;"> <div style="position: absolute; left: 50%; transform: translateX(-50%); width: 1px; height: 100%;"></div> </div>	<div style="border: 1px solid black; width: 100px; height: 20px; position: relative;"> <div style="position: absolute; left: 50%; transform: translateX(-50%); width: 1px; height: 100%;"></div> </div>	<div style="border: 1px solid black; width: 100px; height: 20px; position: relative;"> <div style="position: absolute; left: 50%; transform: translateX(-50%); width: 1px; height: 100%;"></div> </div>	<div style="border: 1px solid black; width: 100px; height: 20px; position: relative;"> <div style="position: absolute; left: 50%; transform: translateX(-50%); width: 1px; height: 100%;"></div> </div>

18. Have you considered moving house to be closer to Cambuslang?

Yes ☐

No ☐

19. Have you moved house since early 1995 (i.e. when you found out your job was to move to Cambuslang)

Yes ☐

No ☐

If No, please go to question 26. If yes, please go on to the next question.

20. Was your previous home? **(please tick the appropriate box):**

- Rented from a local authority ☐
- Rented from a Housing Association ☐
- Rented from Scottish Homes ☐
- Rented from a private landlord ☐
- Owner Occupied ☐

21. What was your previous full postcode (e.g. G42 8RY)?
This shall be used to calculate the distance you travelled to work.

Postcode

--	--	--	--	--	--	--

If you cannot remember, please write down your previous address:

House/Flat number

Street

Town

22. Did you in your **previous** home
(please tick as many as are appropriate):

Live with your wife/husband/partner ☐

Live with your parents or guardians ☐

Live on your own ☐

Live in shared accommodation ☐

Have people in your household who
are dependent on you (e.g. elderly relatives) ☐

Live in the same house as your
children who are under 18 ☐

23. Please enter in the table below information about people in your **previous** household **who worked**. If this is the same as before you moved house, just leave this table blank. Do not include yourself in this table.

However, if **any** of these details have changed, then please complete the **whole** table again. Examples may include you moving in with your partner, your son/daughter leaving home, your husband/wife's job changing, etc. You can write "as before" for any particular person whose information has **not** changed.

	Person 1	Person 2	Person 3	Person 4
Relationship to you				
Job Title				
Were they the main wage earner for the household budget? (please delete as appropriate)	Yes / No	Yes / No	Yes / No	Yes / No
Name and address of where they worked. Please provide the postcode if known.				
	<div style="border: 1px solid black; display: flex; justify-content: space-between; padding: 2px;"> </div>	<div style="border: 1px solid black; display: flex; justify-content: space-between; padding: 2px;"> </div>	<div style="border: 1px solid black; display: flex; justify-content: space-between; padding: 2px;"> </div>	<div style="border: 1px solid black; display: flex; justify-content: space-between; padding: 2px;"> </div>

24. What factors influenced your decision to move house?

Please select up to 3 in order of importance, indicating your 1st, 2nd and 3rd choices by writing in 1, 2, and 3 below.

- | | |
|---|--------------------------|
| change household circumstances | <input type="checkbox"/> |
| to shorten your, or someone else's, journey to work | <input type="checkbox"/> |
| to be closer to public transport | <input type="checkbox"/> |
| wanted a different size/type of house | <input type="checkbox"/> |
| to own your own home | <input type="checkbox"/> |
| wanted a better quality house | <input type="checkbox"/> |
| to live in a better area | <input type="checkbox"/> |
| to be closer to shops/services | <input type="checkbox"/> |
| to be closer relatives/friends | <input type="checkbox"/> |
| to be closer to good schools | <input type="checkbox"/> |
| wanted a garden | <input type="checkbox"/> |
| other (please specify)..... | <input type="checkbox"/> |
| | |

25. Would you have moved house even if your job location had stayed the same? (please tick the appropriate box)

Yes ☐

No ☐

Part 4: Yourself

26. Are you: Male ☐ Female ☐

27. What is your age? (please tick the appropriate box)

under 20	<input type="checkbox"/>	40 - 44	<input type="checkbox"/>
20 - 24	<input type="checkbox"/>	45 - 49	<input type="checkbox"/>
25 - 29	<input type="checkbox"/>	50 - 54	<input type="checkbox"/>
30 - 34	<input type="checkbox"/>	55 - 59	<input type="checkbox"/>
35 - 39	<input type="checkbox"/>	over 59	<input type="checkbox"/>

28. What is your total **annual** income from your job at XXXXXXX before tax? (please tick the appropriate box):

less than £5 000	<input type="checkbox"/>	£12 500 - £14 999	<input type="checkbox"/>
£5 000 - £7 499	<input type="checkbox"/>	£15 000 - £19 999	<input type="checkbox"/>
£7 500 - £9 999	<input type="checkbox"/>	£20 000 - £24 999	<input type="checkbox"/>
£10 000 - £12 499	<input type="checkbox"/>	greater than £25 000	<input type="checkbox"/>

29. What is your total **annual** combined **household** income, including state benefits, interest on savings, returns from investments etc, before tax? (please tick the appropriate box)

less than £5 000	<input type="checkbox"/>	£25 000 - £29 999	<input type="checkbox"/>
£5 000 - £7 499	<input type="checkbox"/>	£30 000 - £34 999	<input type="checkbox"/>
£7 500 - £9 999	<input type="checkbox"/>	£35 000 - £39 999	<input type="checkbox"/>
£10 000 - £12 499	<input type="checkbox"/>	£40 000 - £44 999	<input type="checkbox"/>
£12 500 - £14 999	<input type="checkbox"/>	£45 000 - £49 999	<input type="checkbox"/>
£15 000 - £19 999	<input type="checkbox"/>	£50 000 - £54 999	<input type="checkbox"/>
£20 000 - £24 999	<input type="checkbox"/>	greater than £55 000	<input type="checkbox"/>

If you changed your travel to work arrangements as a result of Xxxxxxx's move to Cambuslang, or considered changing job and/or considered or actually did move house, I would be very interested to have a brief chat with you about the options you considered in more detail. You shall not be asked anything that is not of direct relevance to the questions in this questionnaire. This shall be very informal and take about 10-15 minutes of your work time - the Xxxxxxx Group have agreed to this. I would stress that this would be treated in the strictest of confidence, and you would not be named nor identifiable in any other way to anyone, including your employer.

If you are happy to have a short chat with me about some of your answers to this questionnaire, please write down your details below, so you can be contacted at work:

Name.....

Dept/Section.....

Please put this in the freepost envelope provided and either:

- a) Put it in the post**
- b) Place it in one of the collection boxes at the Xxxxxxx Group. These are located at Dispatch, the Factory Office and the Wages Office.**

THANK YOU VERY MUCH FOR YOUR TIME

Questionnaire 2 - please complete this if you first joined Xxxxxxx at its present location.

This questionnaire is in four parts. The first part asks you about your journey to work, the second about your job and the third about your home. The final part asks some basic questions about yourself.

Part 1: Your Journey to Work

This part of the questionnaire asks about how you get to and from work, and any changes you made to your travel arrangements as a result of taking your job with Xxxxxxx.

1. How do you usually travel to work?

(please tick as many boxes as apply, but omit boxes which apply less than once a fortnight.)

- | | | | |
|-----------------------------|--------------------------|-------------|--------------------------|
| Car (driver) | <input type="checkbox"/> | Train | <input type="checkbox"/> |
| Car (passenger) | <input type="checkbox"/> | Underground | <input type="checkbox"/> |
| Bus | <input type="checkbox"/> | Bicycle | <input type="checkbox"/> |
| Walk | <input type="checkbox"/> | Motorbike | <input type="checkbox"/> |
| Other (please specify)..... | | | |

2. Did joining Xxxxxxx mean you **no longer** do any of the following **which you did previously?** (please tick as many boxes as apply):

- | | |
|--|--------------------------|
| Take children to/from school | <input type="checkbox"/> |
| Do shopping/other errands | <input type="checkbox"/> |
| Give someone else a lift to their work | <input type="checkbox"/> |
| Other (please specify)..... | |
| No changes | <input type="checkbox"/> |

3. Did joining Xxxxxxx mean you **now** do any of the following which you could **not do previously?** (please tick as many boxes as apply):

- | | |
|--|--------------------------|
| Take children to/from school | <input type="checkbox"/> |
| Do shopping/other errands | <input type="checkbox"/> |
| Give someone else a lift to their work | <input type="checkbox"/> |
| Other (please specify)..... | |
| No changes | <input type="checkbox"/> |

If you have started driving a car for all or part of your journey to work since you joined the Xxxxxxx Group, please go on to the next question. If you have not start driving a car to work since you joined Xxxxxxx, please go to question 5.

4. Does using a car? (please tick one box):

Have no consequences ☐

Mean someone else could do longer use that car
who previously used it regularly ☐

Mean you bought the car especially ☐

Result in anything else (please specify).....
.....
.....
.....

5. There is a proposal to build a railway station beside Cambuslang Investment Park about 3-400 yards from the Xxxxxxx Group. This would be on the line which currently runs from Glasgow Central to Carmyle. The current Standard Day Return fare from Glasgow Central to Carmyle is £2.30, although zone cards etc. could be used; the train takes 10 minutes and runs every half hour. **Do you think you would use the train to get to work if this station was built?**

I already use the train ☐

Yes, I think I would use the train ☐

No, I do not think I would use the train ☐

Part 2. Your Job

This part of the questionnaire asks you about your job and how you found out about the vacancy.

6. At what date did you first start employment with Xxxxxxx?

Month.....

Year.....

7. When you joined Xxxxxxx, how did you find out about the vacancy?

Job Centre	<input type="checkbox"/>	Word of mouth	<input type="checkbox"/>
Newspaper	<input type="checkbox"/>	Trade magazine	<input type="checkbox"/>
Speculative inquiry	<input type="checkbox"/>		
Other (please specify).....			

8. What is your current job title?.....

9. Have you ever considered leaving Xxxxxxx, for **any** reason? (please tick the appropriate box)

Yes ☐ No ☐

If no, please go to question 11. If yes, please go on to the next question.

10. What are/were the reasons for this?

Please select up to 3 in order of importance, indicating your 1st, 2nd and 3rd choices by writing in 1, 2, and 3 below.

to care for relatives	<input type="checkbox"/>	better conditions elsewhere	<input type="checkbox"/>
better pay elsewhere	<input type="checkbox"/>	difficult journey to work	<input type="checkbox"/>
unsuitable shifts	<input type="checkbox"/>	change of career/job type	<input type="checkbox"/>
job insecurity	<input type="checkbox"/>		
thinking about leaving the Glasgow area			<input type="checkbox"/>
other (please specify).....			<input type="checkbox"/>

Part 3. Your Home

This part of the questionnaire asks you about your home and any changes to where you live you considered or actually made as a result of taking your job with Xxxxxxx.

11. Is your current home? (please tick the appropriate box):

- | | |
|-----------------------------------|--------------------------|
| Rented from a local authority | <input type="checkbox"/> |
| Rented from a Housing Association | <input type="checkbox"/> |
| Rented from Scottish Homes | <input type="checkbox"/> |
| Rented from a private landlord | <input type="checkbox"/> |
| Owner Occupied | <input type="checkbox"/> |

12. What is your current full postcode (e.g. G42 8RY).

This shall be used to calculate the distance you travel to work.

Postcode

--	--	--	--	--	--	--

13. Do you (please tick as many as are appropriate):

- | | |
|---|--------------------------|
| Live with your wife/husband/partner | <input type="checkbox"/> |
| Live with your parents or guardians | <input type="checkbox"/> |
| Live on your own | <input type="checkbox"/> |
| Live in shared accommodation | <input type="checkbox"/> |
| Have people in your household who are dependent on you (e.g. elderly relatives) | <input type="checkbox"/> |
| Live in the same house as your children who are under 18 | <input type="checkbox"/> |

14. Please enter in the table below information about people in your household **who work** in the table below. Do not include yourself in the table.

	Person 1	Person 2	Person 3	Person 4
Relationship to you				
Job Title				
Are they the main wage earner for the household budget? (please delete as appropriate)	Yes / No	Yes / No	Yes / No	Yes / No
Name and address of where they work. Please provide the postcode if known.				
	<div style="border: 1px solid black; display: flex; justify-content: space-between; padding: 2px;"> </div>	<div style="border: 1px solid black; display: flex; justify-content: space-between; padding: 2px;"> </div>	<div style="border: 1px solid black; display: flex; justify-content: space-between; padding: 2px;"> </div>	<div style="border: 1px solid black; display: flex; justify-content: space-between; padding: 2px;"> </div>

15. Have you considered moving house to be closer to Cambuslang?

Yes ☐

No ☐

16. Have you moved house since you started work with Xxxxxxx?

Yes ☐

No ☐

If no, please go to question 22. If yes, please go on to the next question.

17. Was your previous home? **(please tick the appropriate box):**

- Rented from a local authority ☐
- Rented from a Housing Association ☐
- Rented from Scottish Homes ☐
- Rented from a private landlord ☐
- Owner Occupied ☐

18. What was your previous full postcode (e.g. G42 8RY)?

This shall be used to calculate the distance you travelled to work.

Postcode

If you cannot remember, please write down your previous address:

House/Flat number
Street
Town

19. Did you in your **previous** home
(please tick as many as are appropriate):

- Live with your wife/husband/partner ☐
- Live with your parents or guardians ☐
- Live on your own ☐
- Live in shared accommodation ☐
- Have people in your household who
are dependent on you (e.g. elderly relatives) ☐
- Live in the same house as your
children who are under 18 ☐

20. Please enter in the table below information about people in your **previous** household **who worked**. If this is the same as before you moved house, just leave this table blank. Do not include yourself in this table.

However, if **any** of these details have changed, then please complete the **whole** table again. Examples may include you moving in with your partner, your son/daughter leaving home, your husband/wife's job changing, etc. You can write "as before" for any particular person whose information has **not** changed.

	Person 1	Person 2	Person 3	Person 4
Relationship to you				
Job Title				
Were they the main wage earner for the household budget? (please delete as appropriate)	Yes / No	Yes / No	Yes / No	Yes / No
Name and address of where they worked. Please provide the postcode if known.	<div style="border: 1px solid black; width: 100px; height: 20px; margin: 5px 0;"></div> <div style="border: 1px solid black; width: 100px; height: 20px; margin: 5px 0;"></div>	<div style="border: 1px solid black; width: 100px; height: 20px; margin: 5px 0;"></div> <div style="border: 1px solid black; width: 100px; height: 20px; margin: 5px 0;"></div>	<div style="border: 1px solid black; width: 100px; height: 20px; margin: 5px 0;"></div> <div style="border: 1px solid black; width: 100px; height: 20px; margin: 5px 0;"></div>	<div style="border: 1px solid black; width: 100px; height: 20px; margin: 5px 0;"></div> <div style="border: 1px solid black; width: 100px; height: 20px; margin: 5px 0;"></div>

21. What factors influenced your decision to move house?

Please select up to 3 in order of importance, indicating your 1st, 2nd and 3rd choices by writing in 1, 2, and 3 below.

- | | |
|---|--------------------------|
| change household circumstances | <input type="checkbox"/> |
| to shorter your, or someone else's, journey to work | <input type="checkbox"/> |
| to be closer to public transport | <input type="checkbox"/> |
| wanted a different size/type of house | <input type="checkbox"/> |
| to own your own home | <input type="checkbox"/> |
| wanted a better quality house | <input type="checkbox"/> |
| to live in a better area | <input type="checkbox"/> |
| to be closer to shops/services | <input type="checkbox"/> |
| to be closer relatives/friends | <input type="checkbox"/> |
| to be closer to good schools | <input type="checkbox"/> |
| wanted a garden | <input type="checkbox"/> |
| other (please specify)..... | <input type="checkbox"/> |
| | |

Part 4: Yourself

22. Are you: Male ☐ Female ☐

23. What is your age? (please tick the appropriate box)

under 20	<input type="checkbox"/>	40 - 44	<input type="checkbox"/>
20 - 24	<input type="checkbox"/>	45 - 49	<input type="checkbox"/>
25 - 29	<input type="checkbox"/>	50 - 54	<input type="checkbox"/>
30 - 34	<input type="checkbox"/>	55 - 59	<input type="checkbox"/>
35 - 39	<input type="checkbox"/>	over 59	<input type="checkbox"/>

24. What is your total **annual** income from your job at Xxxxxxx **before** tax? (please tick the appropriate box):

less than £5 000	<input type="checkbox"/>	£12 500 - £14 999	<input type="checkbox"/>
£5 000 - £7 499	<input type="checkbox"/>	£15 000 - £19 999	<input type="checkbox"/>
£7 500 - £9 999	<input type="checkbox"/>	£20 000 - £24 999	<input type="checkbox"/>
£10 000 - £12 499	<input type="checkbox"/>	greater than £25 000	<input type="checkbox"/>

25. What is your total **annual** combined **household** income, including state benefits, interest on savings, returns from investments etc, **before** tax? (please tick the appropriate box)

less than £5 000	<input type="checkbox"/>	£25 000 - £29 999	<input type="checkbox"/>
£5 000 - £7 499	<input type="checkbox"/>	£30 000 - £34 999	<input type="checkbox"/>
£7 500 - £9 999	<input type="checkbox"/>	£35 000 - £39 999	<input type="checkbox"/>
£10 000 - £12 499	<input type="checkbox"/>	£40 000 - £44 999	<input type="checkbox"/>
£12 500 - £14 999	<input type="checkbox"/>	£45 000 - £49 999	<input type="checkbox"/>
£15 000 - £19 999	<input type="checkbox"/>	£50 000 - £54 999	<input type="checkbox"/>
£20 000 - £24 999	<input type="checkbox"/>	greater than £55 000	<input type="checkbox"/>

If you made significant changes to your travel arrangements as a result of joining the Xxxxxxx Group, or considered or actually did move house, I would be very interested to have a brief chat with you about the options you considered in more detail. You shall not be asked anything that is not of direct relevance to the questions in this questionnaire. This shall be very informal and take about 10-15 minutes of your work time - the Xxxxxxx Group have agreed to this. I would stress that this would be treated in the strictest of confidence, and you would not be named nor identifiable in any other way to anyone, including your employer.

If you are happy to have a short chat with me about some of your answers to this questionnaire, please write down your details below, so you can be contacted at work:

Name.....

Dept/Section.....

Please put this in the freepost envelope provided and either:

- a) Put it in the post
- b) Place it in one of the collection boxes at the Xxxxxxx Group. These are located at Dispatch, the Factory Office and the Wages Office.

THANK YOU VERY MUCH FOR YOUR TIME

Background Interview Schedule (Management)

Explain the purpose of the study:

- find out about the reasons that firms relocate
- assess the barriers workers face to commuting and migrating, by analysing the number of workers who leave their job and those who move house in response to their workplace moving
- find out about the recruitment catchment of different types of firms
 - stress that this is from a public policy point of view, and is not intended to judge firms' behaviour in any way
- stress confidentiality
- offer a study for them e.g. delimit their workforce and/or recruitment catchment; analysis of staff turnover. Ask what they would be interested in having done.

Explain the structure of questions in this interview

- Background information about the firm
- Reasons for this firm's relocation
- Find out about geographical coverage of recruitment
- Find out about changes in manning levels and skills requirement changes that accompanied the move, as these may have led to a change in staff turnover.
- Find out about incentives offered to workers to stay with the firm, as these may also have changed staff turnover independently of the move of workers' jobs

Questions

1. Background information about the firm

Could you describe the business carried out at this premises?

If different, could you describe the business carried out at the previous premises?

Is this the sole premises of the company?

If not, how much scope is there for employees to transfer between them?

Is shift work carried out here?

If so, how are they allocated?

2. Reasons for relocation

When was the decision to move made?

When were the employees notified?

When did the firm actually move?

If staged, when did how many of which jobs moved when?

What were the main reasons for the firm's relocation?

Probe.....

Is the new location your first choice?

3. Changes to the jobs carried out at the firm that accompanied the relocation

Did the product or production method/technology change when the new site was moved to?

If some jobs had minor changes, would workers be able to do the new job satisfactorily within a reasonably short period of time?

Was there retraining offered?

4. Incentives offered for workers to stay with the firm

Were there any attempts made to retain workers after the move?

Do you think staff turnover increased as a direct result of the move?

What else influences staff turnover? e.g. national recession, morale

5. Geographical coverage of recruitment

What are your main means of recruitment?

Probe.....

What positions do you have trouble filling?

Probe.....

Employee Interview Schedule

Tell me about the job you do at the moment.

Is it easy to get this type of work?

Have you always done this type of work?

Are you happy in your job? What do you like about it?

What was your first reaction when you hear xxx was to move to yyy? (*if not a new recruit*)

What would be the furthest you could reasonably travel to work?

Have you looked for a new job recently? If so:

How did/do you find out about vacancies?

Why do you think it was/is difficult to secure a job?

Would you like to live closer to work? What stops you?

If moved house recently:

Where did you move to and where from?

Why did you want to move?

Did you get a house where you wanted?

What other places did you consider?

What attracted you to where you live now?

Investigate specific responses in the questionnaire.

Leaver Interview Schedule

What was your first reaction when you heard xxx was to move to yyy?

How easy was(would) the journey to the new site (have been) for you?

Tell me about the job you did at xxx.

Were you happy at xxx? What did you like and/or dislike about it?

Tell me about the job you do at the moment.

Is it easy to get this type of work?

Have you always done this type of work?

What would be the furthest you could reasonably travel to work?

Have you looked for a new job recently? If so:

How did/do you find out about vacancies?

Why do you think it was/is difficult to secure a job?

Would you like to live closer to work? What stops you?

Investigate specific responses in the questionnaire.

